

Strengthening Banking Stability: Green Banking, ESG Performance, Intellectual Capital and CGC as a Moderating Variable

Lasty Agustuty^{1*}, Nurfatwa Andriani Yasin², Afriyani Afriyani³, Andi Rifqah Purnama Alam⁴

STIE Tri Dharma Nusantara, Sulawesi Selatan, Indonesia^{1,2,3,4}

lastyagustuty@gmail.com^{1*}, nurfatwa7@gmail.com², afriyani.ilyas01@gmail.com³,
andirifqah.alam@gmail.com⁴



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Abstract

Purpose: This study explores the influence of green banking, Environmental, Social, and Governance (ESG), and intellectual capital on increasing financial stability, with effective corporate governance as a moderating variable, specifically in the context of Indonesian Sharia banks.

Methodology: This study employs a quantitative methodology, focusing on nine Sharia Banks selected through purposive sampling. Data were sourced from annual reports, sustainability reports, and financial statements spanning 2020-2024. Statistical analysis was conducted using multiple linear panel data regression and Moderated Regression Analysis (MRA) with EViews software.

Results: This study finds that green banking, ESG, intellectual capital, and Good Corporate Governance (GCG) significantly and positively influence financial stability. The moderating variable, GCG, considerably influences the relationship between intellectual capital and financial stability. Nonetheless, it fails to reinforce the connections between green banking and financial stability and between ESG and financial stability.

Conclusion: Sharia banks must continually focus on managing intangible assets, including green banking, ESG, and enhancing intellectual capital, as these are interconnected with improving performance, operational efficiency, competitive advantage, maximizing profits, and maintaining the bank's financial stability.

Limitations: The generalizability of the results to other countries or banking contexts may be restricted by the research's emphasis on Indonesian Sharia banks.

Contributions: This study enhances the understanding of Indonesia's green banking policies and corporate governance, providing useful perspectives for regulators and bank management to enhance financial stability.

Keywords: *Banking Financial Stability, ESG Performance, Good Corporate Governance, Green Banking, Intellectual Capital*

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1. Introduction

A stable banking and financial system are a crucial pillar of the national economy, maintaining the smooth operation of the payment system, encouraging investment, and supporting the productivity of the real sector. Environmental issues, particularly climate change, pose threats to financial stability in the banking sector. This threatens the financial stability of banks through physical risks (damage to collateral assets from disasters), transition risks, increased Non-Performing Loans (NPLs), decreased collateral value, and heightened reputational and legal risks related to financing industries that harm the environment.

Banks may be directly or indirectly involved in environmental issues. Based on market capitalization values in June 2023, the banking sector provided approximately USD 30.5 billion (40 percent) of the total loans to companies operating in the palm oil, rubber, pulp and paper, and timber sectors in Indonesia. These companies engage in environmentally damaging activities such as deforestation, peatland degradation, and pollution of rivers and lakes ([Rainforest Action Network, 2023](#)).

The serious threat of biodiversity loss significantly impacts natural capital and poses risks to economic and social development. According to the National Development Planning Agency atau *Badan Perencanaan Pembangunan Nasional* (BAPPENAS), Indonesia's economic losses in 2019 and 2020 were substantial, with estimated losses of IDR 102.3 trillion and IDR 115.4 trillion, respectively, across four key sectors: marine and coastal, water, agriculture, and health sectors. These losses continued to increase to IDR 544 trillion by 2024, representing a 12.76% increase in the last five years. The National Development Planning Agency (BAPPENAS) estimates that Indonesia could lose up to 5% of its Gross Domestic Product (GDP) by 2050 due to the impacts of climate change ([Nursella, Putri, & Nurhayati, 2025](#)).

The environmental footprint of the banking industry has prompted the development of green banking and Environmental, Social, and Governance (ESG) policies. These initiatives encourage banks to reconcile financial objectives with social and environmental imperatives by integrating sustainability into their operations. The transformation of banks into environmentally friendly institutions can be seen, for example, in operational activities, such as minimizing carbon footprints, as well as in financing policies that support environmentally friendly and sustainable projects. Its implementation is expected to create new development and business opportunities and innovatively support sustainable finance to achieve long-term profitability. Although the OJK has issued regulations on the transparency of environmentally friendly performance that Indonesian banks must comply with, not all banks have consistently released sustainability reports.

According to Stakeholder Theory, green banking and ESG can strengthen the relationship between banks and stakeholders by improving their reputation. Consistent sustainability practices foster a positive perception among investors and regulatory support, thereby improving financial performance ([Ibe-enwo, Igbudu, Garanti, & Popoola, 2019](#)). According to research results ([Panjaitan, Siahaan, & Julyanthry, 2025](#)) and ([Wongso, Helsa, & Panggabean, 2023](#)), Green Banking implementation positively impacts financial stability, but some study results contradict this finding ([Siddiq, Sibarani, & Wisudanto, 2024](#)).

