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THE ROLE OF ISLAMIC CORPORATE GOVERNANCE IN REDUCING SHARIA BANK FINANCING RISK IN INDONESIA

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ABSTRACT

This study examines Islamic Corporate Governance (ICG), proxies by Sharia Supervisory Board, in mitigating the negative impact of Murabahah, Mudharabah, and Musyarakah financing on Non-Performing Financing (NPF) in Indonesian Islamic banks (2012–2023). This study employs purposive sampling to analyze 132 Islamic bank data from the Financial Services Authority (OJK) (2012–2023). Using Moderated Regression Analysis (MRA) the model testing panel static regression model by adding ICG as moderating variable. Murabahah, musharakah, and mudharabah significantly increased NPF, indicating the high financing risk of these contracts. ICG has a significant direct effect on lowering NPF, but does not moderate the relationship between financing and NPF significantly. This shows that increasing the number of ICG without adequate quality and coordination is not effective in strengthening the supervisory function, because it can cause overlapping tasks, coordination problems, and free riding behavior which actually weakens financing risk control. In summary, bank's need to maintain their financing, especially for Murabaha and Musyarakah products. Further, considering to choosing expert ICG might help banks to break the NPF. The implication of this study is that while different sharia financing schemes significantly affect credit risk in Islamic banking, the Sharia Supervisory Board plays a crucial yet non-moderating role, highlighting the need to enhance its authority and operational involvement to strengthen risk mitigation efforts.

INTRODUCTION

Since 1992, Islamic banking has become an important part of Indonesia's banking sector, not only to meet the needs of the Muslim community but also to support the economy, especially in times of crisis. Islamic banks are growing rapidly, and according to OJK 2024 data, by the end of 2023 their market share will reach 6-7%. This growth shows the increasing public acceptance of Islamic banking, which offers an ethical and stable alternative in accordance with Sharia principles. It is estimated that the contribution of Islamic banking to the national economy will continue to increase.

Non-Performing Financing (NPF) is one of the main indicators used to assess bank performance, including in the context of Islamic banks. As non-performing financing increases, the risk of declining profitability also increases, which in turn can reduce banks' ability to expand financing and reduce financing volumes. High NPFs can negatively impact bank profits and increase profit sharing rates, while low NPFs tend to encourage increased profits and profit sharing rates (Nura, I., Nurlaila 2023). In the context of Islamic banks, agency theory can help explain the relationship between management and fund owners, where the inability to effectively manage NPFs can result in information imbalances and mismatches of interests. However, other studies show that NPF is not always effective or significant in influencing the distribution of Mudarabah deposit income in Bank Mandiri Syariah, which can indicate the existence of other factors that affect the performance of Islamic banks (Ramadani, Muh. F. 2021); Oktaviani, NR, & Riyadi, 2021).

The development of Net Non-Performing Financing (NPF) from 2020 to 2023 shows a positive trend. In 2020, Net NPF was recorded at 1.57, indicating a fairly high level of non-performing financing. However, in 2021, there was a significant decline to 0.81, reflecting improved financing quality and better risk management. This downward trend continued in 2022, with Net NPF reaching 0.64. In 2023, Net NPF remained stable at 0.64, indicating that financial institutions have managed to maintain their financing quality at a low and consistent level. This data shows the success of financial institutions in managing the risk of problematic financing and maintaining the NPF Development.

Table 1

NPF Development

Year	2020	2021	2022	2023
Net NPF	1,57	0,81	0,64	0,64

Source: (OJK, 2024)

The latest data shows positive developments in the Islamic banking industry. In February 2024, total assets of Islamic commercial banks increased from IDR 525,393 billion in February 2023 to IDR 586,591 billion, or an increase of around 11.7%. This increase in solid operational capacity points to growing demand for Islamic banking services in Indonesia as well as their growth reflecting increasing trust in them. Indicating growth in this sector, 13 Islamic commercial banks in February 2023 counted to 14 banks in February 2024. Reflecting efforts to provide customers access from various locations and increase service coverage, the number of Islamic banking offices also grew from 2,002 offices to 2,008 offices during the same period.

Table 2
Development of the Islamic Bank Industry

Sharia Commercial Bank Indicators	2023 Feb	2024 Feb
Total Assets (in billions of IDR)	525 393	586 591
Number of Banks	13	14
Number of Offices	2 002	2 008

Source: (OJK, 2024)

Based on Law No. 10 of 1998 concerning Islamic Banking, financing is defined as the provision of funds or bills that are equated with funds, which are provided based on an agreement between the bank and another party. Along with a return in the form of profit or profit sharing, this agreement mandates the beneficiary of the funding to return the money or bills within a certain period of time. Murabahah finance in Islamic banking is a kind of buying and selling transaction with a pre-agreed profit estimate. Though at first not the primary source of funding, murabahah is often utilized as a substitute for the interest system and as a transitional tool towards an economic system compliant with sharia standards. (Khasanah et al., 2021). Musyarakah finance, on the other hand, is a kind of collaboration wherein two or more people share money and face the consequences depending on the agreement expressed in the contract (Kasmawati et al., 2022). Since the possible profit or loss is somewhat small, increasing this kind of financing may help to improve profitability. Mudharabah finance, on the other hand, is an investment contract wherein the client offers knowledge to oversee a certain project while the bank offers funds. Here the consumer serves as the manager (mudharib), but the bank owns the money (shahibul maal) (Widarjono & Rudatin, 2021).

