

Determinants of the Z-Score Model in Predicting Financial Distress Using the RGEC Component (Empirical Study of Islamic Commercial Banks in Indonesia from 2012 to 2023)

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ABSTRACT

Purpose: The purpose of this study is to examine the effect of RGEC components, as proxied by the variables NPF, FDR, GCG, ROA, and CAR, on *the financial distress* of Islamic commercial banks during the period 2012-2023 using the Z-score method.

Design/methodology/approach: The type of data used is quantitative data collected using *purposive sampling* techniques with *balanced* panel data regression analysis, classical assumption tests, T-tests, and F-tests. The sample in this study consisted of seven Islamic commercial banks in Indonesia for the period 2012–2023, with a total of 84 data points.

Findings: The results of this study indicate that simultaneously, all independent variables have an effect on *financial distress*. Meanwhile, partially, the results show that the CAR variable has a significant positive effect on *financial distress*, the GCG variable has a significant negative effect on *financial distress*, while the NPF, FDR, and ROA variables have no effect on *financial distress*.

Theoretical Contribution/Originality: This study provides a theoretical contribution by integrating RGEC components and the Z-score method of Čihák and Hesse (2010) in predicting financial distress in Islamic Commercial Banks in Indonesia for the period 2012–2023. The uniqueness of this study lies in the use of a Z-score model that is more relevant to the banking sector and a long observation period.

Research limitation and implication: This study is limited by the relatively small sample size and the use of secondary data. The implication is that the results of this study emphasize the importance of strengthening corporate governance and capital adequacy as measures to prevent financial distress and can be taken into consideration by Islamic banking management and regulators.

Keywords: Financial Distress, RGEC, Z-Score, Islamic Commercial Banks, Bank Health, Banking Risk

INTRODUCTION

Financial distress is a condition that often occurs in the business world, including the banking sector, characterized by a significant decline in financial performance and potentially leading to bankruptcy if not addressed immediately (Roberto, 2022). According to Agus (2018), *financial distress* is an indication, early warning, or signal that a company will go bankrupt. Information about *financial distress* that is revealed early on is very important for company management because it provides an opportunity to make improvements and take anticipatory measures. This condition can be fatal for companies that

are still actively operating, so immediate action is needed through *financial distress* prediction in order to minimize the risk of bankruptcy and maintain business continuity.

In an era of economic globalization fraught with uncertainty, *financial distress* has become a crucial issue for financial institutions in Indonesia, particularly in the banking sector. The 2008 global financial crisis, known as *the Subprime Mortgage Crisis*, revealed the weak balance between the banking financial system and risk management, due to the granting of housing loans to borrowers with poor credit backgrounds (Ministry of Communication and Information Technology, 2010). Furthermore, the issue of *the Federal Reserve* raising its benchmark interest rate in 2015 also affected the stability of the national banking system and triggered concerns about a repeat of the 1997 and 2008 crises (Bagus, 2017). The impact of the crisis can be seen in the increase in the NPF (*Non-Performing Financing*) ratio, especially in Islamic banks. The economic crisis also caused the number of banks in Indonesia to shrink dramatically from 240 to around 73 banks (Muhammad, 2005). One concrete example is Bank Muamalat, which was nearly bankrupt and was saved through *a bailout* by *the Islamic Development Bank*, with critical financial conditions in 2015 marked by an NPF of more than 60% and losses of Rp 105 billion (Alvidianita, 2019).

According to (2019), the possibility of *financial distress* in banking is caused by external and internal factors. According to Tri (2022), external factors originate from a country's macroeconomic conditions, such as inflation instability and the weakening of the rupiah against the dollar. In addition, government policies such as tax increases can add to a company's operational costs, while policies to increase lending rates cause interest expenses to rise and increase pressure on the company's finances.

Micro-scale internal factors include cash flow problems, high debt burdens, and operations that are detrimental to the company. According to Rohiman (2019), the financial condition of a bank can be predicted through macroeconomic evaluation and *net cash flow*, where positive cash flow indicates a healthy financial condition. Other indicators such as *the cost income ratio* are used to assess efficiency. According to Choirina et al., (2015) *financial distress* can also be analyzed through financial ratios such as *Non-Performing Financing*, *Financing to Deposit Ratio*, and *Capital Adequacy Ratio*.

