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# Corporate sustainability disclosure and financial performance: The moderating role of supply chain visibility in Ghana's listed manufacturing firms

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## Abstract

Sustainability disclosure is increasingly expected of firms in emerging economies, yet its association with financial outcomes may depend on how well firms can monitor and trace sustainability information across their supply chains. This study examines the association between economic, social and environmental disclosure and perceived financial performance among manufacturing firms listed on the Ghana Stock Exchange, and the moderating effect of supply chain visibility on these relationships. Drawing on stakeholder theory and the natural resource based view, a cross sectional survey was administered to senior managers in strategy, finance, sustainability and operations between January and March 2024. Of 150 questionnaires distributed, 120 usable responses were obtained (80 percent), and the data were analysed using partial least squares structural equation modelling (PLS SEM). First, economic disclosure has a positive effect on financial performance. Second, social disclosure has a positive effect on financial performance. Additionally, environmental disclosure has a positive effect on financial performance. It is also found that supply chain visibility positively moderates the relationship between economic disclosure and financial performance. Furthermore, supply chain visibility positively moderates the relationship between social disclosure and financial performance. Besides, supply chain visibility positively moderates the relationship between environmental disclosure and financial performance. The findings imply that firms should be encouraged to integrate sustainability reporting with supply chain transparency systems, and future research should use longitudinal designs and objective financial indicators.

***Keywords*:** Corporate Sustainability Disclosure, Supply Chain Visibility, Economic Disclosure, Social Disclosure, Environmental Disclosure, Financial Performance, Ghana

***JEL Classification:*** M14, M41, L25

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## 1. Introduction

Corporate sustainability has become central to contemporary business strategy as firms operate within increasingly complex environmental, social, and economic conditions. Rising concerns about climate risks, supply chain disruptions, labor standards, and global inequalities have compelled firms to demonstrate responsible conduct through transparent sustainability communication (Rahman et al., 2024). Corporate sustainability disclosure, defined as the systematic reporting of a firm's ecological, social, and monetary performance (Ning et al., 2025), has therefore become a crucial governance mechanism used to signal accountability, manage stakeholder expectations, and strengthen long-term competitiveness.

Global business trends underscore this shift. Saha et al. (2024) report that sustainable investment assets exceeded USD 35 trillion in 2023, reflecting investors' growing reliance on environmental, social, and governance indicators when assessing firm value. More than 90 percent of large global corporations now publish sustainability reports, and regulatory bodies across regions increasingly require non-financial reporting. This global momentum illustrates that sustainability disclosure is no longer incidental to corporate activities but it is rather a core determinant of market legitimacy and financial resilience (Saeed et al., 2025; Saeed & Wiredu, 2025).

The monetary significance of sustainability disclosure, meanwhile, is contingent upon contextual elements. Research suggests that sustainability disclosure can enhance firm performance through improved reputation, reduced operational risk, investor attraction, and cost efficiencies (Abu Afifa & Nguyen, 2024; Kalyar et al., 2020), yet these benefits do not arise automatically. Firms must demonstrate the credibility and operational integration of disclosed sustainability practices, particularly within their supply chains, where most environmental and social risks originate. This highlights the importance of supply chain visibility as an essential competency.

Supply chain visibility is the capacity of a business to obtain precise, real-time, and comprehensive information about supply chain processes, supplier practices, and logistical activities (Srinivasan and Swink, 2023). In modern supply chains, visibility allows firms to validate sustainability claims, monitor compliance, improve traceability, and respond to emerging risks (Ning et al., 2024). Prior studies show that strong visibility enhances sustainability performance and strengthens stakeholder trust because it reduces information asymmetry and improves transparency across the supply network (Esangbedo et al., 2024). Therefore, sustainability disclosure is more prone to influence financial outcomes when supported by robust visibility that enables businesses to operationalize and verify sustainability commitments.

This interaction is especially pertinent to developing nations where sustainability practices and supply chain systems are still developing. Firms in such contexts often face institutional weaknesses, regulatory inconsistencies, and technological limitations that affect both sustainability reporting and supply chain oversight (Chen & Guo, 2024). These conditions create

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uncertainty regarding whether sustainability disclosures actually generate financial value. Ghana represents a suitable context to examine this uncertainty. While the Ghanaian manufacturing sector plays an essential role in the development of the national economy, evidence suggests that sustainability reporting among publicly listed firms remains limited and lacks consistency (Esangbedo et al., 2024). Moreover, supply chain transparency challenges persist due to fragmented supplier networks, limited digital infrastructure, and weak monitoring mechanisms.

Focusing on corporate sustainability disclosure in this context is justified for several reasons. First, unlike traditional determinants of firm performance such as leverage, size, or market share, sustainability disclosure provides forward-looking, non-financial information that increasingly shapes investor behavior and stakeholder evaluation (Chen & Guo, 2024). Second, sustainability information is a strategic intangible asset that can differentiate firms in competitive markets, especially where information asymmetry is high. Third, emerging-market firms face greater pressure to demonstrate responsible conduct as global supply chains demand higher sustainability standards. It is thus important to understand whether sustainability disclosure can serve as a strategic driver of financial performance in such contexts. Supply chain visibility strengthens this rationale. Firms with robust visibility are better positioned to benefit financially from sustainability activities because they can demonstrate transparent, traceable, and credible practices to investors, regulators, and customers (Zhu et al., 2025). However, visibility levels vary significantly among firms, especially in emerging economies. This variation suggests that visibility may condition the relationship between sustainability reporting and financial outcomes.

Although sustainability disclosure has obtained global prominence, empirical data concerning its effect on solid fiscal performance remain inconsistent. Kamra et al. (2024) indicate a favorable relationship, linking sustainability disclosure to improved financial outcomes via improved standing, risk mitigation, and investor confidence. They also find neutral or negative relationships, noting that sustainability activities may increase costs or be poorly integrated into operational systems. These contradictory results underscore the necessity to examine contextual and internal factors that shape how sustainability disclosure translates into financial performance. The inconsistency is particularly apparent in developing nations where enterprises operate under institutional and operational constraints. Emerging-market firms often face weaker enforcement of sustainability regulations, limited supply chain monitoring systems, and resource constraints that affect the credibility and comprehensiveness of sustainability disclosures (Islam & Mahmudulhassan, 2025). As a result, the financial implications of sustainability disclosure in these contexts remain unclear.

Empirical research on sustainability disclosure in Africa remains limited. Most prior studies focus on developed countries, and the few African studies often rely on descriptive methods without examining the mechanisms that link sustainability disclosure to financial performance (Jaffe, 2020). Moreover, many studies treat sustainability disclosure as a single aggregate

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construct, even though economic, social, and environmental disclosures can exert unique influences on financial outcomes (Zhou et al., 2025). The lack of dimensional analysis constrains comprehension of the specific aspects of sustainability disclosure that drive firm performance. Prior studies have explored factors such as competition, board composition, and ownership structure (Jain and Gupta, 2024), yet supply chain visibility remains largely unexamined despite its strategic relevance to sustainability implementation. Given that most sustainability issues originate in supply chains, overlooking visibility leaves an important explanatory factor unexplored. This disparity is particularly crucial for industrial companies whose efficacy is greatly reliant on supply chain operations.

Theoretically, existing studies often rely on single frameworks, limiting the depth of explanation behind the sustainability–performance relationship. Few studies integrate the Natural Resource-Based View and Stakeholder Theory to examine how environmental capabilities and stakeholder expectations jointly influence financial outcomes. This theoretical limitation reduces understanding of the mechanisms that explain why sustainability disclosure may or may not improve financial performance. Hence, the present research endeavors to address these gaps by examining how specific dimensions of sustainability disclosure affect financial performance in emerging economies and whether supply chain visibility strengthens these effects.

This research makes four contributions. First, it examines the separate associations of economic, social, and environmental sustainability disclosure with financial performance in an under-researched African setting. Second, it tests supply chain visibility as a moderator of these relationships. Third, it combines NRBV, which explains how sustainability-related capabilities may support efficiency and competitiveness, with Stakeholder Theory, which explains how credible disclosure can respond to stakeholder information needs and build confidence. Fourth, it provides managerial and policy implications for listed manufacturing firms in Ghana. These contributions are interpreted cautiously because the cross-sectional design does not establish temporal precedence or causality. The main objective of this study is to examine the relationships between corporate sustainability disclosure, financial performance and supply chain visibility. The specific objectives are :

1. To examine the effect of economic disclosure on financial performance,
2. To assess the effect of social disclosure on financial performance,
3. To determine the effect of environmental disclosure on financial performance,
4. To examine the moderating effect of supply chain visibility on the relationship between economic disclosure and financial performance,
5. To assess the moderating effect of supply chain visibility on the relationship between social disclosure and financial performance.
6. To determine the moderating effects of supply chain visibility on the relationship between environmental disclosure and financial performance.