In a mudharabah partnership, the customer acts as a mudharib, or manager; the bank acts as a shahibul maal, funding the client's company entirely. Developing public trust in the financial industry depends critically on good governance measures. This provides sustained management performance, effective use of resources, successful investment plans, and professional reporting, which may at last assist to minimize information asymmetry and finance problems. Studies by Mutamimah & Saputri (2022) show how corporate governance helps to reduce financing risks. Putri & Pratama (2023) also claimed that corporate governance might help to reduce the impact of mudharabah finance on financing risks.

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Previous studies revealed conflicting results on the link between financing forms and financing risks, therefore pointing out research gaps. For instance, research by Khasanah et al. (2021) shows that non-performing financing (NPF) is much influenced by Murabahah funding. Research by Saputri & Ahmadi (2022) nevertheless indicates that the NPF ratio in Islamic banks did not rise in 2020 and 2022; this is hypothesised to be the result of other causes. In contrast to the results this impact on Islamic commercial banks, the Saputri & Ahmadi (2022) research demonstrates that Mudharabah financing has a considerable and beneficial influence on NPF at BMT Hasanah Ponorogo. This discrepancy drives scholars to include sharia corporate governance as a moderation variable, a new variable. This moderation variable is crucial as the management of Islamic businesses is supposed to explain the variations in the impacts of many kinds of financing risks on financing. Examining the function of Islamic corporate governance in lessening the negative effect of financing on NPFs in Islamic banks would help to provide a better knowledge of the elements influencing financial stability in the Islamic banking industry.

Agency theory explains the relationship between the principal (owner) and the agent (manager), where agents often have greater access to information, causing information asymmetry (Jensen & Meckling, 1976a). In Sharia banking, to overcome information asymmetry and moral hazards, the Sharia Supervisory Board (DPS) plays an important role. The Sharia Supervisory Board (SSB) plays a role in ensuring that all banking activities are carried out in accordance with sharia principles, thereby minimizing the risk of misuse of information. The Sharia Company Theory also emphasizes the importance of a balance between individualistic and altruistic values in running a business (Alfarago et al., 2023). In this context, the SSB supports the implementation of Islamic ethical values in bank operations, which can ultimately reduce the potential for moral hazard and improve the welfare of stakeholders.

To fill this gap, this study adds a new variable, namely sharia corporate governance, as a moderation variable. This variable was chosen because sharia corporate governance can play a role in controlling and reducing the negative impact of financing risks on NPFs. Strong governance of Islamic companies can increase transparency, reduce the risk of moral hazard, and increase the stability of the Islamic banking sector (Khan & Zahid, 2020; Mutamimah & Saputri, 2022). Thus, this study aims to examine the role of sharia corporate governance in reducing the negative impact of financing on NPFs in Islamic banks, in order to provide a deeper understanding of the factors that affect financial stability in the Islamic banking sector.

The next step in this study is to conduct an empirical analysis using Islamic banking data from 2018 to 2023. This analysis will examine whether sharia corporate governance plays a role as a moderating factor that clarifies the relationship between financing and NPF risk. Thus, this research is expected to make theoretical and practical contributions in the field of Islamic finance and provide recommendations for regulators and the Islamic banking industry in improving the effectiveness of Islamic corporate governance.

LITERATURE REVIEW

Agency Theory

Introduced by Jensen & Meckling (1976b), agency theory clarifies the dynamics between corporate owners (principals) and managers (agents), where information imbalance is a typical problem. Usually, agents have more thorough operational knowledge than the principals, so there is an information imbalance. This disparity might cause moral hazard, in which case agents might behave in their own best interest instead of giving the principles top priority. But as Sarma et al. (2024) point out, using sharia-compliant contracts inside this relationship structure not only helps reduce moral hazard but also helps limit risks resulting from unequal knowledge. Practically, openness and responsibility are greatly enhanced by regular sharia supervision mixed with voluntary risk disclosure. In the end, ethical norms and trust-based well-managed principal-agent relationships improve the whole value of Islamic banking institutions and help to provide more financial stability.

In banking, risk-taking cannot be stopped, hence appropriate risk disclosure is crucial. Agency theory is a pertinent theoretical viewpoint in this regard as well as one that helps identify elements influencing risk disclosure (Dahlifah & Sunarsih, 2020; Segarawasesa, 2021). Control of hazards resulting from principal-agent relationships depends critically on the Sharia Supervisory Board (SSB) and sharia disclosure systems such the Sharia Social Responsibility Disclosure (ISR). In the literature, agency theory has also been attacked on irrelevant factors of risk disclosure, such demographic features. This theory also relates to other factors of risk disclosure, such top management independence, which, based on (Dahlifah & Sunarsih, 2020) can boost information openness by means of interpersonal skills and great expertise. Still, the emphasis on risk committees in risk disclosure is still low; so, more study is required to close the discrepancy (Nahar et al., 2020; Puspasari et al., 2024).