In addition to environmental issues, technological developments, market dynamics, and increasing stakeholder demands are obstacles faced by the banking industry. Currently, to survive in business competition, companies are transforming their business from labor-intensive models (workforce) to knowledge-driven businesses, where knowledge is the key characteristic. Therefore, a company's success hinges on transforming and capitalizing on knowledge to utilize resources efficiently, driving competitiveness and prosperity.

According to Resource-Based Theory (RBT), strategic assets that generate competitive advantages are valuable, scarce, inimitable, and non-substitutable. Effective management of intellectual capital can create strategic value, boosting banks' financial stability ([Chowdhury, Rana, & Azim, 2019](#)). Islamic banks have the potential to become major players in the national economies. In June 2025, total assets

reached Rp 653.88 trillion, up 6.54 percent Year-over-Year (YoY), according to data from the Financial Services Authority, which indicates rapid expansion. At 5.90 percent (YoY), this growth exceeds the typical growth of traditional banks. Islamic banks now hold a 7.44 percent market share.

This study analyzes the influence of intellectual capital, green banking, and ESG performance on the financial stability of Indonesian Sharia banks (2019-2024). This study introduces the integration of ESG variables and the application of Good Corporate Governance (GCG) as a moderating variable. GCG is a concept aimed at achieving a company's objectives, including banking performance. In implementing green banking, ESG, and intellectual capital mechanisms to improve banking financial stability, internal stakeholders must leverage supporting indicators such as audit committees, independent commissioners, and board size.

2. Literature Review and Hypotheses Development

2.1 Stakeholder Theory

Stakeholder theory examines the role of strategic management in strengthening external relationships and enhancing competitive advantages. A company's sustainability depends on its effective management of relationships with stakeholders. Sustainability is achieved when a company continuously considers the interests and welfare of its stakeholders ([Freeman, Dmytriiev, & Phillips, 2021](#)). Corporate activities and policies can affect various stakeholders, including employees, consumers, suppliers, the government, competitors, society, and shareholders. This theory seeks to guide corporate management in creating value through its activities, while reducing harm to stakeholders.

This theory posits that firms focus not only on profits but also on the effects of their activities on stakeholders. Implementing green banking, ESG, and intellectual capital shows the bank's accountability to stakeholders. Banks that implement green banking demonstrate responsibility towards the environment (stakeholders), thereby increasing public and customer trust. Through intellectual capital, human resources, systems, and relationships, companies can strengthen stakeholder relationships, thereby enhancing their value. ESG embodies a company's commitment to fulfilling its responsibilities to stakeholders (environmental, social, and governance). All three align with stakeholder theory: companies that pay attention to stakeholder interests (green banking, intellectual capital, ESG) tend to be more sustainable and valuable.

2.2 Resource-Based Theory

Resource-based theory suggests that a company's long-term survival depends on enhancing its resources. Competitive advantage comes from leveraging and investing in resources, particularly intellectual capital. Effective management of intellectual capital can enhance a company's competitive advantage ([Lipazya & Hermie, 2024](#)). According to Resource Based View (RBV) theory, valuable and uncommon internal resources that are difficult to replicate and cannot be substituted foster an enduring competitive advantage. In this study, green banking serves as a strategic resource that enhances operational efficiency, reputation, and environmental risk mitigation, thereby supporting banks' financial stability.

Implementing Environmental, Social, and Governance (ESG) practices can reflect responsible resource management, reduce reputational and operational risks, and increase stakeholder trust. Intellectual capital in banking (human, structural, and relational) serves as a valuable intangible asset that enhances innovation, efficiency, and adaptability, thereby strengthening banks' financial stability. Thus, green banking, ESG, and intellectual capital are strategic resources (according to the resource-based theory) that enhance banks' financial stability by improving performance and mitigating risk by boosting performance and reducing risk.

2.3 Green Banking on the Financial Stability of Islamic Banks

The growing problems of global warming, pollution, and waste have led consumers to become more committed to buying environmentally friendly products as they express their concerns about environmental issues ([Henry \(2022\)](#)). Green banking is an effort to implement bank operations while

considering environmental preservation, both internally and externally ([Hossain, Rahman, Hossain, & Karim, 2020](#)). The integration of green banking principles into banking operations focuses on ecologically transforming internal processes and systems, for example, by utilizing energy and technology, digitalization, and minimizing the carbon footprint of banking activities.

The implementation of financing distribution or other services emphasizes sustainable business by considering environmental risks and specifically supporting projects with environmentally friendly initiatives. The implementation of green banking practices significantly and positively influences banks' financial performance ([Siahaan, Silalahi, Syahyunan, & Sianipar, 2021](#); [Tampikalih, & Syafri, 2025](#); [Hossain et al., 2020](#); [Marakka, & Oktaviana, 2023](#)). This is attributed to companies' inadequate focus on implementing green banking policies, as their implementation entails extra costs, such as compliance costs, which, in turn, diminishes the inclination to enhance performance.