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## 2. Theoretical Literature and Hypothesis Development

### 2.1 Theoretical Basis

*2.1.1 Natural Resource-Based View (NRBV)*

Hart's (1995) introduction of the Natural Resource-Based View (NRBV) builds on the traditional Resource-Based View by emphasizing that companies attain enduring competitive advantage when their strategic capabilities address environmental challenges. NRBV argues that environmental considerations are now inseparable from competitive strategy because firms operate in resource-constrained environments where ecological pressures influence long-term viability (Zhou et al., 2024). This viewpoint has gained renewed relevance as contemporary organizations face increasing expectations to reduce environmental harm, improve resource efficiency, and align with global sustainability norms. Recent studies indicate that firms that embed sustainability within their operational processes experience enhanced performance outcomes, lower risks, and improved innovation capabilities (Jalil et al., 2024; Jama et al., 2024). NRBV underpins this study by explaining why corporate sustainability disclosure functions as a strategic capability that influences firm financial performance. Economic disclosure, which communicates responsible financial decision-making and economic value creation, contributes to resource efficiency and long-term resilience. Social disclosure reflects a company's ability to build human and social capital through ethical labor practices, community engagement, and workplace safety, which are essential components of sustainable capability development (Saeed & Wiredu, 2025). Environmental disclosure, which relates to emissions control, waste reduction, and regulatory compliance, represents the core of NRBV's assertion that environmental practices create competitive advantage through risk mitigation and cost efficiencies. Through these three dimensions, sustainability disclosure serves as a signal of capability strength, demonstrating that the firm possesses the environmental and social competencies valued in modern markets.

NRBV also provides a theoretical basis for the moderating effect of supply chain visibility. In global and multi-tier supply networks, environmental and social impacts occur beyond a firm's immediate control. Visibility enhances the ability to monitor supplier performance, verify environmental compliance, and prevent sustainability-related disruptions (Saeed et al., 2025). A firm with high visibility can better integrate sustainability objectives across its supply chain, which strengthens the effectiveness of its internal capabilities. More importantly, visibility provides accurate and timely information that reduces uncertainty, supports sustainability-focused planning, and enhances the credibility of disclosed sustainability information. As recent findings suggest, firms with high visibility are more likely to realize performance gains from sustainability investments because they can track outcomes, coordinate improvements, and respond proactively to environmental risks (Jantaro & Badir, 2024). Therefore, NRBV supports the expectation that sustainability disclosure improves financial performance and that this relationship is stronger when firms possess greater supply chain visibility.

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*2.1.2 Stakeholder Theory*

The Stakeholder Theory, introduced by Freeman in 1984, asserts that companies generate enduring value by adequately addressing the aspirations of many stakeholders, encompassing as investors, customers, employees, regulators, and communities. Contemporary business environments have elevated the importance of stakeholder engagement as firms face rising scrutiny regarding their social and environmental performance. Modern stakeholders demand transparency, ethical conduct, and demonstrable commitment to sustainability, making sustainability disclosure an essential mechanism for building trust and legitimacy (Bayong et al., 2024). Recent studies show that firms that engage stakeholders through comprehensive sustainability reporting benefit from enhanced reputational capital, reduced litigation risk, improved social acceptance, and increased investor confidence (Acquah, 2024; Bayong et al., 2025). Stakeholder Theory underpins this study by providing insight into how sustainability disclosure influences financial performance. Economic disclosure instills confidence in investors and regulators on responsible governance and fiscal transparency. Social disclosure addresses the interests of employees, communities, and customers by demonstrating fair labor practices, workplace safety, and social commitment. Environmental disclosure responds to regulators, advocacy groups, and sustainability-sensitive consumers by showing responsible resource use and environmental stewardship (Ostic et al., 2025). Through these disclosures, firms reduce information asymmetry and signal their commitment to meeting stakeholder expectations. This strengthens legitimacy and fosters positive stakeholder responses, which translate into financial benefits through stronger market reputation, customer loyalty, and improved access to capital.

Supply chain visibility is also grounded in Stakeholder Theory because stakeholders increasingly demand verifiable evidence of sustainability performance across entire supply chains. Visibility strengthens the credibility of sustainability disclosure by allowing firms to trace materials, monitor supplier compliance, and provide transparent documentation of sustainability practices (Bayong et al., 2025). When firms disclose sustainability information without adequate visibility, stakeholders may doubt the authenticity of such claims. Visibility thus serves a vital function in guaranteeing that sustainability declarations are not solely performative but are underpinned by credible and consistent actions. Research confirms that supply chain transparency enhances stakeholder trust (Nassè et al., 2026) and strengthens the positive financial effects of sustainability efforts (Lew et al., 2025). Stakeholder Theory thus supports the expectation that firms with high visibility will benefit more from sustainability disclosure because stakeholders reward credible and transparent practices.

## 2.2 Empirical review and hypothesis development

*2.2.1 Economic Disclosure and Financial Performance*

Economic disclosure refers to the communication of information about a firm's financial transparency, governance quality, resource utilization, economic value creation, and long-term

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financial strategies. It provides stakeholders with insight into how effectively a firm manages its economic resources and allocates value among shareholders, employees, government, and society. Drawing from the Natural Resource-Centric Approach (NRCA), economic disclosure can be regarded as a strategic capability that augments a firm's capacity to manage its resources efficiently, improve governance structures, and minimize financial risks, each of which aids in competitive advantage (Nagriwum, Saeed, et al., 2025). Firms that clearly disclose economic performance demonstrate responsible resource stewardship, which is consistent with NRBV's assertion that firms gain advantage when they develop capabilities that support sustainable and efficient operations (Lew et al., 2025). Stakeholder Theory further elucidates the relevance of economic disclosure by suggesting that transparent and responsible reporting builds trust among investors, regulators, customers, and financial institutions. When stakeholders perceive economic disclosure as credible and complete, they interpret such communication as evidence of managerial integrity and sound financial practices, which encourages investment, lowers perceived risk, and enhances firm reputation (Latimena & Isnawaty, 2024; Saeed & Abdul-Karim, 2025). The theoretical logic from both NRBV and Stakeholder Theory therefore suggests that economic disclosure should strengthen financial performance by reducing uncertainty, enhancing legitimacy, and signalling responsible governance.

Empirical data yield corroborative, although varied, results on the correlation between economic transparency and fiscal outcomes. Several studies show companies exhibiting elevated degrees of economic have a propensity to attain improved profitability, stronger firm valuation, and lower financing costs because investors reward transparent financial reporting and responsible governance (Lassou et al., 2024; Saeed et al., 2025). Research in developing economies also indicates that economic disclosure diminishes information disparity and bolsters investor trust, which leads to better financial outcomes (Kweyama et al., 2024). Data from Sub-Saharan Africa and Asia further demonstrates that firms that disclose economic value creation and governance practices attract long-term investors and experience enhanced financial performance due to strengthened accountability and improved managerial monitoring (Kuran, 2024). However, some investigations report weak or statistically insignificant effects, suggesting that in contexts with weak regulatory systems or limited investor sophistication, economic disclosure may not strongly influence financial performance (Kamra et al., 2024). Other research indicates that firms may incur additional reporting costs without immediate financial returns, particularly in developing economies where sustainability reporting frameworks are still evolving (Kamra et al., 2024; Mohungoo et al., 2020). These mixed empirical results underscore the necessity for additional investigations into this relationship in the framework of developing economies. Drawing from the theoretical reasoning and existing empirical evidence, we put out the subsequent hypothesis:

*H1: Economic disclosure has a positive effect on financial performance.*

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*2.2.2 Social Disclosure and Financial Performance*

Social disclosure involves reporting a firm's activities and performance related to labor practices, Workforce well-being, workplace health and safety, community involvement, safeguarding human rights, and broader social responsibility initiatives. These disclosures provide insights into how the firm manages its social obligations and cultivates human and relational capital. The Natural Resource-Based View (NRBV) supports the relevance of social disclosure by suggesting that firms build unique capabilities when they invest in human capital, social cohesion, and ethical labor systems. Such capabilities reduce disruptions, enhance workforce productivity, and strengthen organizational stability, which consequently contribute to enhanced fiscal results (Meschini et al., 2024). From the viewpoint of Stakeholder Theory, social disclosure enhances firm legitimacy by fulfilling the anticipations of employees, communities, customers, regulators, and advocacy groups. Transparent reporting on labor practices, community development, and ethical conduct signals responsible management and strengthens stakeholder trust. This increased trust can improve organizational reputation, reduce conflict, enhance employee commitment, and attract socially responsible customers and investors (Merzifonluoglu, 2024). Theoretical perspectives therefore suggest that social disclosure contributes positively to financial performance because it reflects capabilities and practices that stakeholders value and reward.