Islamic Bank Financing Risk

One important factor that may have an impact on Islamic banks' financial stability is financing risk. This risk occurs when clients don't pay as agreed upon, which could lower the bank's profitability and asset quality (Kasmawati et al., 2022). When evaluating the health of banks, particularly Islamic banks, non-performing financing (NPF), which is defined as financing that debtors do not repay within 90 days without making principal or margin payments, is a crucial metric.

Macroeconomic variables like unemployment, inflation, and interest rates, as well as debtor attributes like credit history and payment ability, are some of the elements that influence the degree of financing risk in Islamic banks. The degree of financing risk is also influenced by internal bank variables like capital level, liquidity, and cost effectiveness. High capital and liquidity banks are typically better at managing risk, whereas cost inefficiencies can make risk profiles worse, lower profit margins, and make it harder for banks to deal with possible defaults (Ali et al., 2020; Widyakto et al., 2023).

The primary metric used to evaluate the asset quality of Islamic banks is net performing financing, or NPF. While a low NPF score suggests a rise in credit risk as a result of the customer's noncompliance with payment obligations, a high NPF score indicates good financing quality and low risk. According to Garcia-Appendini and Montoriol-Garriga (2013), this condition may have an impact on banks' overall financial stability as well as lower investor and customer confidence. In order to lower financing risks and enhance assets, Islamic banks must thus put in place a stringent monitoring system and financing restructuring plan.

When it comes to financing risk management in Islamic banks, agency theory offers pertinent insights. The relationship between the owner (principal) and the bank manager (agent), where a possible conflict of interest may affect the decision to provide financing, is explained by this theory. While bank managers may have different incentives, such as seeking greater financing growth, bank owners may have different goals, such as controlled risk and maximum returns. Consequently, lowering the possibility of conflicts in decision-making and raising the caliber of Islamic banks' NPFs depend heavily on the application of efficient risk management. Islamic banks can guarantee the stability of the financial system and the long-term viability and profitability of the financing they offer by implementing an appropriate risk management plan.

Islamic Corporate Governance

Islamic Corporate Governance (ICG) emphasizes the need of following Sharia law especially in making sure that business transactions are rooted on actual assets. Real asset-based transactions are seen as more moral and strong, and the possibility of speculative activity against Sharia values is so lessened. The Sharia Supervisor Board (DPS) lays the basis of this governance system by means of whose direction management and personnel are guided and monitoring is done to assure compliance with the bans on riba (interest) and gharar (uncertainty). Real asset-based enterprises can attain increased stability and sustainability by means of effective application of Islamic Corporate Governance (ICG), thus enhancing risk management and so helping to enhance the Islamic financial system (Hamid et al., 2021; Suhendar et al., 2023).

Within the framework of agency theory, ICG helps to resolve possible conflicts of interest between management (agents) and owners (princelings). Refrain from riba and gharar is one of the sharia values that the Sharia Supervisory Agency (SSB) ensures sure bank or corporate management applies in their operations. The presence of SSB reduces the possibility that management will engage in opportunistic behavior, such as pursuing immediate financial gain at the expense of long-term objectives and sharia law. Stakeholder trust in the Islamic financial system can be increased by improving transparency and accountability in company management through a robust supervisory mechanism (Ma'ruf & Wulandari, 2023; Mutamimah & Saputri, 2022).

Islamic Corporate Governance (ICG) has several advantages, but its acceptance is hampered by a lack of information among management about Sharia principles and by different legal interpretations resulting from them as well. Thus, if appropriate education and training are given, the effectiveness of ICG implementation can be raised. Good implementation of ICG not only guarantees sharia compliance but also improves the company's image, attracts fresh investors, and helps long-term financial performance (Kuanova et al., 2021). More research is needed to ensure that sharia values remain relevant in the face of the dynamism of the modern financial sector and to build an ICG model more adaptable and sensitive to changes in the corporate environment.

HYPOTHESIS

Murabahan Financing towards NPF

One of the primary tools in sharia banking is murabahah financing, which carries financial risks in the event that the mudarib defaults on the loan. Mutamimah & Saputri (2022) found that Islamic banks are less exposed to risk in murabahah transactions than in musyarakah and mudharabah financing. This is so because murabahah finance provides predictable income and a more simple approach while negatively affecting financing risk. This hypothesis is based on the belief that reducing the risks connected with murabahah financing will reduce the possibility of developing non-performing loans (NPLs), therefore supporting the stability and financial performance of Islamic banks. The following theories can be put forth in light of the theoretical framework and empirical data:

H1: Murabahah financing has a significant influence on Non-Performing Financing (NPF) in Islamic banks.

