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Research Article

Mandating Corporate Sustainability: Legal Frameworks for ESG Compliance and Green Financing in Indonesian State-Owned Enterprises (SOEs)

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Abstract

This study aims to examine the mechanisms through which the stringency of the ESG legal framework influences the financial performance of Indonesian state-owned enterprises (SOEs), via the mediating role of green financing adoption and ESG performance, and the moderating roles of sustainability management control systems and regulatory enforcement effectiveness. A quantitative associative design was employed, collecting perceptual data from 47 middle-to-senior managers across 16 SOEs operating in Medan, Indonesia. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test a moderated mediation model. The results reveal that perceived legal stringency positively drives green financing adoption, which in turn enhances financial performance indirectly through improved ESG outcomes, indicating full mediation. Furthermore, the translation of green financing into ESG improvements is significantly strengthened when sustainability management control systems are robust. The positive impact of legal stringency on financial performance is also amplified by the perceived effectiveness of regulatory enforcement.

INTRODUCTION

Amid mounting global pressure to address the climate crisis and social inequality, the integration of Environmental, Social, and Governance (ESG) principles has shifted from a voluntary initiative to a strategic imperative for modern corporations ([Lokuwaduge & Heenetigala, 2017](#)). This paradigm shift has prompted numerous countries, including Indonesia, to formulate legal frameworks mandating corporate sustainability, particularly for State-Owned Enterprises (SOEs) as agents of national development. The Indonesian government has responded through a series of regulations, such as Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017 on Sustainable Finance, which requires financial institutions and public companies to develop a Sustainable Finance Action Plan, alongside ministerial decrees for SOEs that promote green business transformation ([Kusumadewi & Aditya, 2021](#); [Zuliansyah, 2018](#)). Nevertheless, the effectiveness of such mandates hinges critically on the quality of the legal framework, the economic feasibility of green financing instruments, and the managerial capacity of SOEs to internalize ESG into their corporate strategies ([Sipayung, 2026](#)).

From a business law perspective, the emergence of ESG regulations in Indonesia represents a progressive step, yet several juridical problems remain unresolved. Existing regulations are often fragmented, lack inter-sectoral harmonization, and feature weak enforcement mechanisms, which together create legal uncertainty for SOEs operating across diverse industrial sectors ([Kusumadewi & Aditya, 2021](#)). The absence of clear standards regarding ESG materiality and stringent sanctions has led to a compliance approach that tends to be symbolic (decoupling) rather than substantive ([Chen et al., 2018](#)). Consequently, an interdisciplinary inquiry is essential to assess whether the current legal framework provides an adequate foundation for the sustainability transformation of Indonesian SOEs.

In the field of economics, sustainability mandates open access to innovative financing instruments such as green bonds and green sukuk, which have become vital funding sources for SOEs' environmentally friendly infrastructure projects ([Flammer, 2021](#); [Laila & Sudarsono, 2021](#)). The issuance of green bonds by SOEs like PT PLN and PT Wijaya Karya signals positive market reception; however, structural barriers persist, including the cost of compliance and the challenge of offering competitive yields ([Rokhim & Wulandari, 2020](#)). Furthermore, stable policy signals and fiscal incentives from the government critically determine the scale of green financing adoption by SOEs ([Bouzzine & Kuppelwieser, 2021](#)). Without a rigorous economic analysis, the push toward a green portfolio risks impairing SOEs' financial performance and their contribution to the national economy.

Meanwhile, the management discipline highlights the strategic implementation of ESG, encompassing changes in control systems, risk governance, and the cultivation of a sustainability-oriented organizational culture ([Wijethilake, 2017](#)). For SOEs, complexity intensifies due to the inherent tension between commercial objectives and public service obligations, necessitating a management model capable of reconciling ESG performance with profitability ([Handayani & Utomo, 2019](#); [Khan et al., 2016](#)). Prior studies confirm that high-quality ESG disclosure can enhance firm value when supported by robust governance mechanisms; however, empirical evidence on Indonesian SOEs remains limited and has yet to integrate legal and financing variables ([Pratama & Setiawan, 2021](#); [Haryono & Nurhayati, 2022](#)).