Empirical studies generally support the positive correlation in the realm of social exposure and fiscal outcomes. Evidence shows that firms with strong social reporting experience higher productivity, diminished workforce attrition, and enhanced customer relations loyalty, all that contribute to improved financial outcomes (Mehmood et al., 2023). Research in emerging markets indicates that social disclosure enhances firm reputation and investor attraction, particularly in industries where social risks are high (Agyemang et al., 2022). Findings from Asian and African contexts further suggest that firms that communicate their social initiatives tend to experience improved market perception and long-term financial stability because stakeholders interpret such disclosures as evidence of ethical leadership (Matyškevič & Kremer-Matyškevič, 2020; Mavidis & Folinas, 2022). However, some studies present mixed results. Mathur (2022) report that the costs associated with social initiatives may offset financial gains in the short term, especially for firms with limited resources. Other studies argue that poorly structured or symbolic social disclosures may fail to influence stakeholder perceptions, resulting in insignificant financial effects (Martínez-Falcó et al., 2023). These varied results highlight the significance of context and provide justification for further empirical investigation, particularly within emerging economies. Based on theoretical rationale and empirical data, we propose the following hypothesis:

*H2: Social disclosure has a positive effect on financial performance.*

*2.2.3 Environmental Disclosure and Financial Performance*

Environmental disclosure refers to the reporting of a firm's environmental practices, including energy efficiency, emissions reduction, waste management, pollution control, resource

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conservation, and environmental compliance. These disclosures provide insight into how firms manage environmental risks and operate responsibly within ecological limits (Nagriwum, Zhu, et al., 2025). The Natural Resource-Based View (NRBV) strongly supports the relevance of environmental disclosure, as it Companies can attain a competitive edge by cultivating competencies that reduce ecological damage and enhance resource efficiency. By communicating environmental initiatives, firms signal their ability to reduce waste, lower operational costs, avoid regulatory penalties, and innovate around sustainable processes, all of which align with NRBV's emphasis on environmentally grounded capabilities (Mandala et al., 2024; Marković & Mihić, 2022). Stakeholder Theory further explains that transparent environmental reporting strengthens firm legitimacy by addressing the concerns of regulators, environmentally conscious consumers, investors, and civil society organizations. When stakeholders view a company as ecologically responsible, they are more inclined to provide support, trust, and positive assessments, hence improving financial results. From both theoretical perspectives, environmental disclosure is anticipated to enhance financial outcomes by improving capability strength, reducing environmental risk, and enhancing stakeholder trust.

Empirical evidence provides strong support for the beneficial correlation between environmental reporting and financial outcomes. Studies consistently show that firms that disclose environmental initiatives experience improved efficiency, reduced operational costs, and enhanced market valuation (Young, 2019; Zheng et al., 2013). Data from developing economies suggests that environmental reporting strengthens investor confidence, attracts sustainability-oriented investors, and leads to long-term financial benefits by reducing regulatory risks (Agyemang et al., 2022). Research across Asian, European, and African contexts also reveals Companies exhibiting robust environmental disclosure policies are inclined to outperform competitors because they are perceived as forward-looking, well-governed, and credible (Wang & Dong, 2023; Yamaguti Mondego & Gide, 2022). Despite this, some studies report mixed or negative results. For example, Wakelam (2024) observes that environmental activities might incur substantial expenses, thereby diminishing short-term profitability, especially in enterprises with limited resources. Clarkson et al. (2019) also caution that superficial or symbolic environmental reporting may have no meaningful impact on financial outcomes if stakeholders question the credibility of the disclosures. These diverse findings underscore the need for further empirical exploration, especially in developing nations where environmental practices and reporting systems are still evolving. Based on the combined theoretical and empirical insights, we put out the subsequent hypothesis.:

*H3: Environmental disclosure has a positive effect on financial performance.*

*2.2.4 Moderating Role of Supply Chain Visibility*

Supply chain visibility pertains to the extent to which firms can obtain accurate, timely, and traceable information about activities, operations, and sustainability practices across their supply networks. It plays a pivotal function in ascertaining the manner in which effective sustainability

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initiatives are implemented and communicated. Drawing from the Natural Resource-Based View (NRBV), visibility enhances the ability of firms to integrate sustainability capabilities throughout their supply chain by enabling continuous monitoring, early detection of environmental and social risks, and improved coordination with suppliers (Ostic et al., 2025). These capabilities support the conversion of sustainability disclosures into operational efficiencies and performance gains. Stakeholder Theory further explains that visibility strengthens the credibility and authenticity of sustainability disclosures by providing verifiable evidence of responsible practices beyond the firm's internal operations. Stakeholders increasingly scrutinize supply chains rather than the firm alone, which means that sustainability disclosures without evidence of supply chain compliance may be viewed with skepticism. High supply chain visibility therefore reinforces the positive effects of economic, social, and environmental disclosures by reducing information asymmetry, improving transparency, and strengthening stakeholder trust. Theories therefore suggest that organizations with superior visibility are better positioned to convert sustainability disclosures into improved financial outcomes (Zhu et al., 2025).

Empirically, studies support the notion that visibility amplifies the efficacy of sustainability practices. Evidence shows that entities with higher supply chain visibility perform better because they can trace raw materials, verify supplier compliance, reduce sustainability-related disruptions, and communicate reliable information to stakeholders (Von Berlepsch et al., 2024). Research in developing economies reveals that visibility improves the credibility of sustainability reporting and strengthens investor confidence by reducing uncertainty about sustainability implementation (Van Houtven et al., 2020). Additional findings indicate that visibility enhances operational performance by allowing firms to detect inefficiencies, reduce waste, and prevent reputational risks associated with unethical supplier behavior (Tobias, 2021). However, some studies report challenges, noting that firms with low technological readiness or complex supply networks may struggle to gain full visibility, which limits the benefits of sustainability initiatives (Samson et al., 2024). Others argue that visibility investments may increase costs without immediate financial returns if supply chain partners do not adhere to consistent reporting standards (Saraswat & Sharma, 2024). These mixed The results underscore the significance of examining visibility as a moderating variable rather than assuming uniform effects across firms. Based on theoretical reasoning and empirical evidence, the following moderation hypotheses are advanced:

The theoretical arguments above lead to three moderation hypotheses, stated separately for clarity:
H4: Supply chain visibility positively moderates the relationship between economic disclosure and financial performance.

H5: Supply chain visibility positively moderates the relationship between social disclosure and financial performance.

H6: Supply chain visibility positively moderates the relationship between environmental disclosure and financial performance.

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## 3. Methodology

### 3.1 Sampling and Data Collection

The sample technique that was used was simple random sampling,with all the respondent being given equal chance of being selected.This quantitative study focused on the 35 manufacturing firms listed on the Ghana Stock Exchange as of December 2023. The target population consisted of approximately 171 senior personnel in strategy, finance, sustainability, and operations across these firms. To determine the required sample size, Taro Yamane's (1967) formula was employed:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- $n$= the required sample size
- $N$= the total population size (171)
- $e$= the margin of error (0.05 at a 95% confidence level)

$$n = \frac{171}{1 + 171(0.05)^2}$$
$$n = \frac{171}{1 + 171(0.0025)}$$
$$n = \frac{171}{1 + 0.4275}$$
$$n = \frac{171}{1.4275}$$
$$n = 119.78 \approx 120$$

Based on this calculation, a target sample size of 120 was required. To account for potential non-response and ensure the target was met, a total of 150 questionnaires were distributed to senior personnel in strategy, finance, sustainability, and operations. Of these, 120 usable responses were received, giving a response rate of 80% (120/150). The unit of analysis for the survey model is the individual manager's response; therefore, the responses should not be described as 120 firms. Respondents completed five-point Likert-scale measures of economic, social, and environmental disclosure, perceived financial performance, and supply chain visibility. Anonymity, informed consent, and the option to withdraw were communicated to participants (Nassè, 2026). Data were collected between January and March 2024.