Musyarakah Financing of NPF

Two or more people decide to manage a business jointly in a musyarakah; each provides capital, and they split the profits and losses based on their individual efforts. Rifqi et al.'s (2024) study mostly examined profit-sharing-based financing; it also examined the ratio of musyarakah to mudharabah financing to non-profit financing. The study reveals that funding under a profit-sharing plan reduces Islamic banks' credit risk (CR). Using information from 51 Middle Eastern banks, Rifqi et al. (2024) investigate how profit-sharing and sectoral funding ratios affect NPF. By increasing profit-sharing-based funding, this work demonstrates how GMM dynamic panel data techniques might let Sharia banks reduce credit risk. These findings confirm the hypothesis that raising Musharakah financing would lower the non-performance loan

count in Sharia banks; consequently, Musharakah financing has a negative effect on NPF.
H2: musyarakah financing has a significant impact on NPF.

Mudharabah Financing on NPF

In mudharabah, one party provides management services for another party's business in return for a predetermined portion of the profits; the financier is responsible for any losses. Mudharabah financing can lower credit risk (NPF) in Islamic banks, according to research by Mutamimah & Saputri (2022). A high NPF, however, suggests that care must be taken when doing a financing analysis. According to this finding, NPF has an impact on mudharabah. According to the hypothesis, if mudharabah financing is increased with careful analysis, the NPF will decrease.
H3: mudharabah financing has a significant impact on NPF.

Murabahah financing on NPF is moderated by Islamic Corporate Governance

Murabahah financing, one of the primary instruments in Sharia banking, entails the risk of losing money in the event that the borrower defaults on the loan. However, the risks involved with Murabahah are generally lower than those of Musyarakah and Mudharabah financing. This is so because murabahah has a fixed income, simplifies matters, and has a less negative effect on financing risk (Mutamimah & Saputri, 2022; Zamroni et al., 2023). The lower risk connected with murabahah financing is projected to help the stability and profitability of Islamic banks by reducing the probability of Non-Performing Financing (NPF). Thus, a hypothesis is developed.
H4: The Sharia Supervisory Board (DPS) is significantly moderate the relationship between Murabaha Financing and Non-Performing Financing (NPF).

Musyarakah financing on NPF is moderated by Islamic Corporate Governance

A method known as " Musharakah financing" is the management of a company under the cooperation of two or more people, each lending a certain capital contribution. The capital supplied determines each party's share of loss; the agreement specifies a profit distribution mechanism. The Sharia Supervisory Board (DPS) does not have direct control over ROA, although DPS greatly participates in controlling the link between NPF and ROA. By DPS, the probability of fund disbursement is lowered and the impact of NPF on Musyarakah is strengthened thereby guaranteeing rigorous procedures and respect to Sharia values. Effective DPS management finally helps a company's financial performance—especially its return on assets—to be enhanced, so enabling better NPF control. The results of Wahyudi (2020), whose study emphasizes the crucial part DPS plays in improving financial performance by means of better control, confirm these conclusions.
H5: The Sharia Supervisory Board (DPS) significantly moderates the relationship between Musyarakah Financing and Non-Performing Financing (NPF).

Mudharabah financing on NPF is moderated by Islamic Corporate Governance

In a mudaraba, a capital provider pays the management services of another party's company in return for a share of the income, therefore bearing any risk. By means of research by Mutamimah & Saputri (2022), mudharabah financing can reduce credit risk (NPF) in Islamic banks. Still, the high NPF emphasizes the need of using prudence while doing a finance study. Research by Mutamimah & Saputri (2022) indicates, however, that a high NPF can influence the effectiveness of mudharabah finance. Therefore, the theory put here is that the NPF can be lowered by increasing mudharabah finance, provided DPS supports critical analysis and effective oversight.

H6: The Sharia Supervisory Board (DPS) is significantly moderate the relationship between Mudharabah Financing and Non-Performing Financing (NPF).