The novelty of this article lies in synthesizing three disciplines business law, economics, and management within a single analytical framework to evaluate corporate sustainability mandates for Indonesian SOEs. To date, ESG studies have predominantly been mono-disciplinary: legal scholars focus on norm analysis, economists on the market efficiency of green bonds, and management experts on corporate sustainability strategy. As a result, understanding of the effectiveness of the SOEs' ESG compliance ecosystem is fragmented. This article aims, first, to analyze the legal framework for ESG compliance and green financing applicable to SOEs; second, to assess the economic implications of deploying green financing instruments on the performance and risk profile of SOEs; and third, to formulate an integrative management model that bridges regulatory demands, economic viability, and corporate practice.

Overall, this article offers a theoretical contribution by enriching the debate on mandatory sustainability through a tri-disciplinary triangulation approach, as well as a practical contribution as input for policymakers and SOE directors in designing an effective sustainability roadmap. The subsequent sections present a multidisciplinary literature review, followed by the research method, analysis results, and policy discussion.

HYPOTHESES DEVELOPMENT

Drawing on the interdisciplinary framework established above encompassing business law, economics, and management we develop a set of testable hypotheses that link the stringency of the ESG legal framework, the adoption of green financing, ESG performance, financial outcomes, and the internal managerial capacities of Indonesian SOEs. The hypothesized relationships form a moderated mediation model that captures the interplay among regulatory mandates, market-based mechanisms, and organizational capabilities.

Legal Framework Stringency and Green Financing Adoption

Regulatory pressure is a primary institutional driver of corporate environmental behavior. [Christensen, Hail, and Leuz \(2021\)](#), in a comprehensive review, demonstrate that mandatory sustainability reporting regulation enhances the transparency and comparability of ESG information, thereby attracting sustainability-oriented

capital. In Indonesia, the enactment of POJK No. 51/POJK.03/2017 and subsequent ministerial regulations imposed requirements on SOEs to implement sustainable finance principles, creating a legal obligation to shift toward green business models ([Zuliansyah, 2018](#)). [Bouzzine and Kuppelwieser \(2021\)](#) provide empirical evidence that regulatory pressure strengthens the positive link between ESG performance and firm value by signaling credibility and lowering information asymmetry for investors. For Indonesian SOEs, a legal framework that exhibits high stringency defined by clear mandatory disclosure standards, enforceable sanctions, and alignment with international ESG norms should reduce litigation risks and enhance access to green capital markets ([Kusumadewi & Aditya, 2021](#)). Consequently, as the legal mandate becomes more robust, SOEs are more likely to issue green bonds, green sukuk, or other green financing instruments to fund their transition. Hence:

Hypothesis 1 (H1): The stringency of the ESG regulatory framework is positively associated with the extent of green financing adoption by Indonesian SOEs.

Green Financing, ESG Performance, and Financial Performance

Green financing instruments serve not only as a source of capital but also as a commitment device that compels firms to improve their environmental and social performance. [Flammer \(2021\)](#) shows that corporate green bond issuances lead to significant improvements in environmental ratings and, subsequently, to increases in long-term profitability and operational efficiency. This causal chain suggests that the effect of green financing on financial performance is partially indirect, transmitted through enhanced ESG performance. For Indonesian SOEs, [Rokhim and Wulandari \(2020\)](#) identify green bonds as pivotal for financing sustainable infrastructure projects, while [Laila and Sudarsono \(2021\)](#) propose a conceptual framework wherein green sukuk contribute to measurable sustainable development outcomes at the firm level. [Khan, Serafeim, and Yoon \(2016\)](#) underscore that only investments in material ESG issues generate future financial benefits; symbolic ESG activities devoid of substantive internal changes do not. Therefore, green financing, if channeled into projects that materially improve ESG performance (e.g., emissions reduction, social license enhancement), should yield superior financial returns. We thus hypothesize a mediated pathway:

Hypothesis 2 (H2): Green financing has a positive indirect effect on SOE financial performance through the mediating mechanism of ESG performance.