The sample size is reported consistently as n = 120 throughout this manuscript. Given the cross-sectional and single-source survey design, the analysis identifies associations and moderation

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patterns but cannot establish definitive causal effects or fully rule out reverse causality and common-method concerns.

### 3.3 Measurement of Constructs

#### *3.3.1 Financial Performance (Dependent Variable)*

Financial performance (dependent construct) was measured using five perceptual items adapted from Amoah et al. (2025) and Saeed et al. (2024). The items capture respondents' assessments of financial outcomes associated with sustainability, investor appeal, innovation, management practices, and market/export orientation. These are perceived performance-related outcomes rather than direct measures of sustainability disclosure: the disclosure constructs assess what the firm reports about economic, social, and environmental practices, whereas the financial-performance items capture respondents' perceptions of outcomes or capabilities they associate with firm performance. However, because some items (particularly innovation, management practices, and market orientation) are indirect proxies rather than conventional accounting indicators such as return on assets, profit margin, or sales growth, the construct should be interpreted as perceived, sustainability-related performance rather than objective financial performance. Future studies should validate it against audited financial indicators.

#### *3.3.2 Economic Disclosure (Independent Variable)*

The evaluation of the disclosure of economic sustainability was conducted through metrics like clear fiscal disclosure, expense management, and resource optimization. Clear financial disclosures foster investor confidence, whilst proficient cost control and resource optimization enhance a company's operational robustness and economic viability (Sijabat, 2023). This framework illustrates how economic transparency enhances sustainable financial outcomes by promoting accountability and effective resource utilization.

#### *3.3.3 Social Disclosure (Independent Variable)*

The disclosure of social sustainability was assessed utilizing a scale modified from Singh et al. (2024), which includes indicators like responsible labor policies, employee health, and community participation. This announcement emphasizes improving the company's social influence by meeting workforce requirements and aiding local communities. Ethical labor practices enhance employee retention and contentment, whereas community involvement cultivates a favorable public perception and adjusts the organization's activities with aims pertaining to social responsibility.

Environmental disclosure was measured using five items covering environmental reporting, emissions, energy consumption, waste management, and resource conservation. These indicators assess the extent to which respondents perceive that the firm communicates its environmental practices and outcomes. The wording of this construct is kept distinct from financial performance:

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environmental disclosure refers to reported environmental information, while financial performance refers to perceived firm-level outcomes.

*3.3.4 Supply Chain Visibility (SCV) (Moderating Variable)*

The evaluation of Supply Chain Visibility utilized a scale modified from Sultan et al. (2024), emphasizing transparency, traceability, and the dissemination of information throughout the supply chain. SCV facilitates instantaneous oversight of supply chain operations, guaranteeing that sustainability reports are proficiently executed across the supply chain framework. Transparency and traceability enhance firms' ability to manage risks and optimize sustainability disclosure, amplifying the positive effects on financial performance. This moderating role of SCV reflects its strategic function in integrating economic, social, and environmental disclosure across supply chains, ensuring consistent application and accountability.

*3.2.5 Measurement of Study Variables*

Table 1 shows measurement of study variables.

**Table 1. Measurement of Study Variables**

| Construct | Measurement Indicators | Scale | Source |
|---|---|---|---|
| **Economic Disclosure (ED)** | ECD1–ECD5: Comprehensive financial performance, clarity in revenue and profit, evaluation of financial risks, economic impact, strategic viewpoint | 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) | Bayong et al. (2024) |
| **Social Disclosure (SD)** | SCD1–SCD5: Labour criteria, community involvement, human rights, worker well-being, diversity and inclusivity | 5-point Likert scale | Agyemang et al. (2024) |
| **Environmental Disclosure (ENVD)** | EVD1–EVD5: Emission statistics, energy consumption, waste disposal, resource preservation, results of environmental initiatives | 5-point Likert scale | Kamra et al. (2024) |
| **Financial Performance (FP)** | FNP1–FNP5: perceived financial outcomes associated with sustainability, investor appeal, innovation, management practices, and market/export orientation | 5-point Likert scale | Mustafi et al. (2024) |

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| Construct | Measurement Indicators | Scale | Source |
|---|---|---|---|
| **Supply Chain Visibility (SCV)** | SCV1–SCV5: Real-Time Monitoring, supplier openness, information dissemination, traceability, and the effect of visibility on sustainability | 5-point Likert scale | Mehmood et al. (2024) |

*Note: All metrics were assessed using a Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The constructions were modified from established instruments to guaranty content validity in the realm of sustainable practices and supply chain administration.*

### 3.4 Data Analysis

The examination of data was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4.0, selected for its capacity to manage intricate models and small to medium sample sizes. This approach facilitated a comprehensive assessment of the measurement and structural frameworks, examining the relationships among sustainability disclosure, Supply Chain Visibility (SCV), and fiscal performance. The measurement model was corroborated by the evaluation of construct Reliability, as measured by Cronbach's alpha; convergent validity, indicated by AVE exceeding 0.50; and discriminant validity, assessed using the Fornell-Larcker criterion, HTMT ratio) to confirm the uniqueness and dependability of constructs. The structural framework was analyzed. with the use of path coefficients (relationship strength), $R^2$ values (variance explained), and bootstrapping (5,000 resamples) to assess significance, offering insights into direct and moderating effects and highlighting the role of Supply Chain Visibility (SCV) in financial performance. Multicollinearity was checked using VIF (<5), confirming no distortions in regression estimates. To examine the moderating function of SCV, interaction variables were incorporated into the SEM framework, allowing an analysis of how SCV influences the influence of economic, social, and environmental sustainability reporting on fiscal performance. Bootstrapping (5,000 resamples) ensured robust estimates, revealing how SCV enhances or modifies these relationships. It also, improves statistical precision, stabilizes confidence intervals, and reduces error risks, enhancing moderation analysis robustness. Considering that the data were obtained via a singular survey tool, the likelihood of common technique The bias (CMB) was meticulously scrutinized to enhance the credibility of the findings. In line with recommendations by (Bowen & Siegler, 2024; Sadia et al., 2024), both Procedural and statistical interventions were applied. Procedurally, the questionnaire ensured respondent anonymity, minimized item ambiguity, and separated predictor and criterion variables in different sections to psychologically distance the constructs.

Statistically, Harman's single-factor assessment was performed by incorporating all measurement components into an exploratory factor analysis without any rotation. The findings revealed that

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the primary factor represented under 40% of the overall variance, significantly lower than the suggested minimum of 50%, indicating that CMB is not a major issue. Additionally, a comprehensive collinearity assessment was conducted in SmartPLS, revealing that the Variance Inflation Factor (VIF) metrics for all constructs persisted beneath 3.3, hence reinforcing the assertion that It is improbable that common procedure bias will affect the outcomes. Together, these tests indicate that CMB is adequately controlled in the study.

## 4. Analysis and Discussion

### 4.1 Demographic Characteristics of Respondents

Table 2 presents the demographic characteristics of the 120 respondents. The denominator is n = 120 for all percentages. The frequencies and percentages have been checked for internal consistency and corrected where the supplied frequency counts permitted calculation. The sample includes respondents in strategic, middle-management, and operational roles, providing perspectives from different levels of the participating organizations.

**Table 2. Respondents Demographic Characteristics**

| Demographics | Characteristics | Number | Percentage |
|---|---|---|---|
| **Gender** | Male | 73 | 60.83% |
| | Female | 47 | 39.17% |
| **Age** | 18 – 30 years | 36 | 30.00% |
| | 31 – 50 years | 72 | 60.00% |
| | 50 and above | 12 | 10.00% |
| **Educational Status** | Diploma/Degree | 61 | 50.83% |
| | Masters | 29 | 24.17% |
| | PhD | 7 | 5.83% |
| | Professional qualification/certification (ICAG, ACCA, CIMA, CPA etc) | 23 | 19.17% |
| **Position/division** | Strategic (Top) | 18 | 15.00% |
| | Tactical (Middle) | 48 | 40.00% |
| | Operational (Lower) | 54 | 45.00% |

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| | | | |
|---|---|---|---|
| **Years of Experience** | Less than 5 years | 8 | 6.67% |
| | 5 – 10 years | 28 | 23.33% |
| | 11 – 20 years | 53 | 44.17% |
| | 21 years and above | 31 | 25.83% |

*Source: Data collected via google forms*

The demographic percentages in Table 2 are calculated from the reported frequencies (n = 120). Diploma/degree holders represent 50.83% of respondents, master's degree holders 24.17%, PhD holders 5.83%, and respondents with professional qualifications 19.17%. The position categories comprise 15.00% strategic, 40.00% middle-management, and 45.00% operational respondents. These corrected percentages replace inconsistent values in the earlier version.