Conceptual Framework

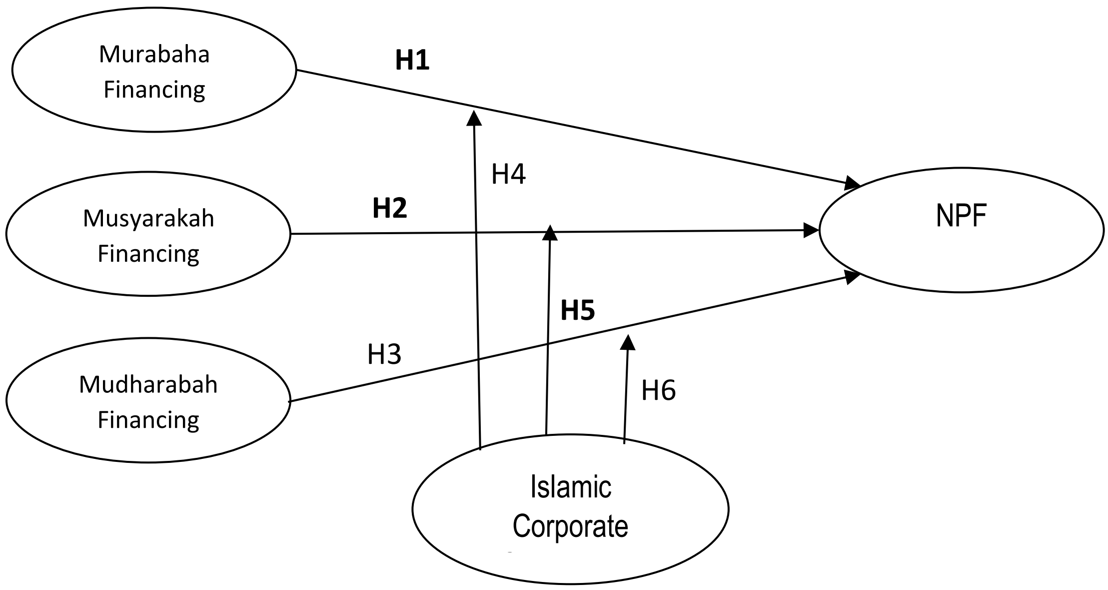

Figure 1. Conceptual Framework

RESEARCH METHODS

This research is an explanatory research that aims to affirm or deny beliefs about Islamic finance. The research population consists of all banks registered in Indonesia, with a focus on Islamic Commercial Banks, not just banks that have sharia services. The list of banks used in this study was obtained from the Financial Services Authority (OJK), that have sharia operational status according to OJK regulations. The sample was selected as many as 132 banks that met specific criteria, namely Islamic commercial banks that operated in the period 2012 to 2023 and had complete financial data that could be accessed. The selection of Islamic Commercial Banks is based on the nature of their operations which are fully based on sharia principles, which is more relevant for research examining financial performance as well as types of sharia financing such as Murabahah, Mudharabah, and Musyarakah. The purposive sampling method is used to select samples based on predetermined criteria, such as banks that have data related to total financing and types of sharia financing. The data used includes the total financing issued by Islamic banks as well as the proportion of Murabahah, Mudharabah, and Musyarakah financing.

Table 3
Sample Criteria

Not	Selection Criteria	Number of companies	Note
1	All banks, including conventional and sharia from the OJK (2012–2023)	119	Preliminary data based on OJK
2	All Islamic banks registered with the OJK (2012-202) (based on OJK status and annual report)	14	Selection based on sector classification and sharia status
3	All banks with complete financial data, both annual reports and financial data available (2012–2023)	11	Companies that meet the criteria for consistency and data availability
Final result	–	**11**	–

With the hypothesis that its presence influences the connection between banks' financial performance and the kind of sharia financing they provide, this study also looks at the role of the Sharia Supervisory Board's (SSB) moderation. The effects of this moderation are evaluated using Moderating Regression Analysis (MRA), which combines cross-sectional and time-series data using panel regression for a more thorough analysis (Greene, 2018). Because MRA can control unobserved variables, it was chosen to increase the validity of the results. Stata is used for data analysis in order to streamline processing and increase the precision of the outcomes. Validity and reliability tests are performed on the data prior to analysis. To make sure the regression model satisfied the requirements for additional analysis, the traditional assumption tests of autocorrelation, multicollinearity, heteroskedaness, and normality were also carried out. To ensure consistency and clarity in interpretation, the methodology describes the operational definition of every variable, including DPS indicators and sharia financing types.

Table 4.
Operational Definition of Variables

Research Variables	Indicator	Measurement Scale	Data source	Operational Definition	Reference
Sharia Corporate Governance (ICG)	The size of the Sharia Supervisory Board (Sharia Supervisory Board)	Ratio	Bank Annual Report	The role of the Sharia Supervisory Board in supervising financing in accordance with sharia principles.	Kartika et al. (2022)
Financing Risks	Non-Performing Financing (NPF)	Ratio	Bank Annual Report	The percentage of non-performing financing to total financing.	Darwanto & Chariri, (2019)
Mudharabah Financing Risks	Total Mudharabah Financing	Ratio	Bank Annual Report	The total value of Mudharabah financing, used as a proxy for risk exposure.	Herijanto, (2022)

Research Variables	Indicator	Measurement Scale	Data source	Operational Definition	Reference
Musharakah Financing Risks	Total Musyarakah financing	Ratio	Bank Annual Report	The total value of Musyarakah financing, used as a proxy for risk exposure.	Kasmawati et al. (2022)
Risks of Murabahah Financing	Total Murabahah Financing	Ratio	Bank Annual Report	The total value of Murabahah financing, used as a proxy for risk exposure.	Mutamimah & Saputri (2022)

Based on this research model, the following is a regression equation:

$$Y_{it} = \alpha + \beta_1 X1_{it} + \beta 2 X_{2\,it} + \beta_3 X3_{it} + \beta_4(X1_{it} {*}Z) + \beta 5(X2_{it} {*}Z) + \beta 6(X3_{it} {*}Z) + B7Z_{it} + \varepsilon_{it}$$

In this context, the dependent variable (Y) represents the performance of Islamic commercial banks. The constant is denoted by α, while β1, β2, and so on represent the regression coefficients. The variables X1, X2, and X3 correspond to Murabaha Financing, Musharakah Financing, and Mudharabah Financing, respectively. Additionally, X1Z, X2Z, and X3Z represent the interaction terms, with MUB*DPS, MUY*DPS, and MUD*DPS denoting the interactions of Musharakah, Murabaha, and Mudharabah financing with the Sharia Supervisory Board (DPS), respectively. Lastly, ε represents the error term in the model.