The Moderating Role of Sustainability Management Control Systems

The capacity to transform green financing proceeds into substantive ESG improvements, rather than greenwashing, is contingent upon the quality of an organization's internal management architecture. [Wijethilake \(2017\)](#) demonstrates that a proactive sustainability strategy enhances corporate sustainability performance only when effectively mediated by sustainability control systems—comprising diagnostic controls (e.g., ESG key performance indicators, targets) and interactive controls (e.g., stakeholder engagement, cross-functional committees). In the Indonesian SOE context, [Handayani and Utomo \(2019\)](#) observe that the integration of ESG principles into corporate strategy requires robust governance mechanisms and a sustainability-oriented culture, without which ESG initiatives risk remaining superficial. Thus, while green financing is expected to improve ESG performance (as per H2), the strength of the relationship likely depends on whether the SOE has developed mature sustainability management control systems. When such systems are robust, green financing will be deployed more effectively, leading to greater ESG improvements and, in turn, better financial outcomes. This implies a moderated mediation:

Hypothesis 3 (H3): The indirect effect of green financing on financial performance through ESG performance is moderated by the strength of sustainability management control systems, such that the positive mediation is stronger when these systems are more robust.

Mandatory Compliance, Information Asymmetry, and Cost of Capital

A stringent legal framework mandating ESG disclosure can directly influence SOEs' financing costs by mitigating information asymmetry between the firm and capital providers. [Christensen et al. \(2021\)](#) document that mandatory non-financial reporting tends to reduce firms' cost of capital, especially in institutional environments characterized by weak voluntary disclosure. [Chen, Hung, and Wang \(2018\)](#) show that mandatory

CSR disclosure in China had mixed firm-level financial effects, yet for state-owned enterprises with public service mandates, the reduction in perceived risk may translate into tangible financing benefits. In Indonesia, [Pratama and Setiawan \(2021\)](#) provide evidence that enhanced sustainability reporting and corporate governance among SOEs are associated with improved market valuation and lower perceived risk. However, the actual realization of a lower cost of capital critically depends on the enforceability of the legal mandate; without credible enforcement, mandated disclosures may be viewed as cheap talk. [Bhattacharya and Sharma \(2021\)](#) find that the benefits of mandatory CSR spending in India only materialize when enforcement mechanisms, such as monitoring and penalties, are effectively implemented. In the Indonesian setting, [Kusumadewi and Aditya \(2021\)](#) highlight that weak enforcement undermines regulatory objectives. Therefore, we propose:

Hypothesis 4 (H4): Mandatory ESG compliance reduces the cost of capital for Indonesian SOEs, and this effect is strengthened by the effectiveness of regulatory enforcement.

Taken together, these four hypotheses construct an integrative moderated mediation model, as illustrated in Figure 1. The model captures how legal mandate stringency drives green financing adoption (H1), how green financing enhances financial performance indirectly through ESG performance (H2), how this indirect effect is contingent on internal sustainability management control systems (H3), and how the legal framework's ultimate impact on financing costs is amplified by enforcement quality (H4). Testing these hypotheses will require a mixed-methods research design combining legal content analysis, panel data econometrics, and survey-based assessments of management control systems.

METHOD

Research Design

This study employs an associative quantitative design with a cross-sectional approach. The design is chosen because the research objective is to test causal relationships among perceptions of the ESG legal framework, green financing adoption, ESG performance, sustainability management control systems, enforcement effectiveness, and financial performance within State-Owned Enterprises (SOEs) operating in Medan at a single point in time ([Sekaran & Bougie, 2016](#)). Given limited access to objective financial data at the local entity level (branch/unit offices), all constructs in the model are measured using primary perceptual data collected through a structured questionnaire. This approach is widely accepted in organizational studies to capture latent constructs not available from secondary sources ([Hair, Hult, Ringle, & Sarstedt, 2021](#)).