*4.1.1 Descriptive Statistics of Constructs*

To enhance clarity and provide a clearer comprehension of data variability, descriptive statistics including the mean and standard deviation for all key Likert-scale elements were computed. This information elucidates the primary trends and fluctuations in participants' replies on the five-point scales (1 = Strongly Disagree to 5 = Strongly Agree). The results are summarised in Table 3 seen below.

**Table 3. Descriptive Statistics of Main Constructs**

| Construct | Number of Items | Mean | Std. Deviation |
|---|---|---|---|
| Economic Disclosure | 5 | 4.12 | 0.53 |
| Social Disclosure | 5 | 4.08 | 0.59 |
| Environmental Disclosure | 5 | 4.15 | 0.50 |
| Financial Performance | 5 | 4.03 | 0.62 |
| Supply Chain Visibility | 5 | 3.97 | 0.68 |

The mean scores indicate that participants typically concurred with statements across all constructs, reflecting positive perceptions of sustainability disclosure and performance. Notably, standard deviations range from 0.50 to 0.68, suggesting sufficient variation in responses and avoiding issues of excessive central tendency or response bias. These variations support the appropriateness of applying PLS-SEM to model inter-variable relationships. Although the

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standard deviations are modest (ranging from 0.50 to 0.68), signifying a clustering of responses toward the upper end of the scale (typically around category 4: "Agree"), this pattern is not uncommon in survey-based research involving senior executives or managers, who often exhibit more consistent and aligned views on structured sustainability initiatives. To assess potential central tendency bias, we examined item-level distributions and found no significant evidence of acquiescence bias or extreme response bias. Moreover, PLS-SEM is robust to moderate non-normality in indicator distributions and is specifically suited for managerial perception data (Hair et al., 2019). Nevertheless, we see this as a constraint in including more diversity and suggest subsequent studies employing mixed-method or triangulated data to corroborate results. Responses clustered between "Neutral" and "Strongly Agree," indicating limited variance. This reflects the sample of senior managers from firms engaged in sustainability. While this may constrain generalizability, PLS-SEM is appropriate for such distributions. We recommend future studies include firms with lower sustainability adoption for broader variance.

### 4.2 Assessment of Measurement Model

In PLS-SEM, it is crucial to evaluate the measurement models to analyze results (Shahadat et al., 2024). This entails analyzing the relationship between indicator variables and latent constructs. It is essential to evaluate the reliability and validity of reflective constructs in the measurement model, which includes indicator reliability, internal consistency, convergent validity, and discriminant validity.

#### *4.2.1 Indicator Reliability*

The validity of indicators in a reflective measurement model is examined by assessing if loadings are more than 0.708, suggesting that the construct clarifies more than 50% of the variation of the indicator (Zhao et al., 2023). At first, every indication satisfied this criterion, affirming their dependability (Billah et al., 2023). Indicators that failed to match the criteria were omitted.

#### *4.2.2 Internal Consistency Reliability*

The evaluation of internal consistency reliability was performed using composite reliability, where values ranging from 0.60 to 0.90 are considered satisfactory, and values over 0.95 suggest possible redundancy (Jantaro & Badir, 2024; Kalyar et al., 2020). The findings presented in Table 4 varied from 0.902 to 0.934, signifying "satisfactory" to "good" reliability. Cronbach's alpha, typically producing lower results than composite reliability, additionally achieved the 0.70 standard for all constructs (Table 4). Cronbach's alpha relies on unweighted items, whereas composite reliability takes into account item loadings. Kamra et al. (2024) indicate that Rho_A provides a well-rounded metric, achieving an ideal value of 0.70. Every latent variable in our research surpassed this benchmark, establishing a dependable equilibrium between Cronbach's alpha and composite reliability.

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**Table 4. Internal Consistency Reliability results**

| Constructs | Cronbach's alpha | Composite reliability (rho_c) | Composite reliability (rho_a) |
|---|---|---|---|
| **Economic disclosure** | 0.863 | 0.902 | 0.892 |
| **Environmental disclosure** | 0.876 | 0.910 | 0.881 |
| **Financial performance** | 0.886 | 0.916 | 0.895 |
| **Social disclosure** | 0.911 | 0.934 | 0.916 |

*Source: PLS-SEM Analysis*

*4.2.3 Convergent Validity*

Convergent validity evaluates the degree to which a construct accounts for the variability among its indicators. This is ascertained by assessing the Average Variance Extracted (AVE), which quantifies the fraction of variance acquired through the construct's indications . An AVE of 0.50 signifies that the construct accounts for over fifty percent of the variance in the indicators (Kuran, 2024). According to Table 5, every construct attained AVE values over 0.50, so validating the presence of convergent validity.

**Table 5. Convergent Validity Results**

| Constructs | Average variance extracted (AVE) |
|---|---|
| **Economic disclosure** | 0.653 |
| **Environmental disclosure** | 0.671 |
| **Financial performance** | 0.687 |
| **Social disclosure** | 0.738 |

*Source: PLS-SEM Analysis*

*4.2.4 Discriminant Validity*

Discriminant validity assesses if the constructs within the model are separate entities, confirming that each construct evaluates a unique dimension not represented by others (Kweyama et al., 2024). This research evaluated discriminant validity by cross-loadings, the Fornell-Larcker criterion, and

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the heterotrait-monotrait ratio (HTMT). Cross-Loadings: This approach evaluates the loadings of each item in relation to all constructs. A construct is deemed discriminant when its indicators demonstrate an elevated loading on their designated construct compared to others. Table 6 illustrates that the indicators predominantly align with their assigned constructs, indicating discriminant validity. Fornell-Larcker Criterion: This guideline mandates that the square root of the Average Variance Extracted (AVE) for every construct should surpass its correlations with other constructs. HTMT Ratio: HTMT values that fall beneath the threshold (0.85) signify robust discriminant validity. The evaluations indicate that the constructs within the model have robust discriminant validity.

**Table 6. Cross-loadings Results**

| Indicators | Economic disclosure | Environmental disclosure | Financial performance | Social disclosure |
|---|---|---|---|---|
| **ECD1** | **0.825** | 0.611 | 0.580 | 0.681 |
| **ECD2** | **0.869** | 0.592 | 0.512 | 0.665 |
| **ECD3** | **0.849** | 0.568 | 0.486 | 0.547 |
| **ECD4** | **0.871** | 0.657 | 0.662 | 0.721 |
| **ECD5** | **0.590** | 0.517 | 0.362 | 0.481 |
| **EVD1** | 0.563 | **0.750** | 0.561 | 0.689 |
| **EVD2** | 0.639 | **0.855** | 0.659 | 0.765 |
| **EVD3** | 0.575 | **0.882** | 0.701 | 0.782 |
| **EVD4** | 0.656 | **0.845** | 0.586 | 0.706 |
| **EVD5** | 0.565 | **0.755** | 0.670 | 0.578 |
| **FNP1** | 0.635 | 0.725 | **0.825** | 0.706 |
| **FNP2** | 0.462 | 0.513 | **0.761** | 0.525 |
| **FNP3** | 0.518 | 0.656 | **0.864** | 0.547 |
| **FNP4** | 0.600 | 0.702 | **0.879** | 0.691 |

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|---|---|---|---|---|
| **FNP5** | 0.494 | 0.609 | **0.810** | 0.601 |
| **SCD1** | 0.696 | 0.662 | 0.579 | **0.814** |
| **SCD2** | 0.680 | 0.761 | 0.632 | **0.870** |
| **SCD3** | 0.719 | 0.746 | 0.581 | **0.866** |
| **SCD4** | 0.629 | 0.743 | 0.696 | **0.866** |
| **SCD5** | 0.632 | 0.778 | 0.706 | **0.878** |

*Source: PLS-SEM Analysis*

The Fornell-Larcker criteria assesses discriminant validity by contrasting the average variance extracted (AVE) of constructs with the variance that is shared among them. To demonstrate discriminant validity the Average Variance Extracted (AVE) for every construct should surpass its correlations with alternative constructs. Table 7 illustrates that each latent variable has a stronger correlation with its respective indicators compared to other latent variable. The bolded top values in every row and column affirm the attainment of discriminant validity.