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

The mean, standard deviation, maximum, and Minimun values are the building blocks of descriptive statistics, which provide a high-level overview of the data. Below is a table showing the results of descriptive statistical analysis:

Table 5
Descriptive Test

Variable	Obs	Mean	Std. dev.	Min	Max
NPF	132	1.841	1.640	0.010	5.280
Murabaha	132	0.381	0.184	0.080	0.990
Musyarakah	132	0.319	0.208	0.000	0.780
Mudharabah	132	0.299	0.183	0.000	0.850
DPS	132	2.152	0.381	1	3
Murabaha * DPS	132	0.835	0.469	0.160	2.940
Musyarakah * DPS	132	0.666	0.430	0.000	1.710
Mudharabah * DPS	132	0.650	0.419	0.000	2.130

Source : Stata Output Attached

Based on the results of the descriptive test in table 5, it can be concluded that all research variables have quite varied data distribution, reflecting the diversity of conditions between observation units. The level of Non-Performing Financing (NPF) as a dependent variable shows a wide distribution, indicating a difference in the level of non-performing financing in each Islamic tren institution. Meanwhile, the three types of financing contracts, namely Murabahah, Musyarakah, and Mudharabah, show different proportions of use, with Murabahah appearing to be more dominant, in accordance with the tren of financing practices in the Islamic banking industry. The Sharia Supervisory Board (DPS) variable shows the consistency of values in a limited range, which reflects a relatively uniform structure of sharia supervision. The interaction between each type of contract and DPS showed varying values, hinting at the potential role of DPS moderation in influencing the relationship between the type of sharia financing and the level of non-performing financing. This variation is an early indication that the influence of DPS in strengthening or weakening the influence of contract types on NPF is worthy of further analysis in the regression model.

Multicollinearity Test

The results of the multicollinearity test in table 6 show that all variables in the model have VIF values that are still within the tolerance limit, although some of them are quite close to the threshold that needs to be watched out.

Table 6
Multicollinearity Test

Variable	VIF
Murabaha	2.827
Musyarakah	2.840
Mudharabah	2.827
ROA	1.010
DPS	5.259
Murabaha * DPS	4.515
Musyarakah * DPS	5.431
Mudharabah * DPS	4.254
Mean VIF	3.620

Source : Stata Output Attached

This indicates that there are no serious problems related to multicollinearity between independent variables in the model. Thus, the regression model can be considered free from multicollinearity interference that can affect the accuracy of parameter estimations.

The model selection result, with a value of 0.957 (REM), shows that the chosen model is the Random Effects Model (REM), meaning that this model is more appropriate for panel data where the variation between individuals or units is greater than the variation within the units.

FEM VS REM hausman test table

Table 7
Hausman Test Table

Variable	Coefficient FEM (b)	Coefficient REM (B)	Difference (b-B)	Std. Error
Murabaha	.6441453	.6368509	.0072943	.064909
Musyarakah	.2844384	.1983404	.086098	.0743441
Mudharabah	.5264446	.4664445	.0600002	.0701165
ROA	-.0556638	-.0224002	-.0332636	.108244
DPS	1.951823	-.8777594	2.829582	4.179136
Murabaha * DPS	-.0832976	-.0800679	-.0032298	.0297763
Musyarakah * DPS	.0874803	.1194955	-.0320152	.0306972
Mudharabah * DPS	-.0914199	-.0659977	-.0254222	.0273831

Test of H0: Difference in coefficients not systematic
chi2(0) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 2.59
Prob > chi2 = 0.957

Based on the test results above, The Hausman test result shows a chi-square value of 2.59 with a probability (p-value) of 0.957, which is much higher than the 0.05 significance level. This indicates that there is no significant difference between the coefficients of the Fixed Effect Model (FEM) and the Random Effect Model (REM). Therefore, the Random Effect Model (REM) is the more appropriate model to use in this analysis.

Research Results (Hypothesis Testing)

Multiple linear regression analysis involves the F test to test the combined influence of independent variables and the t test to test the effect of each independent variable separately on the dependent variable. If the probability value (p) ≤ 0.05, an alternative hypothesis is accepted, indicating a significant influence of the independent variable on the dependent variable.

Table 8.
Multiple Linear Regression Test Results

Y (NPF)	Coefficient	Std. err.	t	P>t	[95% conf.	interval]
Murabaha	0.816	0.295	2.760	**0.007**	0.231	1.400
Musyarakah	0.813	0.225	3.620	**0.000**	0.368	1.258
Mudharabah	1.373	0.444	3.090	**0.002**	0.494	2.252
ROA	0.357	0.028	12.79	**0.000**	0.302	0.413
DPS	1.208	0.453	2.660	**0.009**	0.310	2.105
Murabaha * DPS	-0.004	0.004	-1.060	0.291	-0.013	0.004
Musyarakah * DPS	-0.006	0.003	-1.850	0.066	-0.012	0.000
Mudharabah * DPS	-0.011	0.006	-1.660	0.099	-0.024	0.002
_cons	-90.14	31.67	-2.85	0.010	-152.8	-27.44
R-Square						0.8234