H₁: Green banking has a significant and positive influence on the financial stability of Islamic banks

2.4 ESG Performance on the Financial Stability of Islamic Banks

The implementation of ESG is a comprehensive approach to business. This method considers a company's internal management and its impact on society and the environment. The implementation of the ESG concept is driven by market, societal, and government demands that continuously emphasize the importance of sustainability in the business world, including banking operations. Investors consider incorporating ESG factors in their investment decisions.

Investors look for sustainable and responsible companies, as they believe that such companies will be more resilient and can provide long-term value. ESG disclosure serves as a means of accountability and transparency for stakeholders. ESG disclosure is a global standard for assessing a company's risk management and business opportunities ([Lupu, Hurduzeu, & Lupu, 2022](#)). Companies that implement ESG practices tend to perform better financially ([Muslichah, 2020](#)). ESG disclosure has a significant contribution to increasing company value because the market tends to be more responsive to transparency and reputation ([Habib, Oláh, Khan, & Luboš, 2025](#)).

H₂: ESG performance has a significant and positive influence on the financial stability of Islamic banks

2.5 Intellectual Capital on the Financial Stability of Islamic Banks

Intellectual capital is an important resource that gives businesses a competitive edge. Human Capital (HC), Structural Capital (SC), and Capital Employees (CC) are the three main components of intellectual capital ([Nasution, 2023](#)). Capital Employed Value Added (CAVA) reflects a company's ability to manage its resources effectively to generate profits ([Caesar & Isbanah, 2020](#)). An increase in value added generated from total equity indicates improved resource utilization, which may contribute to enhanced bank performance. Several empirical studies have demonstrated that Value Added Capital Employed (VACA) has a significant effect on Return on Assets (ROA) ([Ousama, Hammami, & Abdulkarim, 2020](#); [Wongso, Helsa, & Panggabean, 2023](#)). However, contrasting findings were reported by [Rahajeng and Hasibuan \(2020\)](#), who found that CAVA does not significantly influence ROA. Furthermore, Human Capital Value Added (HUVA) represents employees' intellectual capabilities, creativity, and innovation, which are essential components in creating organizational value ([Riahi, 2003](#)). Enhanced employee productivity enables firms to optimize asset utilization and increase profitability, as reflected in ROA ([Ousama et al., 2020](#); [Wongso et al., 2023](#)). In addition, Structural Capital Value Added (STVA) describes an organization's ability to utilize its internal structures, systems, and processes to support employees in generating intellectual and business value ([Sawarjuwono, 2004](#)). Higher structural capital contributes to greater organizational value creation and improved financial performance ([Andika, & Astini, 2022](#); [Rahajeng and Hasibuan, 2020](#)).

These findings indicate that structural capital may positively and significantly affect ROA, however, other studies have reported different results, showing that structural capital does not significantly

influence ROA ([Ousama et al., 2020](#); [Wongso et al., 2023](#)). Based on these theoretical perspectives and previous empirical evidence, the following hypothesis is proposed:

H₃: Intellectual capital has a positive and significant effect on the financial stability of Islamic banks

2.6 Good Corporate Governance on the Financial Stability of Islamic Banks

According to Stakeholder Theory, Good Corporate Governance (GCG) is crucial for maintaining stakeholder trust. by ensuring genuine commitment to sustainability rather than mere symbolism. GCG serves as a system of oversight and guidance in banking to improve transparency, accountability, and alignment with a company's strategic goals. Companies with strong GCG can maximize their planning potential, monitor the performance of environmental innovation, and manage external relationships in line with sustainability. GCG also helps create economic value through efficiency, reputation and adaptability to global environmental demands. Research by [Gull, Saeed, Suleman, and Mushtaq \(2022\)](#) provides empirical evidence that GCG affects financial performance. Companies with robust governance structures are associated with superior financial performance.

H₄: GCG has a positive and significant effect on the financial stability of Islamic banks

2.7 Green Banking, ESG Performance and Intellectual Capital on Financial Stability are Moderated by Good Corporate Governance

The effectiveness of efforts to implement environmental performance measures to improve financial performance also depends on the quality of the company's governance. Based on stakeholder theory, companies must consider the effects of their operations on various stakeholders, including the community and environment. When environmental management aligns with good corporate governance principles, it creates sustainable long-term value for the company, rather than focusing solely on administrative compliance. Effective GCG implementation ensures that environmental considerations are substantively integrated into corporate strategy and financial decision-making rather than merely serving as a symbolic gesture ([Gull et al., 2022](#)).

In addition, signal theory reveals that high-quality companies provide positive signals to the market. This theory also explains how to communicate all indicators of success and failure to the company's owners. In this case, efforts to disclose green banking practices, ESG, intellectual capital, and GCG constitute a strong signal of future expectations of financial stability. Organizations that prioritize environmental stewardship and social responsibility demonstrate that their emphasis extends beyond profit maximization. A positive GCG assessment indicates that the company is well managed and has an adequate control system.