**Table 7. Fornell-Larcker Criterion Results**

| Constructs | Economic disclosure | Environmental disclosure | Financial performance | Social disclosure |
|---|---|---|---|---|
| **Economic disclosure** | **0.808** | | | |
| **Environmental disclosure** | 0.731 | **0.819** | | |
| **Financial performance** | 0.660 | 0.781 | **0.829** | |
| **Social disclosure** | 0.777 | 0.748 | 0.859 | **0.860** |

*Source: PLS-SEM Analysis*

The limitations of the Fornell-Larcker criterion for evaluating discriminant validity have been brought to light by recent research, especially when indicator loadings on constructs are close. The heterotrait-monotrait (HTMT) ratio of correlations is suggested by Lassou et al. (2024) as a more precise metric. Compared to Fornell-Larcker and cross-loadings, the HTMT provides more sensitivity and specificity by dividing the mean correlation across items of distinct constructs by

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the average correlation within the same construct (Latimena & Isnawaty, 2024). For conceptually comparable conceptions, an HTMT value above 0.90 indicates possible discriminant validity problems; for more dissimilar constructs, a more cautious threshold of 0.85 is recommended (Billah et al., 2023). To determine whether HTMT readings significantly deviate from these criteria, bootstrapping with a 95% confidence interval is employed. The HTMT ratio between environmental disclosure and social disclosure is 0.962, exceeding both the commonly used 0.85 and 0.90 thresholds. This indicates a substantial risk that respondents do not empirically distinguish the two constructs clearly in this sample. The result qualifies the interpretation of their separate path coefficients and means that conclusions about the unique contribution of each disclosure dimension should be treated cautiously. Although the cross-loadings and Fornell–Larcker results provide some supporting evidence, they do not remove the concern raised by the HTMT result. The overlap may reflect the practical integration of social and environmental initiatives, but it may also indicate measurement-item similarity or limited discriminant validity. The constructs have therefore been retained in line with the study's stated theoretical model, while this limitation is explicitly acknowledged; future studies should refine the items and test a higher-order sustainability-disclosure construct. The high HTMT value is a substantive measurement limitation, not merely a formatting issue. It suggests that the estimated effects for environmental and social disclosure may partly reflect shared variance between the constructs. Accordingly, the finding that environmental disclosure has the largest coefficient should be read as the largest reported association in the specified model, rather than conclusive evidence that its unique effect is statistically larger than the social-disclosure effect. Future research should use refined measures and assess alternative model specifications. The overlap may reflect the integrated nature of sustainability practices, where environmental initiatives affect workers and communities and social initiatives may be reported alongside environmental programmes. It may also reflect respondents' difficulty distinguishing the two disclosure domains. This issue limits confidence in their empirical distinctiveness and should be considered when interpreting the separate coefficients.

**Table 8. HTMT Ratio Results**

| Constructs | Economic disclosure | Environmental disclosure | Financial performance | Social disclosure |
|---|---|---|---|---|
| **Economic disclosure** | | | | |
| **Environmental disclosure** | 0.845 | | | |

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| | | | |
|---|---|---|---|
| **Financial performance** | 0.732 | 0.823 | |
| **Social disclosure** | 0.812 | 0.962 | 0.819 |

*Source: PLS-SEM Analysis*

### 4.3 Structural Model Evaluation

The connections among the constructs are illustrated in the internal (structural) model. The structural model is examined in PLS-SEM after the measurement model has been evaluated properly. The effect size ($f^2$), the R-squared value ($R^2$), and the magnitude and relevance of route coefficients are important evaluation criteria. Furthermore, the PLS prediction technique is employed to assess the model's forecasting prowess for outcomes not present in the original dataset (Sharma et al., 2023).

#### *4.3.1 Multicollinearity Problems in the Structural Model*

Checking for multicollinearity, which happens when predictors are highly linked, is the first stage in assessing a structural model (Emon & Khan, 2024). The variance inflation factor (VIF) for each variable is utilised for evaluating multicollinearity; a threshold of 5 or less is advised to prevent bias in the results (Emon & Khan, 2024). All of the VIF values in our model fell within acceptable bounds, indicating that collinearity did not endanger the analysis. Table 9 displays the results of the collinearity statistics.

**Table 9. Collinearity Statistics (Outer VIF)**

| Items | VIF |
|---|---|
| **ECD1** | 1.588 |
| **ECD2** | 2.202 |
| **ECD3** | 2.765 |
| **ECD4** | 2.479 |
| **ECD5** | 2.334 |
| **EVD1** | 1.918 |
| **EVD2** | 1.740 |

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| | |
|---|---|
| **EVD3** | 1.962 |
| **EVD4** | 3.380 |
| **EVD5(Emon & Khan, 2024)** | 2.669 |
| **FNP1** | 2.495 |
| **FNP2** | 1.991 |
| **FNP3** | 3.384 |
| **FNP4** | 2.997 |
| **FNP5** | 2.128 |
| **SCD1** | 2.233 |
| **SCD2** | 2.744 |
| **SCD3** | 2.319 |
| **SCD4** | 2.200 |
| **SCD5** | 2.805 |

*Source: PLS-SEM Analysis*

*4.3.2 Evaluating the Significance of Path Coefficient in a Structural Model*

The subsequent phase involves evaluating the importance of the path coefficients among the latent variables in the model once multicollinearity has been checked. Bootstrapping utilising 5000 subsamples with a two-tailed significance threshold of 0.05 (5%) in Smart-PLS is used for this. A non-parametric resampling method called bootstrapping evaluates a statistic's variability without depending on parametric assumptions (Abu Afifa & Nguyen, 2024). PLS-SEM is suitable for using t-statistics to analyze direct and indirect effects because it does not imply data normality (Abu Afifa & Nguyen, 2024). Table 10 presents the findings. Furthermore, construct reliability can be confirmed using bootstrap confidence intervals. For example, construct dependability is deemed appropriate If the lower limit of the 95% confidence interval exceeds 0.70 and the upper limit is below 0.95. For significance at the 5% level, a critical value of 1.65 is employed (Bowen & Siegler, 2024). Table 10 shows that two of the four tested hypotheses are supported by the critical t-value of 1.65.

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**Table 10. Direct Relationship for Testing Hypothesis**

| Relationship | Path coefficient | T values | P values | Decision | 95% CI LL | 95% CI UL |
|---|---|---|---|---|---|---|
| **H1: Economic disclosure -> Financial performance** | 0.120 | 2.941 | 0.027 | ***Supported*** | 0.107 | 0.385 |
| **H2: Social disclosure -> Financial performance** | 0.223 | 3.163 | 0.016 | ***Supported*** | 0.202 | 0.555 |
| **H3: Environmental disclosure -> Financial performance** | 0.501 | 7.656 | 0.000 | ***Supported*** | 0.254 | 0.793 |

*Source: PLS-SEM Analysis*

Economic disclosure was positively associated with perceived financial performance ($\beta = 0.120$, $p = 0.027$), supporting H1. One possible interpretation is that clearer reporting about economic value creation, resource use, and financial governance is associated with stronger stakeholder confidence and perceived performance. The cross-sectional design does not establish that disclosure caused the performance outcome. Social disclosure was positively associated with perceived financial performance ($\beta = 0.223$, $p = 0.016$), supporting H2. This association is consistent with the view that reporting on labour practices, employee well-being, and community engagement may accompany stronger reputation and stakeholder relationships. Given the overlap between social and environmental disclosure indicated by HTMT = 0.962, the distinct contribution of social disclosure should nevertheless be interpreted cautiously. Environmental disclosure had the largest reported positive association with perceived financial performance ($\beta = 0.501$, $p < 0.001$), supporting H3. This association is consistent with the possibility that environmental reporting accompanies resource efficiency, environmental-risk management, and stakeholder confidence. However, the HTMT value between environmental and social disclosure indicates substantial construct overlap, so the coefficient should not be interpreted as definitive evidence of a uniquely larger causal effect.