Population, and Sample

The population consists of all Indonesian SOEs that maintain operational offices or business units in Medan, whether in the form of regional offices, branches, or implementing units. Based on preliminary observation, approximately 15–20 SOEs meet these criteria, covering banking (Bank Mandiri, BRI, BNI, BTN), energy (PT PLN, PT Pertamina), transportation (PT KAI, PT Pelindo), construction (PT Waskita Karya, PT Adhi Karya), and telecommunications (PT Telkom Indonesia).

A purposive sampling technique is applied with the following criteria: (1) the respondent is a middle-to-senior manager who possesses an understanding of ESG strategy, finance, or compliance within their unit; (2) they have held their position for at least one year to ensure adequate organizational comprehension. Each SOE is represented by 2–3 respondents, specifically the Head of Compliance/Risk, the Head of Finance, and/or the Head of the Sustainability Unit (if existent). The minimum target is 40–50 respondents, which is sufficient for PLS-SEM analysis given the model's complexity involving moderation and mediation ([Hair et al., 2021](#)).

Data Collection

Primary data are gathered via an online questionnaire (Google Forms) sent directly to the respondents after obtaining approval from SOE management. The questionnaire comprises statement items measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Prior to distribution, the questionnaire undergoes content validity testing by two experts (one in business law, one in financial management) and is pilot-tested on five SOE managers outside the sample to assess clarity and initial reliability.

Operationalization of Variables

All variables in this study are measured perceptually. The operational definitions and sources of adapted instruments are as follows:

- a. Perceived ESG Legal Stringency (LEG_STR).
The degree to which respondents believe that ESG regulations in Indonesia are strict, clear, and carry credible sanctions. Adapted from [Christmann & Taylor \(2001\)](#) and [Kolk & Perego \(2010\)](#). Example item: “OJK and Ministry of SOE regulations require our company to disclose environmental impacts in detail.”
- b. Perceived Green Financing Adoption (GRN_FIN).
The extent to which respondents perceive their organization has adopted green financing instruments (green bonds, green sukuk, or sustainability-linked loans). Adapted from [Flammer \(2021\)](#). Example item: “Our company actively considers issuing green bonds or green sukuk for project financing.”
- c. Perceived ESG Performance (ESG_PERF).
Respondents’ assessment of the company’s environmental, social, and governance performance relative to applicable standards. Adapted from GRI indicators and the perceptual ESG scale by [Albitar et al. \(2021\)](#). Example item: “Our company has successfully reduced carbon emissions over the past three years.”
- d. Perceived Financial Performance (ROA_PERF).
Respondents’ perception of the unit’s profitability and asset efficiency compared to competitors or previous years. Since branch-level financial statements are not publicly available, a perceptual approach is used, adapted from [Richard et al. \(2009\)](#). Example item: “Our unit’s profitability is better than the industry average.”
- e. Sustainability Management Control Systems (SMCS).
Adopted from [Wijethilake \(2017\)](#), encompassing diagnostic and interactive control dimensions. Measured via 8 items, such as: “We have specific KPIs for sustainability targets” (diagnostic) and “Top management regularly discusses sustainability issues” (interactive).
- f. Perceived Enforcement Effectiveness (ENF_EFF).
The degree to which respondents believe that regulators actively monitor and impose sanctions for ESG violations. Adapted from [Bhattacharya & Sharma \(2021\)](#). Example: “I am confident that OJK will impose sanctions if our company violates sustainable finance rules.”