H₅: Green banking on financial stability is moderated by GCG

H₆: ESG performance on financial stability is moderated by GCG

H₇: The effect of intellectual capital on financial stability is moderated by GCG

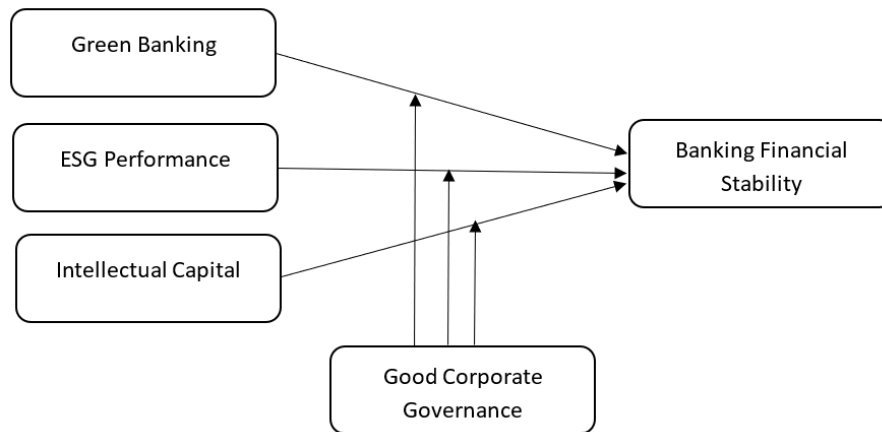


Figure 1. Conceptual framework

The conceptual framework of this study is presented in Figure 1.

3. Research Methodology

3.1 Research design

This study uses a quantitative methodology to examine the theories. This study investigates the potential moderating effect of Good Corporate Governance (GCG) on the financial stability of Islamic banks and the impact of green banking, ESG performance, and intellectual capital (Value Added Intellectual Capital/VAIC). Moderated Regression Analysis (MRA) and Panel Data Regression methodologies were implemented with the support of EViews. The moderating effect of GCG is considered in this study, which employs multiple linear regression to examine the relationships between financial stability, green banking, ESG performance, and VAIC components (CAVA, HUV, and SCVA).

The direct effect regression model is formulated to examine the relationship between green banking, ESG performance, and intellectual capital on financial stability, as presented in Formula 1.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \quad (1)$$

The moderating regression model is formulated to analyze the role of Good Corporate Governance (GCG) in moderating the relationship between the independent variables and financial stability, as presented in Formula 2.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \quad (2)$$

The intellectual capital regression model is formulated to examine the effect of VAIC components, including VACA, VAHU, and STVA, on financial stability, as presented in Formula 3.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 M + \beta_5 (X_1 \times M) + \beta_6 (X_2 \times M) + \beta_7 (X_3 \times M) \quad (3)$$

3.2 Population and Sample

The study population comprised all Sharia banks registered with the Financial Services Authority (OJK), selected through purposive sampling. The inclusion criteria were as follows: Sharia Commercial Banks registered with the OJK, publishing annual and sustainability reports from 2020 to 2024, not merging with other banks during the study period, and reporting positive value added from 2020 to 2024. Based on these criteria, only nine Sharia-compliant banks met them during the 2020-2024 period.

3.3 Data Analysis Method

This study used data analysis as follows:

Bank stability analysis method with the Z-score equation. In Islamic banks, where asymmetric information is a concern, the Z-score method is a useful analytical tool. Bankruptcy risk is measured by combining Return on Assets (ROA), the equity-to-asset ratio, and ROA volatility. A high Z-score indicates strong financial stability, whereas a low or near-zero score suggests vulnerability to bank failure ([Jiang, Levine, & Lin, 2023](#)). The formula for measuring bank stability is as presented in Formula 4

$$ZScore = \frac{ROA + \left(\frac{\text{Equity}}{\text{Total Assets}} \right)}{\text{Standard Deviation of ROA}} \quad (4)$$

Green banking: The ratio of declared things to the total mandatory disclosure items, the data from the sustainability report.

ESG Performance, the Global Reporting Initiative (GRI) index was used as a proxy for ESG performance. This index covers three dimensions: environmental (31 indicators), social (36 indicators), and governance (30 indicators) ([Shafira & Astuti, 2024](#)). A score of 1 or 0 was assigned to each item based on its disclosure in the sustainability report. The ESG score is determined by the proportion of disclosed items relative to the total number of indicators in each dimension.

Intellectual capital, which can be calculated in a few steps. Finding the value added: $VA = \text{Output} - \text{Input}$. Output = total sales and other income. Input = Operational expenses and other expenses (excluding employee expenses). Determining the capital employee value (CE), human capital (HU), and structural capital. $CE = \text{Net Profit} + \text{Equity}$. Human Capital = Total cost for employees. Structure capital = $VA - HU$. Calculating Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA) as presented in Formula 5, Formula 6 and Formula 7.

$$VAHU = \frac{VA}{HU} \quad (5)$$

$$VACA = \frac{VA}{CE} \quad (6)$$

$$STVA = \frac{VA}{ST} \quad (7)$$

GCG score is obtained by evaluating each subindex that has provisions, where each provision will be given 1 point if fulfilled and 0 points if not fulfilled (Score Subiindex).