Y (NPF)	Coefficient	Std. err.	t	P>t	[95% conf.	interval]
Adjusted R-Square						0.8119
F-Statistic						0.0000
Model Selection						0.957 (REM)

Source : Stata Output Attached

The results of the multiple linear regression analysis carried out in StataMP 17 for Windows. The model chosen for this study is FE/RE model based on the testing of 0.957. indicate the result of xxx is >0.05/<0.05. The Equation can be express as follows:

$$NPF_{it} = -90.14 + \beta_1 0.816 + \beta_2 0.813 + \beta_3 1.373 + \beta_4 1.208 - \beta_5 0.004 - \beta_6 0.006 - B_7 0.011 + \varepsilon_{it}$$

The results of the analysis showed:

- An increase of one unit in murabaha (β1) financing is estimated to increase Islamic bank NPF by 0.816 units, which is significant at alpha 5%. Therefore, the H1 hypothesis is not rejected.
- An increase of one unit in musyarakah (β2) financing is estimated to increase Islamic bank NPF by 0.813 units, which is significant at alpha 5%. Therefore, the H2 hypothesis is not rejected.
- An increase of one unit in Mudharabah (β3) financing is estimated to increase Islamic bank NPF by 1.373 units, which is significant at alpha 5%. Therefore, the H3 hypothesis is not rejected.
- A one-unit increase in DPS (β4) is estimated to increase the NPF of Islamic banks by 1.208 units, which is statistically significant at the 5% level. Therefore, the H4 hypothesis is not rejected.
- When Murabaha (β5) financing is moderated by the DPS, it has a negative impact on increasing Islamic banking NPF, although this effect is not statistically significant. Therefore, the H6 hypothesis is rejected.
- When musyarakah(β6) financing is moderated by the DPS, it has a negative impact on increasing Islamic banking NPF, although this effect is not statistically significant. Therefore, the H6 hypothesis is rejected.
- When mudharabah (β7) financing is moderated by the DPS, it has a positive impact on increasing Islamic banking NPF, although this effect is not statistically significant. Therefore, the H6 hypothesis is rejected.

Overall, the variables able to examine 82% of the model, where the 81% representing on the error term.

Classic Assumption Analysis

Normality Test

The results of the residual normality test in table 8 show that the data distribution does not experience significant deviations from the normal distribution pattern.

Table 9
Normality Test

Variabel	Observasi	Prob(skewness)	Prob(kurtosis)	Adj chi2(2)	Prob > chi2
resid	132	0.9756	0.0836		3.05

Source : Stata Output Attached

This indicates that the residual normality assumption has been met in the model used. Thus, the regression model can be continued because it meets one of the classic requirements in regression analysis.

Heterocedasticity Test

The results of the heteroscedasticity test in table 9 show that the variance error is constant, so there is no indication of heteroscedasticity in the model.

Table 10
Heteroscedasticity Test

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity	
Assumption: Normal error terms	
Variable: Fitted values of y	
H0: Constant variance	
chi2(1)	1.21
Prob > chi2	0.2714

Source : Stata Output Attached

This shows that the assumption of homokedasticity has been fulfilled. Thus, the regression model can be declared stable and can be used for further analysis without the need for special adjustments.

Autocorrelation Test

The autocorrelation test checks for a relationship between disturbance errors in consecutive periods and is essential for linear regression analysis. the Breusch-Godfrey test is commonly used to detect autocorrelation, though its results should be interpreted cautiously due to distribution uncertainties.

Table 11
Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.3813	Prob. F(2,122)	0.802
Obs*R-squared	0.8313	Prob. ChPSquare(2)	0.599

Source : Stata Output Attached

The results of the Breusch-Godfrey test in table 10 show that there is no autocorrelation in the model until the 2nd lag. This is shown by the non-rejection of the null hypothesis that states that there is no autocorrelation. Thus, the regression model fulfills the autocorrelation-free assumption and can be reliably used for further analysis.

DISCUSSION

Murabahah Financing and Its Impact on NPF

The regression analysis reveals that murabahah financing has a statistically significant and positive effect on Non-Performing Financing (NPF), which contrasts with the initial hypothesis positing a negative relationship. This unexpected result can be interpreted through the lens of agency theory, which suggests that in the presence of asymmetric information, moral hazard may arise. Murabahah, as a cost-plus-sale contract, tends to be rigid due to its fixed profit margin and predetermined payment terms. While this theoretically reduces uncertainty for the bank, it may encourage excessive financing without thorough assessment of the borrower's repayment capacity, leading to higher default risks. Previous studies such as those support this outcome, highlighting that murabahah, despite being the dominant product in Islamic banking, often contributes to rising NPF due to its quasi-conventional characteristics and over-reliance on collateral rather than business viability.