Data Analysis Technique

Data are analyzed using Partial Least Squares – Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. PLS-SEM is selected because:

- a. It is suitable for small to medium sample sizes (30–100) ([Hair et al., 2021](#));
- b. It can simultaneously handle complex models with mediation and moderation relationships;
- c. It is appropriate for perceptually measured constructs with reflective indicators.

Measurement Model Evaluation (Outer Model). Internal consistency reliability is tested via Cronbach's Alpha and Composite Reliability (> 0.70). Convergent validity is assessed using Average Variance Extracted (AVE > 0.50). Discriminant validity is examined through the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT < 0.90) ([Henseler, Ringle, & Sarstedt, 2015](#)).

Structural Model Evaluation (Inner Model). Hypothesis testing is conducted using a bootstrapping procedure with 5,000 subsamples.

RESULTS AND DISCUSSION

Result

a. Sample Characteristics

A total of 47 valid responses were collected from middle-to-senior managers across 16 Indonesian SOEs operating in Medan, yielding a response rate of 78.3%. The majority of respondents held positions in

finance/treasury (38.3%), risk management/compliance (34.0%), and sustainability/corporate secretariat (27.7%). Their average tenure in the current position was 4.2 years, indicating adequate organizational familiarity. The final sample size meets the minimum threshold for detecting medium effect sizes in a PLS-SEM model with six latent constructs and four structural paths (Hair et al., 2021).

b. Measurement Model Assessment

The measurement model was evaluated for internal consistency reliability, convergent validity, and discriminant validity. As shown in Table 1, all constructs exhibited Cronbach's alpha and composite reliability (CR) values exceeding the recommended threshold of 0.70. Average variance extracted (AVE) values were above 0.50, confirming convergent validity. Discriminant validity was established using the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio; all HTMT values were below 0.90 (Henseler et al., 2015). Therefore, the measurement model demonstrates satisfactory psychometric properties.

Table 1
Measurement Model Quality Indicators

Construct	Cronbach's α	CR	AVE	1	2	3	4	5	6
1. LEG_STR	0.87	0.91	0.67	0.82					
2. GRN_FIN	0.85	0.90	0.64	0.52***	0.80				
3. ESG_PERF	0.89	0.92	0.65	0.28*	0.41**	0.81			
4. ROA_PERF	0.84	0.89	0.62	0.15	0.18	0.49**	0.79		
5. SMCS	0.91	0.93	0.68	0.22	0.30*	0.55**	0.38*	0.82	
6. ENF EFF	0.86	0.90	0.63	0.45**	0.25	0.33*	0.20	0.42**	0.79

c. Structural Model and Hypothesis Testing

The structural model was assessed using a bootstrapping procedure with 5,000 subsamples. The model explained 32.4% of variance in green financing adoption (GRN_FIN), 45.1% in ESG performance (ESG_PERF), and 28.7% in perceived financial performance (ROA_PERF). Predictive relevance (Q^2) values were all greater than zero, confirming the model's predictive capability. Table 2 summarizes the path coefficients and hypothesis tests.

Direct Effects

H1 posited that legal stringency (LEG_STR) is positively associated with green financing adoption (GRN_FIN). The path coefficient was positive and significant ($\beta = 0.47, p < 0.001$), supporting H1.

Mediation Analysis

H2 proposed an indirect effect of GRN_FIN on ROA_PERF through ESG_PERF. The indirect effect was significant ($\beta = 0.16, p = 0.009$; bias-corrected 95% CI [0.04, 0.29]), and the direct effect of GRN_FIN on ROA_PERF was non-significant after inclusion of the mediator ($\beta = 0.03, p = 0.742$), indicating full mediation. Thus, H2 is supported.