4. Results and Discussions

4.1 Descriptive statistical analysis.

Table 1. Descriptive statistical analysis

	Financial Stability	Green Banking	ESG Performance	Intellectual Capital	GCG
Mean	56.99067	0.482822	21.81933	23.35800	14.47333
Median	32.82000	0.444000	2.490000	20.21000	14.40000
Maximum	190.2200	0.889000	251.5500	55.21000	19.50000
Minimum	1.660000	0.111000	-5.120000	2.010000	11.00000
Std. Dev.	58.96927	0.194576	55.67523	14.26526	2.065892
Probability	0.039728	0.558302	0.000000	0.200639	0.299208
Observations	45	45	45	45	45

The analysis presented in Table 1 encompasses 45 data points from nine Sharia Commercial Banks registered with the OJK, spanning the period from 2020 to 2024. The descriptive data for financial stability (Y) are as follows: mean of 56.99067, median of 32.82000, standard deviation of 58.96927, lowest of 1.660000 at Bank Muamalat Indonesia in 2021, and a maximum of 190.2200 at Bank Mega Syariah in 2021. The Green Banking variable (X_1) shows a mean of 0.482822 and median of 0.444000. The standard deviation is 0.194576, with Bank Victoria Syariah having the lowest value at 0.111000, and Bank Muamalat Indonesia the highest at 0.889000.

The ESG Performance variable (X_2) has a mean of 21.81933, a median of 2.490000, a minimum of -5.120000, and a maximum of 251.5500. The minimum ESG score of -5.120000 is due to several ESG indicators failing to meet the targets. The standard deviation was 55.67523. For example, some banks lack adequate environmental policies or fail to transparently report their environmental impact. Some banks do not report or have poor ESG performances. The Intellectual Capital variable (X_3) shows a mean of 23.35800, a median of 20.21000, a standard deviation of 14.26526, a minimum of 2.010000, and a maximum of 55.21000. The mean of the GCG variable (X_4) is 14.47333, the median is 14.40000, the lowest value is 11.00000, the highest value is 19.50000, and the standard deviation is 2.065892.

4.2 Panel Data Regression Analysis

The determination of the most suitable panel data estimation model relies on three assessments.

4.2.1 Chow Test

Table 2. Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	144.899247	(8,32)	0.0000
Cross-section Chi-square	162.763898	8	0.0000

The Chow test findings in Table 2 indicate a p-value of 0.0000, which is below the threshold of 0.05 ($0.0000 < 0.05$). The Chow test results indicate that the Fixed Effect Model (FEM) is more suitable than the Common Effect Model (CEM).

4.2.2 Hausman Test

Table 3. Hausman test results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.875727	4	0.9280

The Hausman test results in Table 3 indicate a p-value of 0.928, which exceeds the threshold of 0.05 ($0.928 > 0.05$). The Random Effects Model (REM) is more appropriate than the fixed effects model (FEM). The REM is regarded as the most appropriate model for the examination of the Hausman test.

4.2.3 Lagrange Multiplier Test

Table 4. Results of the lagrange multiplier test

Test Hypotheses			
	Cross-section	Time	Both
Breusch-Pagan	81.03740	2.335418	83.37282
	(0.0000)	(0.1265)	(0.0000)
Honda	9.002078	-1.528207	5.284824
	(0.0000)	--	(0.0000)
King-Wu	9.002078	-1.528207	3.949576
	(0.0000)	--	(0.0000)
Standardized Honda	12.21853	-1.374744	3.777066
	(0.0000)	--	(0.0001)
Standardized King-Wu	12.21853	-1.374744	2.140111
	(0.0000)	--	(0.0162)
Gourieriou, et al.*	--	--	81.03740
			(< 0.01)

The Random Effects Model (REM) in Table 4 is more suitable than the Common Effects Model (CEM), as evidenced by the p-value of 0.0000, which is less than 0.05, as determined by the Lagrange Multiplier test in Table 4. The most suitable model for this investigation was the REM.

4.3 Classical Assumption Test

Table 5. The multicollinearity test

	Y	X_1	X_2	X_3	M
Y	1.000000	0.580622	-0.287281	0.092772	0.246371
X_1	0.580622	1.000000	-0.149181	0.247417	-0.048382
X_2	-0.287281	-0.149181	1.000000	-0.014795	-0.446352
X_3	0.092772	0.247417	-0.014795	1.000000	-0.267933
M	0.246371	-0.048382	-0.446352	-0.267933	1.000000

The multicollinearity test results in Table 5 indicate that the correlation coefficients among the independent variables are all less than 0.85, implying that there is no significant multicollinearity issue.

4.4 Heteroskedasticity Test

Table 6. The heteroskedasticity test

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	2.866188	2.702774	1.060462	0.2951
X_1	8.542537	4.885946	1.748390	0.0879
X_2	-0.024291	0.016546	-1.468025	0.1497
X_3	-0.073486	0.065905	-1.115028	0.2713

The heteroskedasticity test using the Glejser test in Table 6, the p-values 05 for all independent variables are > 0.05, indicating no heteroskedasticity in the data.