Musyarakah Financing and Its Role in NPF

In contrast to the predicted negative relationship, the musyarakah financing variable also demonstrates a statistically significant and positive influence on NPF. According to theory, musyarakah should lower financing risk by implementing shared ownership and risk-sharing guidelines, which is consistent with the fundamental ideas of Islamic finance's risk-sharing theory. However, empirical findings suggest otherwise. This can be attributed to the practical challenges in monitoring and managing joint ventures, especially in the absence of robust internal controls and performance evaluation mechanisms. Empirical research by Mutamimah & Saputri (2022) found that musyarakah is prone to operational risks and information asymmetry, particularly when banks lack the capacity to supervise partner activities effectively. Consequently, such conditions can lead to misreporting, mismanagement of funds, and eventually, non-performance.

Mudharabah Financing and Its Role in NPF

Mudharabah financing, although theoretically the riskiest among Islamic contracts due to its full reliance on the entrepreneur's honesty and business performance, exhibited a statistically significant impact on NPF in this study. This significance suggests that mudharabah plays a meaningful role in shaping NPF, despite being less prominent in Islamic banks' portfolios compared to murabahah and musyarakah. The inherent risks of mudharabah—stemming from its non-collateral nature and the difficulty in ensuring transparency in profit and loss reporting—can contribute to higher default potential when not properly managed. This supports the risk-avoidance behavior theory in Islamic banking, where banks often minimize their exposure to high-risk contracts by limiting mudharabah offerings to highly credible clients. However, Mutamimah & Saputri (2022) have pointed out operational risks and monitoring challenges that may be reflected in the significant effect found in this study. This suggests that even a limited use of mudharabah can materially influence NPF outcomes when internal control mechanisms are inadequate.

The Role of Sharia Supervisory Board (DPS) as a Moderating Variable

Apart from establishing that the Sharia Supervisor Board (DPS) directly and statistically significantly affects non-performance funding (NPF), the regression results demonstrate that a larger supervising presence in their risk management improves Islamic banks. Unfortunately, among Murabaha DPS, Musyarakah DPS, and Mudharabah*DPS, the statistical study revealed no appreciable interaction factors. Hence, DPS has no effect on the link between Islamic financial contracts and NPF even if it helps to reduce credit risk on its own. Institutional theory holds that DPS might be a formal structure set more for legitimacy than pragmatic advantage, hence this conclusion could be the result. Many Islamic financial organizations have DPS members without executive authority to influence daily financing choices, therefore restricting their capacity to control how various funding sources effect credit risk. Mutamimah and Saputri (2022) underline how often limited freedom, a perception of symbolic rather than real control, and lack of technical understanding impede DPS efficacy. Thus, DPS has a statistically minor moderating influence on the association between financing contracts and NPF even if it has a major direct impact.

Recall that even as they debate the business, more DPS members lack essentially better financial management. Research by KK and Maharani (2024) show that an overly high DPS could lead to coordination issues, task overlap, and "free riding," which is the want of certain people to not actively participate in the activity. Within Islamic financial institutions, for example, the efficiency of monitoring depends more on the expertise and quality of DPS members than on their total membership count. Wita et al. (2025) contend that the danger of non-performing financing (NPF) may rise if supervisory operations remain unimproved and the number of DPS rises, therefore complicating risk management generally. In terms of sharia financial management, one should thus give equal weight with their volume DPS's quality and efficiency.

CONCLUSION

The aim of this paper is to investigate the link between NPF in Indonesian Islamic banking and murabahah, musyarakah, and mudharabah finance as well as assess the moderating impact of the Sharia Supervisory Board (DPS). Three forms of sharia financing—mudharabah, musyarakah, and murabahah—found to have a notable effect on NPF: Thus, depending on the form and design of every financing scheme, Islamic banks implicitly assume different degrees of credit risk. Profit- and loss-sharing included in both murabahah and musyarakah clearly affects NPF performance. Mudharabah's significant impact on the fund verifies theoretical estimates of NPF's default susceptibility. It is usually considered as high-risk since it depends on the honesty and knowledge of businesspeople. In addition, DPS shows a statistically significant direct effect on NPF, suggesting that the presence and oversight of the sharia supervisory board contribute meaningfully to mitigating credit risk. However, the interaction terms—MurabahahDPS, MusyarakahDPS, and Mudharabah*DPS—do not produce statistically significant results. This implies that while DPS plays an important independent role, it does not effectively moderate the relationship between specific types of sharia financing and credit risk. This outcome may reflect a limitation in the operational authority or strategic involvement of DPS in the financing approval and monitoring process.

This study has several limitations, including a data scope that may not fully represent the entire Islamic banking industry and the absence of control variables such as macroeconomic conditions or internal bank governance that also influence non-performing financing. Therefore, future research is recommended to explore additional dimensions such as governance structure, integration of digital systems in financing supervision, and a deeper assessment of DPS quality in terms of competence, independence, and active engagement. These improvements are essential for delivering more comprehensive insights and supporting the development of a more resilient Islamic finance system.

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Author Contributions

Khansa Shabihah contributed to the conceptual framework, literature review, and data interpretation. Mutamimah led the methodological design and statistical analysis. Pungky Lela Saputri was responsible for data collection and validation, while Dedi Rusdi contributed to the theoretical model and assisted in refining the discussion and conclusion.

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