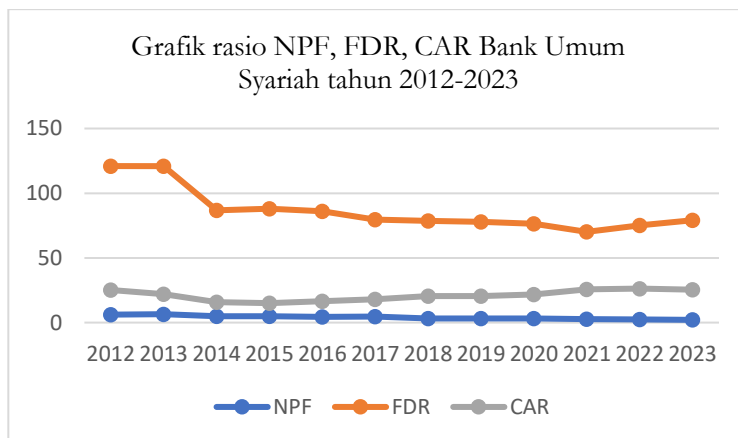


Figure1 . Graph of NPF, FDR, and CAR BUS ratios for 2012-2023
 Source: Data processed by Sharia Commercial Bank statistics

Based on Figure 1.1, the NPF ratio of Islamic commercial banks in the 2012–2015 period declined and improved again in 2016, indicating that the management of non-performing financing was increasingly under control (Annisa, 2022). In 2014, the FDR ratio fell to 86%, indicating that Islamic commercial banks were in relatively good health. Meanwhile, the CAR ratio appeared to be quite stable despite a decline in 2014, but it increased again from 2016 to 2023. The increase in CAR indicates the ability of Islamic banks to cover risky assets with increasingly strong capital (Pamungkas et al., 2021) .

In measuring bank health, the *RGEC* method is used as a development of the CAMEL approach regulated in PBI No.06/10/PBI/2004 (Djariyah et al., 2023) . According to the assessment of bank health is regulated through PBI No.13/1/PBI/2011, SE BI No.13/24/DPNP, and SE OJK No.14/SEOJK.03/2017. The *RGEC* method assesses risk profile, *good corporate governance*, income, and capital, making it effective in evaluating stability, management quality, and a bank's readiness to face future risks (Permana, 2012).

This study was motivated by the existence of differences in results (*research gap*) in various previous studies related to factors affecting *financial distress* in the banking sector. A number of studies such as Africa (2019); Buchdadi et al. (2020); Haq & Harto (2019); Hijriyani & Setiawan (2017); Ismawati (2023); Suotet et al. (2020); Yuliani & Haryati (2022) state that the NPF ratio has a positive effect on *financial distress*. However, different findings were presented by Harahap (2018); Kuncoro (2017); Widiyanto (2022), who stated that NPF has no effect.

Differences in results were also found in the FDR ratio, where Bagus (2017); Haq (2019); Mahmud (2021); Sari (2020); Sriyanto (2020) found a positive effect on *financial distress*, while Ermar (2021); Sari (2016); Sadida (2018); Widiyanto (2022) stated the opposite. A similar situation occurred in the GCG, ROA, and CAR variables, which showed inconsistent research results (Prabawati et al., 2021; Wijayanti et al., 2018; Mugiarti, 2020; Suhartanto et al., 2022; Nisak, 2021; Mahmud, 2021).

The study by Khiswaradewi et al. (2023) used the *RGEC* approach and found that NPF, GCG, and ROA had a significant impact on *financial distress*, but it still had limitations because it used the *Altman Z-score* model, which was less relevant to banking, and the research period was short. Therefore, this study aims to develop a *financial distress* prediction model for Islamic Commercial Banks in Indonesia using *RGEC* components with the latest *Z-score* proxy from Čihák and Hesse (2010), which is expected to produce more accurate predictions. By using the *Z-score* test model proxy on *financial distress* components, it is expected to produce more accurate and appropriate research results. Based on these phenomena, the researcher is interested in taking the title **"DETERMINANTS OF THE Z-SCORE MODEL IN PREDICTING FINANCIAL DISTRESS WITH RGEC COMPONENTS (EMPIRICAL STUDY OF ISLAMIC COMMERCIAL BANKS IN INDONESIA FOR THE PERIOD 2012-2023)"**.