4.5 Normality Test

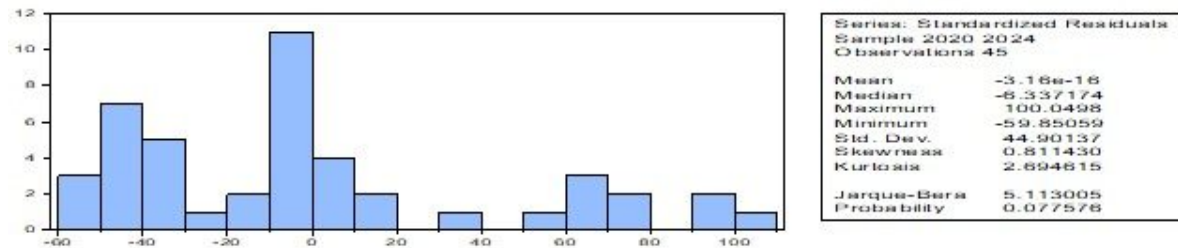


Figure 2. Normality test

The normality test result based on Figure 2 reveals a Jarque–Bera probability of 0.077576, exceeding the threshold of 0.05. This suggests that the datasets conformed to a normal distribution.

4.6 Multiple Linear Regression Analysis of Panel Data

Table 7. Multiple linear regression analysis of panel data

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	28.15780	11.08405	2.540390	0.0160
X_1	53.63404	22.92364	2.339683	0.0255
X_2	0.010632	0.003015	3.525908	0.0013
X_3	0.115814	0.022568	5.131877	0.0000

Table 7 presents the results of the partial statistical analysis, which reveal that:

Green Banking's Impact on the Financial Stability of Islamic Banks. The Green Banking variable shows a positive coefficient of 53.63404 in the regression results. This indicating that strengthening green banking policies can improve Islamic banks' financial stability ([Hossain, Rahman, Hossain, & Karim, 2020](#); [Wongso, Helsa, & Panggabean, 2023](#); [Umam, Khusnia, Wibisono, & Hunafaa, 2025](#)). The Z-score metric indicates that green banking substantially improves banks' financial stability, as evidenced by the empirical results. Consequently, Hypothesis 1 is approved.

Green banking implementation is not only focused on reducing environmental damage but also has the potential to increase operational efficiency and profitability in banks, especially when leveraging technology, such as digital services, in Islamic banks. This encourages product improvement, competitiveness, and operational and financial efficiency, and can help reduce costs. ([Wongso et al., 2023](#)). Thus, the bank's costs decrease, thereby increasing its profit ([Ratnasari, Surwanti, & Pribadi, 2021](#)).

Islamic banks can potentially outperform conventional banks in implementing green banking through various mechanisms. Islamic banking principles, such as profit-loss sharing and the prohibition of riba and gharar, promote cautious risk management, transparency, and ethical conduct, thereby supporting sustainable investments. Islamic banks' focus on social and environmental issues aligns with the maqasid al-sharia, thereby increasing stakeholder trust. The mechanisms include the following: Islamic financing focuses more on green projects with profit-sharing schemes and the development of products such as green sukuk to support environmentally friendly project funding. Green banking in Islamic banks can boost financial stability while supporting sustainability.

The bank's reputation will grow as a result of implementing and publishing green banking practices, which will impact its sustainable financial performance. The goal of implementing and presenting green banking policies in banks' financial statements is to show that Islamic banks may be beneficial in addition to seeking profit, which will support the business's viability. This is in line with stakeholder theory.

ESG Performance Impact on the Financial Stability of Islamic Banks. A considerable positive impact is indicated by the ESG 's positive coefficient of 0.010632 and p-value of $0.0013 < \alpha = 0.05$.

This result suggests that banks' financial stability is positively and statistically significantly impacted by ESG performance. This implies that improved ESG Performance is correlated with increased stability in Islamic banks. The findings align with ([Tarmuji, Maelah, & Tarmuji, 2016](#)). The positive impact of ESG on corporate finance appears to be stable over time. Therefore, the second hypothesis is accepted as true.

ESG investment can improve investment optimization by fostering better, more objective, and transparent business conditions. A company's integrity and stakeholder trust can be improved through ESG investment. According to stakeholder theory, an organization must serve the interests of different stakeholders to maintain its legitimacy and long-term viability. Active adherence to ESG principles in banking fosters trust and acts as a kind of accountability.

ESG (Environmental, Social, and Governance)-oriented investment has grown rapidly. Several nations have incorporated ESG considerations into all investments. ESG investment started in Indonesia in 2009 when ESG standards were added to finance, enabling the development of better, more transparent, and objective business conditions for maximizing investment operations by integrating environmental, social, and governance elements beyond financial measures.