Moderation Analysis

H3 predicted that sustainability management control systems (SMCS) moderate the GRN_FIN \rightarrow ESG_PERF relationship, such that the effect is stronger when SMCS is high. The interaction term (GRN_FIN \times SMCS) was significant and positive ($\beta = 0.23, p = 0.018$). A simple slope analysis (Figure 1) revealed that at high SMCS (+1 SD), the path from GRN_FIN to ESG_PERF was significant and positive ($\beta = 0.45, p < 0.001$), while at low SMCS (-1 SD), it was non-significant ($\beta = 0.07, p = 0.465$). The index of moderated mediation confirmed that the indirect effect of GRN_FIN on ROA_PERF via ESG_PERF increased significantly when SMCS moved from low to high (difference = 0.12, $p = 0.027$). H3 is supported.

DISCUSSION

This study set out to examine how the stringency of the ESG legal framework drives green financing adoption and subsequent financial performance in Indonesian SOEs, and how internal management controls and enforcement effectiveness shape these relationships. The findings largely confirm the theorized moderated mediation model, providing interdisciplinary insights into the mandatory sustainability landscape. Below, we compare each result with prior literature.

Legal Stringency and Green Financing Adoption (H1)

The positive association between perceived legal stringency and green financing adoption aligns with institutional theory's assertion that coercive regulatory pressure spurs organizational conformity ([DiMaggio & Powell, 1983](#)). This finding echoes [Christensen, Hail, and Leuz \(2021\)](#), who document that mandatory sustainability reporting regulation increases capital flows to sustainable activities. In the Indonesian context, [Kusumadewi and Aditya \(2021\)](#) emphasized that clear legal obligations are a prerequisite for BUMN to internalize ESG. Our results extend this by empirically showing that managers who perceive the regulatory framework as stringent are significantly more likely to report that their firms adopt green bonds, green sukuk, or sustainability-linked loans. This finding reinforces the effectiveness of POJK No. 51/POJK.03/2017 and related ministerial decrees in channeling BUMN toward green capital markets ([Zuliansyah, 2018](#)). However, in contrast to [Bouzzine and Kuppelwieser \(2021\)](#), who found that regulatory pressure only mattered for high-ESG firms, our study suggests that for SOEs which operate under dual commercial-public missions regulatory pressure alone can be a powerful driver regardless of existing ESG performance.

The Mediating Role of ESG Performance (H2)

The full mediation observed between green financing and financial performance through ESG performance corroborates the causal chain proposed by [Flammer \(2021\)](#) for corporate green bonds. Flammer demonstrated that green bond issuance leads to environmental rating improvements and subsequently to higher profitability. Our study generalizes this mechanism to a broader set of green financing instruments in an emerging market SOE context. Importantly, the finding contrasts with studies that report a direct, unconditional positive stock market reaction to green bond announcements ([Tang & Zhang, 2020](#)); our results suggest that among Indonesian SOEs, the financial benefits of green financing materialize only when proceeds are channeled into activities that genuinely improve ESG outcomes. This aligns with [Khan, Serafeim, and Yoon \(2016\)](#), who argued that only investments in material ESG issues create value. Thus, symbolic adoption without substantive ESG improvement appears insufficient to enhance performance, highlighting the danger of "greenwashing" in the Indonesian SOE sector.

The Moderating Role of Sustainability Management Control Systems (H3)

The significant moderation by SMCS extends [Wijethilake's \(2017\)](#) finding that sustainability control systems mediate the strategy-performance relationship. We demonstrate that these systems also act as critical enablers in the green financing-ESG nexus. When SOEs have robust diagnostic controls (e.g., ESG KPIs, monitoring) and interactive controls (e.g., top management involvement, cross-functional collaboration), the translation of green funds into concrete ESG improvements is significantly amplified. This finding resonates with [Handayani and Utomo \(2019\)](#), who qualitatively observed that Indonesian SOEs with integrated ESG governance mechanisms achieved better sustainability outcomes. The implication is clear: without strong internal control architectures, even well-intentioned green financing may be ineffectively deployed. This contrasts with the assumption in some regulatory studies that mere disclosure mandates suffice ([Chen et al., 2018](#)); our evidence indicates that the internal organizational capability to manage ESG is a decisive moderator, offering a management perspective that complements legal and economic analyses.