*4.3.3 Evaluating the Goodness of Fit (GOF)*

The R2 coefficient was used to evaluate the structural model's goodness of fit (GOF). The model's proficiency in accounting for the variance in the endogenous factors is assessed by R2. Increased figures on the scale ranging from 0 to 1 denote a more favourable alignment. According to Table 11, the model used in this investigation has an R2 of 0.638, indicating excellent explanatory power because it explains 63.8% of the fluctuation in the intrinsic factors.

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**Table 11. R Square Results**

| Dependent variable | R-square | R-square adjusted |
|---|---|---|
| **Financial performance** | 0.638 | 0.628 |

*Source: PLS-SEM Analysis*

The Standardized Root Mean Squared Residual (SRMR) was utilized to evaluate the model's goodness of fit (GOF). Good SRMR values are those that are less than 0.08. According to Table 12, the model's SRMR is 0.071, signifying an excellent match and the absence of misspecifications in both the measurement and structural models.

**Table 12. SRMR Results**

| | Saturated model | Estimated model |
|---|---|---|
| **SRMR** | 0.071 | 0.071 |

*Source: PLS-SEM Analysis*

*4.3.4 Assessing the Effect Size*

Cohen's f2 measures effect size, which evaluates how independent variables affect the dependent construct. There are three categories for values: small (0.020–0.150), medium (0.150–0.350), and large (over 0.350). Table 13 demonstrates that accounting regulation has a major impact on business performance, and the disclosure of waste management exerts a moderate influence.

**Table 13. F Square Results**

| Constructs | Economic disclosure | Environmental disclosure | Financial performance | Social disclosure |
|---|---|---|---|---|
| **Economic disclosure** | | | 0.025 | |
| **Environmental disclosure** | | | 0.172 | |
| **Financial performance** | | | | |
| **Social disclosure** | | | 0.030 | |

*Source: PLS-SEM Analysis*

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### 4.4 Moderating Analysis

The moderation analysis tested whether supply chain visibility changes the strength of the association between each sustainability-disclosure dimension and perceived financial performance. Positive interaction coefficients indicate that the disclosure–performance association becomes more positive as supply chain visibility increases, subject to the measurement and cross-sectional limitations described above.

**Table 14. Moderating Analysis Results**

| Relationship | Path coefficient | T values | P values | Decision | 95% CI LL | 95% CI UL |
|---|---|---|---|---|---|---|
| **H4: SCV x Economic disclosure -> Financial performance** | 0.286*** | 9.731 | 0.007 | ***Supported*** | 0.028 | 0.240 |
| **H5: SCV x Social disclosure -> Financial performance** | 0.452** | 3.234 | 0.026 | ***Supported*** | 0.064 | 0.513 |
| **H6: SCV x Environmental disclosure -> Financial performance** | 0.530*** | 7.135 | 0.004 | ***Supported*** | 0.066 | 0.414 |

*Source: PLS-SEM Analysis*

The economic-disclosure interaction was positive and statistically significant as reported (β = 0.286, p = 0.007), supporting H4. In practical terms, economic disclosure is more strongly associated with perceived financial performance among firms whose supply chains are more visible. Visibility may help managers corroborate supplier information, identify cost or compliance issues, and provide stakeholders with more credible evidence. This interpretation describes a conditional association, not a causal effect.

The social-disclosure interaction was positive and statistically significant as reported (β = 0.452, p = 0.026), supporting H5. This suggests that social disclosure is more strongly associated with perceived financial performance when firms can trace supplier practices and share reliable information about labour, safety, and community-related issues. This may increase stakeholder confidence, although the HTMT concern between social and environmental disclosure requires caution in interpreting the distinct social effect.

The environmental-disclosure interaction was positive and statistically significant as reported (β = 0.530, p = 0.004), supporting H6. This suggests that visibility may strengthen the association between environmental disclosure and perceived financial performance by helping firms monitor

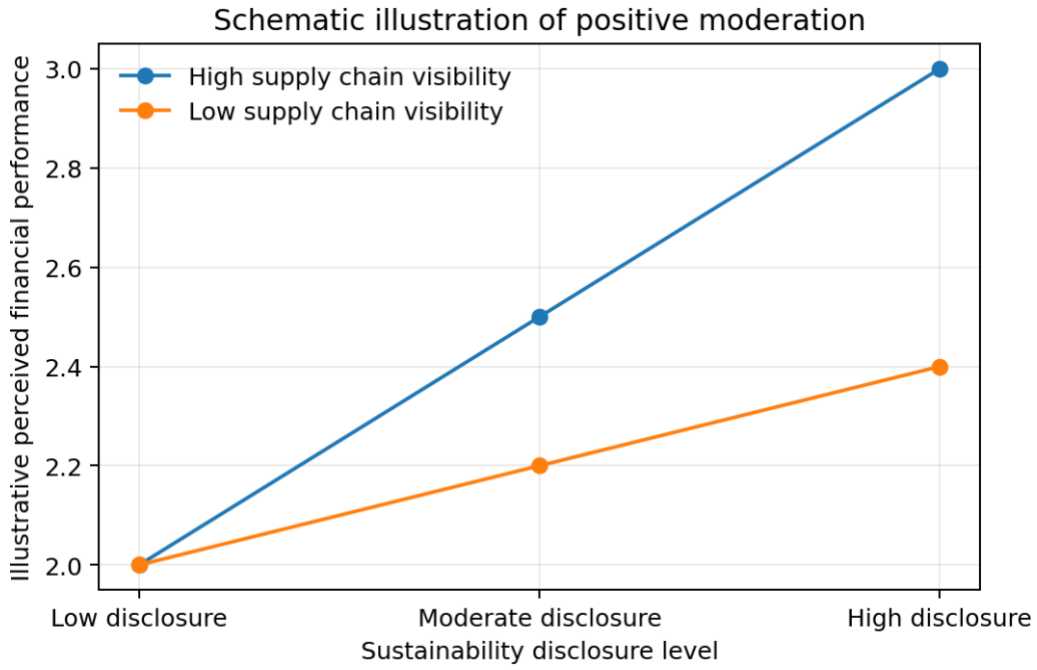
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resource use, trace environmental risks, and verify supplier compliance. The interaction should be interpreted as a moderation association within this sample rather than proof that visibility causes improved financial outcomes.

**Figure 1. Schematic interaction illustration (not estimated from respondent-level data)**




Note: The figure illustrates the expected direction of a positive interaction only. It is not an empirical simple-slope plot; an estimated interaction plot should be produced from the original SmartPLS data before publication.

### 4.5 Discussion of Results

This study examined the associations of economic, social, and environmental sustainability disclosure with perceived financial performance among listed manufacturing firms in Ghana and tested supply chain visibility as a moderator. The results indicate positive associations for all three disclosure dimensions and positive interaction terms for supply chain visibility. Environmental disclosure had the largest reported coefficient in the estimated model. These results are consistent with NRBV's emphasis on sustainability-related capabilities and Stakeholder Theory's emphasis on credible information and stakeholder confidence. Nevertheless, the cross-sectional design and the elevated HTMT ratio between social and environmental disclosure mean that the results should be interpreted as associations and that the distinct effects of the two constructs require further validation.

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Economic disclosure was positively associated with perceived financial performance, supporting H1. From an NRBV perspective, reporting on resource allocation and economic value creation may accompany efficient resource management. From a Stakeholder Theory perspective, transparent economic information can reduce information asymmetry and support stakeholder confidence. Because the data are cross-sectional, these explanations are plausible interpretations rather than demonstrated causal mechanisms.

Social disclosure was positively associated with perceived financial performance, supporting H2. This pattern is consistent with NRBV's emphasis on human and relational capabilities and Stakeholder Theory's focus on employee, customer, and community expectations. However, the HTMT value of 0.962 between social and environmental disclosure suggests substantial empirical overlap, so the estimated social association may partly capture variance shared with environmental disclosure.

Environmental disclosure showed the largest reported positive association with perceived financial performance, supporting H3. NRBV suggests that environmental capabilities can support resource efficiency and risk management, while Stakeholder Theory suggests that transparent environmental information may strengthen legitimacy and confidence. The result indicates a strong association in the specified model, but the design does not establish causality or prove that the environmental coefficient is uniquely larger after accounting for measurement overlap.