The Intellectual Capital Impact on the Financial Stability of Islamic Banks. The regression analysis indicates that intellectual capital has a positive coefficient of 0.010632 and a p-value of 0.0013, which is less than $\alpha = 0.05$, suggesting a positive relationship with the dependent variable. The third hypothesis is supported by the substantial and favorable effect of value-added intellectual capital on bank financial stability (Z-score). This is consistent with resource-based theory: intellectual capital is a strategic resource that facilitates the generation of added value for the firm, thereby indicating a competitive advantage over competitors. Thus, it shows that intellectual capital positively affects banks' financial stability. The findings of this study are consistent with earlier research ([Rahajeng & Hasibuan, 2020](#)) and ([Caesar & Isbanah, 2020](#)); ([Hapsary, Rini, & Kusumowati, 2026](#)).

Through intellectual capital, a company can increase its competitiveness, thereby improving its performance and creating financial stability. Intellectual capital becomes a company's asset, involving the utilization of resources. Within intellectual capital, there are several components: human capital, comprising skills, competencies, and innovation; organizational capital, comprising facilities that support employee and company activities; and customer capital, which is the value created from the sale of products or services produced by the company. Companies that manage their intellectual capital improve performance, which enhances company value in investors' eyes, attracting investment and, in turn, increasing stock prices and the company's value.

Islamic banks prioritize capital, including physical capital and financial constraints, as low ([Rahajeng & Hasibuan, 2020](#)). Compared with conventional banks that achieved the Top Performance category and had an average value-added intellectual capital score above 4.00, Islamic banks had an average score above 3.00. This is understandable, considering that Islamic banks are still relatively new and need time to develop their intellectual capital. Nevertheless, Islamic banks have grown rapidly, competing with conventional banks, and have achieved a VAIC score above the average of 3.00. Companies that maintain their competitive advantage deliver benefits by managing high intellectual capital as well as physical and financial resources.

4.7 GCG-Moderating Variables on the Dependent Variable (Bank Financial Stability)

Table 8. GCG as a moderating variable on bank financial stability

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-65.32744	46.83345	-1.394889	0.1707
X_1	104.0680	47.33123	2.198717	0.0337
X_2	0.052540	0.050588	1.038587	0.3052
X_3	0.133470	0.124617	1.071042	0.2906
M	4.685017	1.999371	2.343245	0.0242

The regression analysis in Table 8 reveals that good corporate governance has a positive coefficient of 4.685 and a p-value of 0.024, which is less than $\alpha = 0.05$. This indicates that GCG has a significant positive impact on bank financial stability (Z-score). Therefore, the fourth hypothesis is accepted as true. The financial stability of a bank can be improved through the effective implementation of Good Corporate Governance (GCG). Good GCG can enhance transparency and accountability, thereby increasing investor and customer confidence in banks. Furthermore, GCG can help banks manage risks more effectively, thereby reducing the likelihood of bank failure. GCG implementation can also help banks improve operational efficiency, thereby increasing profitability and financial stability (Firdaus, Mariana, Diana, Alfianti, Saputra, & Aztari, 2025 and Dewi, & Nirmalasari, 2025).

Stakeholder Theory emphasizes a company's duty to prioritize all stakeholders' interests, including those of investors, customers, and the community. The resource-based View (RBV) theory suggests that effective GCG serves as a valuable and unique resource, enhancing banks' competitive advantage and contributing to their financial stability. Integrating Sharia principles with modern oversight mechanisms allows banks to maintain public trust and improve service quality. The GCG principles can be applied consistently across all Islamic banking activities, with the strengthening of organizational structure and supervision emphasizing the active roles of the Board of Commissioners, directors, and Sharia Supervisory Board. Consolidating work culture and human resources also helps align operational standards and build internal awareness of the importance of governance. Optimizing information systems and technology supports transparency, report accuracy, and risk management, while protecting and involving stakeholders ensures that the principle of fairness is applied to all. Continuous evaluation and improvement ensure adaptability, effectiveness, and competitiveness. With integrated implementation, this strategy can strengthen GCG's foundation of GCG, maintain operational consistency, and boost public trust, as well as the competitiveness and stability of Islamic banking.

4.8 Moderated Regression Analysis (MRA)

The moderating variable's effect was analyzed using Moderated Regression Analysis (MRA) is presented in Table 9

Table 9. Moderated Regression Analysis (MRA) results

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-571.0234	170.2029	-3.354956	0.0018
X_1	325.1477	314.3330	1.034405	0.3077
X_2	1.488420	1.018712	1.461080	0.1524
X_3	16.34863	3.703878	4.413922	0.0001
M	39.05161	11.92571	3.274573	0.0023
MX_1	-12.70751	21.84579	-0.581691	0.5643
MX_2	-0.135566	0.087972	-1.541004	0.1318
MX_3	-1.162302	0.260845	-4.455915	0.0001

4.8.1 MRA Test Results

4.8.1.1 The impact of Green Banking on Financial Performance is Moderated by Good Corporate Governance (H5)

The regression results reveal that the Green Banking variable (X_1) has a coefficient of -12.707 and a p-value of $0.564 (> 0.05)$, indicating an insignificant effect. Good Corporate Governance (GCG) does not have a moderating effect because it focuses more on governance and supervision, whereas green banking focuses more on environmental and social aspects. This finding shows that formal oversight structures, such as independent commissioners, are not yet effective in guiding the implementation of green banking to enhance the economic value of Islamic banks. Based on stakeholder theory, green banking should help strengthen environmental issues. The GCG should ensure that environmental information is integrated into strategic decision-making, not just administrative reporting. However, the research results show that GCG remains limited to formal compliance and has not played a

strategic role. It lacks competence in sustainability and the environment; therefore, it cannot align green banking with the company's financial strategy. These results are consistent with studies by ([Bangun, Astuti, & Satria, 2024](#); [Ruhiyat, & Kurniawan, 2024](#)).