LITERATURE REVIEW

Theoretical Framework

1. *Grand Theory*

This study uses *agency theory* to explain the relationship between *corporate governance* and *financial distress*. This theory explains the contractual relationship between owners (*principals*) and management (*agents*) who are authorized to manage the company (Kushariadi, 2018). In this context, the implementation of *good corporate governance* is necessary to avoid unhealthy relationships between principals and agents. Management is morally responsible for optimizing shareholder profits in accordance with the agreement (Jensen & Meckling, 1976). According to Soemarso (2018), this theory is relevant when there is a separation between shareholders and management, as stipulated in UUPT No.40 of 2007. The relationship between agency theory and *financial distress* is evident through the assessment of *Good Corporate Governance* (GCG). According to Tarjo(2022) , poor management of *financial distress* can be triggered by *agency problems* and *asymmetric information*, which make it difficult for owners to supervise management(Mayangsari, 2018) . Therefore, transparent disclosure of bank health is necessary to reduce conflicts and prevent bankruptcy (Restiana, 2023).

2. **Signaling Theory**

Signaling theory explains the existence of *asymmetric information* between management and stakeholders (Spence Michael, 1973). Financial reports are used as a means of conveying signals to investors and the public (Segarawasesa, 2021). According to Brigham and Houston (2011), signals help investors assess a company's prospects. The information in published financial reports forms the basis for assessing a company's health and potential *financial distress*, thereby influencing future investment decisions.

LITERATURE REVIEW

The literature review aims to examine research procedures and methods and distinguish the research conducted from previous studies. Cooper and Creswell (2010) state that literature research aims to inform relevant previous research results, fill research gaps, and link research to existing literature. Based on a review of previous studies, it is known that research on *financial distress* in the banking sector has been conducted extensively, but has shown varied results, both in terms of the variables used and the empirical findings produced.

Several studies such as Alvidianita & Rachmawati (2019), Khiswaradewi et al. (2023), Djariyah et al. (2023), Fitriana & Pratiwi (2022), and Hariono & Azizuddin (2022) show inconsistent results regarding the effect of NPF, FDR, GCG, ROA, and CAR on *financial distress*. Some studies found that NPF, ROA, or CAR had a significant effect, while other studies stated that these variables had no effect. Inconsistencies were also seen in the use of *financial distress* measurement models, most of which still used the *Altman Z-score*.

The differences in variables, methods, and research results indicate a *research gap* that needs to be re-examined. This study uses the variables NPF, FDR, GCG, ROA, and CAR with a focus on GCG obtained from the *self-assessment* scores of Islamic commercial banks (Indonesian Bankers Association, 2016). In addition, the limited number of studies using relevant test models and the inconsistency of

research results with theory are the basis for researchers to conduct further research to obtain more accurate results regarding the factors that influence *the financial distress* of Islamic commercial banks in Indonesia.

Hypothesis Development

Risk profiles are an important element in assessing bank health, particularly in predicting *financial distress*. The *Non-Performing Financing* (NPF) ratio is used to measure the level of non-performing financing relative to total financing. A high NPF reflects increased credit risk, declining profits, and instability in the bank's financial condition (Azizuddin, 2021). Bank Indonesia has set an NPF threshold of <5% as an indicator of bank health. Various previous studies have shown that the higher the NPF, the greater the likelihood of a bank experiencing *financial distress* (Reynaldy, 2023; Pamungkas et al., 2021; Sari, 2020; Ukhriyawati, 2021). Therefore, the following hypothesis is formulated:

H1: The Non-Performing Financing (NPF) variable has a negative effect on financial distress.

Liquidity risk is measured through *the Financing to Deposit Ratio* (FDR), which indicates a bank's ability to channel third-party funds into financing (Kasmir, 2014). An excessively high FDR increases liquidity risk and has the potential to trigger *financial distress* if the bank is unable to meet its short-term obligations. Financing disbursement that is not balanced with good risk management can reduce customer confidence (Humaira et al., 2021). Research by Fitriana et al. (2022), Nurhidayah (2018), and Rahmawati (2017) found that FDR has a positive effect on *financial distress*. Thus, the following hypothesis is formulated:

H2: The Financing to Deposit Ratio (FDR) variable has a negative effect on financial distress.