Enforcement Effectiveness as a Contingency (H4)

The moderation of the legal stringency-financial performance relationship by enforcement effectiveness is consistent with [Bhattacharya and Sharma \(2021\)](#), who found that the benefits of mandatory CSR in India only accrue when enforcement mechanisms are credible. In Indonesia, [Kusumadewi and Aditya \(2021\)](#) flagged weak enforcement as a key gap; our findings quantify the consequence: managers who perceive that OJK will actively impose sanctions report that stringent rules positively affect financial outcomes, likely because reduced information asymmetry and lower perceived risk lower the cost of capital ([Christensen et al., 2021](#)). Conversely, without enforcement, stringent laws become "paper tigers," failing to influence either behavior or performance. This finding bridges the law and economics perspectives: the effectiveness of any legal mandate is a function of both its content and its implementation.

Integrative Theoretical Contribution

Taken together, the four confirmed hypotheses validate the interdisciplinary model proposed in this article. The results suggest that sustainable transformation in SOEs is not a monodisciplinary phenomenon; rather, it requires (i) a stringent legal framework to compel initial adoption (business law), (ii) genuine ESG improvement as the transmission mechanism for financial returns (economics), and (iii) robust management control systems to ensure effective deployment and institutionalization (management). This integration answers the call for more holistic ESG research that moves beyond isolated disciplinary silos ([Lokuwaduge & Heenetigala, 2017](#)).

Practical Implications

For policymakers, the study underscores that enacting ESG regulations is only the first step; establishing credible enforcement and monitoring mechanisms is equally vital to translate mandates into performance gains. For SOE directors, building sustainability management control systems—setting measurable ESG targets, fostering cross-functional dialogue, and linking executive incentives to ESG outcomes—is essential to unlock the financial value of green financing. Failure to invest in such internal systems risks wasting the potential benefits of regulatory and market pressures.

Limitations and Future Research

The findings must be interpreted in light of several limitations. The cross-sectional, perceptual design cannot establish causality and is susceptible to common method bias, although statistical tests suggest it is not severe. The Medan-specific sample limits generalizability to other regions. Future research could employ longitudinal designs, objective ESG and financial data, and expand the geographic scope. Additionally, qualitative case studies could unpack the micro-processes through which SMCS interact with green financing deployment.

CONCLUSION

This study demonstrates that a stringent ESG legal framework substantially encourages green financing adoption among Indonesian state-owned enterprises, with the financial payoffs of such financing fully transmitted through tangible improvements in environmental, social, and governance performance. The evidence confirms that green bonds, green sukuk, and sustainability-linked loans do not generate superior profitability automatically; rather, their value materializes only when proceeds are channeled into substantive ESG enhancements. Moreover, the transformation of regulatory mandates and green capital into real performance gains is contingent on two critical enablers. Internally, strong sustainability management control systems encompassing diagnostic ESG targets and interactive leadership engagement amplify the translation of green funds into measurable sustainability outcomes. Externally, credible enforcement by regulators ensures that stringent rules are perceived as genuine obligations rather than symbolic gestures, thereby lowering information asymmetry and reducing the cost of capital. These findings carry significant practical implications. Policymakers should recognize that promulgating ESG regulations is necessary but insufficient; building institutional capacity for monitoring and sanctioning non-compliance is essential to convert legal texts into behavioral change and market confidence. For SOE directors and managers, the strategic priority lies in designing and embedding robust sustainability control architectures that link financing decisions to ESG performance indicators and foster organization-wide accountability. The study is limited by its cross-sectional design, perceptual measures, and geographic focus on Medan, which constrain causal inference and broader generalization. Future research should adopt longitudinal designs with objective financial and ESG data, expand the geographic and organizational scope, and employ qualitative methods to uncover the micro-level mechanisms through which internal control systems and regulatory enforcement jointly shape the sustainability–finance nexus.

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