4.8.1.2 The Impact of ESG Performance on Financial Performance is Moderated by Good Corporate Governance (H6)

The regression results indicate that ESG performance (X_2) yields a parameter coefficient of -0.1355 with a p-value of $0.1318 (> 0.05)$. These results indicate that GCG has not effectively strengthened the contribution of ESG performance to banks' financial stability. Although Islamic banking already has a formal good governance structure, the role of supervision by independent commissioners tends to be merely administrative, focusing solely on compliance with regulations rather than developing sustainability strategies directly integrated with the company's financial goals. If ESG improvement initiatives are carried out merely as a normative obligation without awareness of the value of the strategy, their impact on financial performance is limited.

The results suggest that GCG in Islamic banking does not function as a strategic catalyst. In Islamic banking, although there is already a supervisory function, it has not been able to play an active role in integrating environmental sustainability and financial stability. One possible explanation is the limited ESG-related expertise and lack of incentive mechanisms that connect environmental performance with financial results. [Rahmadiyah, Fadhurrahman, and Sahat \(2026\)](#) shows that GCG supervision mainly focuses on financial reporting and legal requirements, while sustainability issues are not yet a main part of the board of commissioners' strategic agenda.

4.8.1.3 The Impact of Intellectual Capital on Financial Performance is Moderated by Good Corporate Performance (H7)

The coefficient for the intellectual capital variable (X_3) is -1.1623 , with a significance level of $0.0001 (> 0.05)$. GCG moderates the link between intellectual capital and financial stability, optimizing the strategic role of intellectual capital in supporting Islamic banks' financial stability. Based on stakeholder theory, the management of intellectual capital is part of a company's responsibility to meet stakeholders' expectations sustainably and create added value. The results of this study indicate that GCG in Islamic banks has not been able to create strategic roles, such as directing or evaluating, or possibly due to inadequate development of intellectual capital management within the organization, thereby improving financial stability.

This may be because the role of GCG in Islamic banks generally still focuses on regulatory compliance and serves only as administrative supervision, leaving its role in managing intellectual assets to be suboptimal. This leads to a lack of understanding of how to create financial stability in Islamic banks. Strict GCG can also limit Islamic banks' ability to manage and supervise intellectual capital, thereby reducing their capacity to improve financial stability. This finding aligns with [Hasan, Zamzam, Ali, and Zainuddin \(2025\)](#) but contrasts with [Anggriani and Dewi \(2021\)](#) which show that GCG is able to strengthen the relationship between intellectual capital and financial performance.

The findings of this study emphasize the importance of independent commissioners within the framework of Good Corporate Governance (GCG) in overseeing compliance and strategically managing intellectual resources to augment competitive advantage and financial performance.

5. Conclusions

5.1 Conclusion

Based on the testing and analysis results, the findings reveal that green banking has a significant positive effect on financial stability. Similarly, ESG performance and intellectual capital also demonstrate significant positive impacts on banks' financial stability. Furthermore, Good Corporate Governance (GCG) positively and significantly influences bank financial stability. However, the results indicate that GCG does not significantly moderate the relationship between green banking and financial stability, ESG performance and financial stability, or intellectual capital and financial stability. These findings suggest that while GCG plays an important direct role in enhancing financial

stability, its moderating role in strengthening the effects of green banking, ESG performance, and intellectual capital remains insufficient. The operational activities of a Sharia bank must consistently focus on the management of intangible assets, including green banking policies and the enhancement of its intellectual capital, as these are interconnected with performance and operational efficiency improvements, thereby creating a competitive advantage and achieving maximum profits.

5.2 Research Limitations

This study focuses on Indonesian Shariah banks. Therefore, the results may not be generalizable to other countries. Unobserved variables (endogeneity) may also influence ESG and financial stability.

5.3 Suggestions and Directions for Future Research

This research can be further developed by exploring other variables, extending the period, and using additional research methods to make different contributions. In addition, future studies could expand the research scope by comparing green banking and intellectual capital policies in conventional and Islamic banking or conducting cross-country analyses to provide more comprehensive insights. Future research may also consider incorporating institutional, regulatory, and technological factors to better understand the dynamics of sustainable banking practices.

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Author Contributions

LA contributed to the conceptualization, study design, manuscript drafting, and supervision of the research. NAY contributed to data collection and data analysis. A. contributed to data collection and manuscript drafting. ARPA contributed to data collection and manuscript drafting. All authors contributed to the revision process and approved the final version of the manuscript.

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