Supply chain visibility positively moderated the associations between all three disclosure dimensions and perceived financial performance, supporting H4–H6. Under NRBV, visibility can strengthen sustainability capabilities by improving monitoring, coordination, and early identification of supply-chain risks. Under Stakeholder Theory, traceability and verifiable supplier information can increase the credibility of sustainability claims and stakeholder confidence. The interaction terms therefore suggest that disclosure is more strongly associated with perceived performance at higher levels of visibility. Because item-level data and estimated simple slopes were not available in the supplied manuscript, the accompanying interaction illustration is explicitly schematic and is not presented as an empirical plot of the estimated model.

## 5. Conclusion, Implications and Limitations

### 5.1 Conclusion

This study examined the relationships between economic, social, and environmental sustainability disclosure and perceived financial performance among listed manufacturing firms in Ghana, including the moderating role of supply chain visibility. All three disclosure dimensions were positively associated with perceived financial performance, and the reported interaction terms were positive. Environmental disclosure had the largest coefficient in the specified model. The results contribute to sustainability and supply-chain research in an emerging-market context, but they should be interpreted as cross-sectional associations. In addition, the HTMT value of 0.962

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between environmental and social disclosure indicates a discriminant-validity concern that qualifies claims about their separate effects.

### 5.2 Theoretical Implications

The research makes specific contributions to the development and application of the Natural Resource-Based View and Stakeholder Theory. With respect to the Natural Resource-Based View, the results indicate that sustainability disclosure is not simply a communication activity but a manifestation of underlying sustainability capabilities. The positive impact of economic, social, and environmental reporting on financial outcomes suggests that firms that develop and disclose such capabilities are better positioned to achieve competitive advantage. Environmental disclosure in particular supports NRBV's assertion that environmentally oriented capabilities, including the mitigation of pollution and resource efficiency, can generate superior performance. By presenting proof from the setting of a developing economy, the study extends NRBV beyond its traditional focus on firms in developed markets and shows that capability-based advantages grounded in sustainability are also relevant in resource-constrained settings where environmental and social risks are pronounced. The moderating effect of supply chain visibility further enriches NRBV by illustrating that complementary capabilities in information transparency and supply chain monitoring enhance the effectiveness of sustainability capabilities in generating financial returns.

With regard to Stakeholder Theory, the research offers empirical evidence for the notion that meeting stakeholder expectations through transparent sustainability disclosure contributes to improved financial outcomes. The positive relationships between all three disclosure dimensions and financial performance suggest that stakeholders in emerging economies respond favorably to firms that demonstrate responsible economic management, social commitment, and environmental stewardship. The results confirm that sustainability disclosure enhances legitimacy and trust among investors, employees, communities, and regulators, which translates into financial benefits. The moderating role of supply chain visibility contributes a novel facet to Stakeholder Theory by indicating that stakeholders not only value disclosure at the firm level but also increasingly evaluate the transparency of the whole supply chain. Visibility strengthens the credibility of disclosures by providing verifiable evidence that sustainability commitments extend beyond the firm's internal operations. This shows that stakeholder evaluations are shaped by both the content of sustainability reports and the degree to which these disclosures are supported by traceable and transparent supply chain practices. In this way, the study advances Stakeholder Theory by integrating the concept of supply chain visibility into the understanding of how firms build and maintain legitimacy. The findings of this study produce numerous practical applications that are directly relevant to organizations, managers, and policymakers in emerging economies.

### 5.3 Implications for Organizations and Managers

For organizations and managers, the results clearly indicate that economic, social, and environmental disclosures are strategic tools that can lead to improved financial performance when

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executed effectively. Managers should therefore move beyond viewing sustainability disclosure as a compliance requirement and instead integrate it into their organizational strategy. Strengthening sustainability measurement systems, adopting reliable reporting frameworks, and ensuring accuracy and consistency in disclosure will help firms build stronger reputational capital and reduce information asymmetry with key stakeholders such as investors, customers, employees, and supply chain partners.

The study also reveals that environmental disclosure produces the strongest financial benefits. Managers should prioritize environmental performance by investing in resource-efficient technologies, waste reduction programs, emissions control systems, and compliance with environmental standards. These operational improvements not only yield cost savings but also enhance the firm's long-term competitiveness in sustainability-conscious markets. Social disclosure is equally important, as transparent reporting of labor practices, employee development, safety standards, and community engagement initiatives strengthens internal morale, reduces turnover, and improves community relations. Managers are encouraged to design employee-centered policies and socially responsible initiatives that can be communicated effectively through sustainability reports.

The moderating role of supply chain visibility underscores the need for organizations to build and maintain transparent, traceable, and well-monitored supply chains. Managers ought to allocate resources toward digital frameworks that improve visibility, such as real-time monitoring tools, supplier databases, and integrated information platforms. These systems allow firms to verify supplier compliance, detect sustainability risks early, and produce credible disclosures that stakeholders can trust. Improving visibility also strengthens supplier relationships, reduces disruptions, and enhances resilience across the supply chain. Ultimately, managers must recognize that sustainability commitments made at the organizational level are only as credible as the actions taken across the broader supply chain.

### 5.4 Implications for Policymakers

The study presents important implications for policymakers seeking to enhance sustainability performance in emerging markets. Initially, the favorable correlation between sustainability disclosure and financial success indicates that governments have to persist in enhancing sustainability reporting standards. Clear, consistent, and enforceable reporting standards can help firms improve the quality and comparability of their disclosures. Policymakers may consider aligning national reporting requirements with global standards such as GRI or IFRS Sustainability Standards to ensure credibility and international relevance. Second, since supply chain visibility significantly strengthens the benefits of sustainability disclosure, policymakers have a role in supporting digital infrastructure that enables traceability and transparency. Investing in national or sector-specific digital platforms, offering incentives for technology adoption, and facilitating access to digital tools for small and medium-sized suppliers can improve visibility throughout the

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supply chain ecosystem. Policymakers can also advocate for certifications, auditing systems, and compliance initiatives that foster responsible sourcing and supplier responsibility. Third, policymakers can foster an enabling environment for sustainability by integrating sustainability criteria into public procurement, offering tax incentives for environmentally responsible operations, and establishing sustainability-linked financing schemes. Such policies can incentivize companies to embrace stronger sustainability practices while rewarding those that demonstrate leadership in disclosure and supply chain transparency. Finally, capacity-enhancement endeavors including educational workshops, industry workshops, and sustainability reporting support centers, can equip firms possessing the abilities needed to generate high-quality disclosures and build visibility capabilities.

### 5.5 Limitations of the Study and Suggestions for Future Research

This study has several limitations. First, the sample consists of 120 manager responses relating to listed manufacturing firms in Ghana, which limits generalisation to other sectors and countries. Second, the financial-performance construct is perceptual and includes innovation, management practices, investor appeal, and market/export orientation; it should not be equated with audited accounting performance. Third, the HTMT value of 0.962 between environmental and social disclosure raises a concern about discriminant validity and the interpretation of their separate coefficients. Fourth, the cross-sectional, single-source survey design limits causal inference and may be affected by common-method and reverse-causality concerns. Future research should use longitudinal or multi-source designs, refine the measurement items, and validate perceptual performance against objective financial indicators. The study relied on respondents' perceptions of sustainability disclosure, supply chain visibility, and performance. Such measures may be influenced by recall, social-desirability, or common-method bias. Future studies could triangulate survey responses with sustainability reports, supplier-traceability records, and audited financial data to improve measurement validity and reduce reliance on a single source. Finally, the cross-sectional design cannot establish temporal ordering or definitive causal relationships. Longitudinal studies, repeated surveys, or designs combining survey measures with objective performance data would help establish whether changes in disclosure and supply chain visibility precede changes in financial outcomes.

### Declarations:

### Ethical Statement

The Ethics Committee of the University of Business and Integrated Development Studies granted ethical approval for this investigation. In order to guaranty that the research objectives, design, and methodology were in accordance with ethical standards for human participant research, the committee conducted a review. The tenets of the Declaration of Helsinki, along with institutional and national ethical standards, were applied to all procedures.

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**Informed Consent**

The study's purpose, procedures, potential hazards, and participants' rights were all thoroughly explained to,all individuals before their involvement. To ensure voluntary participation and full understanding of the study, we obtained written informed consent from all participants. The research process was conducted with the utmost confidentiality and anonymity of participant data.

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