Good Corporate Governance (GCG) plays a role in improving the quality of bank management through the principles of transparency, accountability, and independence. GCG evaluation is an important tool in identifying potential financial problems and preventing *financial distress*. Banks with good governance will reduce *asymmetric information* and increase investor confidence (Kuncoro, 2017). Research by Anggita et al. (2022) and Kuncoro (2017) shows that GCG has a negative effect on *financial distress*. Thus, the following hypothesis is formulated:

H3: The Good Corporate Governance (GCG) variable has a negative effect on financial distress.

The *earning* aspect reflects a bank's ability to generate profits, which in this study is measured by *Return on Assets* (ROA). A high ROA indicates efficient use of assets and good profitability (Riyadi, 2014). Banks with high ROA tend to have lower *financial distress* risk. This is supported by research by Yuliani (2022), Sjahril et al. (2014), Almilia (2005), and Nurazi (2005), which states that ROA has a negative effect on *financial distress*, although Kowanda et al. (2015) found insignificant results. Based on this description, the following hypothesis is formulated:

H4: The Return on Assets (ROA) variable has a positive effect on financial distress.

Bank capital measured by *the Capital Adequacy Ratio* (CAR) is the main buffer against the risk of loss. Bank Indonesia has set a minimum CAR of 8% as the standard for capital adequacy. A high CAR indicates a bank's ability to bear the risk of productive assets and maintain financial stability (Sudirman, 2013). Research by Djariyah et al. (2023), Limbong et al. (2022), Putri et al. (2018), and Suot (2020) shows

that CAR has an effect on *financial distress*, although Alvidianita (2019) and Prianti (2018) found the opposite results. Based on previous studies, the following hypothesis is formulated:

H5: The Capital Adequacy Ratio (CAR) variable has a positive effect on financial distress.

Based on the theoretical framework and previous research results, the researcher formulated a conceptual framework for the study that describes the relationship between variables in this research model.

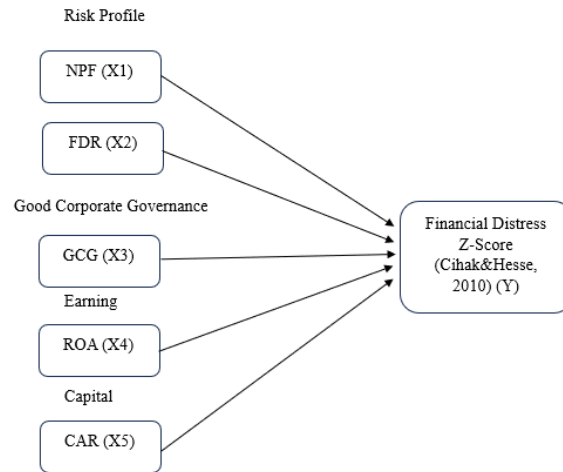


Figure 2. Research Framework
 Source: Processed by the Researcher (2025)

RESEARCH METHOD

This study uses a quantitative approach with secondary data in the form of annual financial reports of Islamic Commercial Banks published by the Financial Services Authority (OJK) during the period 2012–2023. The research population includes all Islamic Commercial Banks in Indonesia, with a saturated sampling technique based on the criteria of completeness and data publication, resulting in seven banks as research samples.

Table 1. Sampling Criteria

No	Sampling criteria	Meets criteria	Does not meet criteria
1.	Sharia Commercial Banks registered as Sharia Commercial Banks with the OJK during the period 2012-2023.	15	-
2.	Completeness of Sharia Commercial Bank financial reports from 2012 to 2023	7	8
3.	These financial statements have been published by the OJK	14	-
Amount obtained		7	

Source: Data processed by researchers, 2025

Table 2. List of Sharia Commercial Bank Samples

No	Bank Umum Syariah
1.	PT Bank Syariah Muamalat Indonesia
2.	PT Bank Syariah Mega Indonesia
3.	PT Bank Victoria Syariah
4.	PT BCA Syariah
5.	PT Bank Jabar dan Banten
6.	PT Bank Syariah Bukopin
7.	PT Bank Panin Syariah

Source: Data processed by researchers, 2025

Data analysis was performed using panel data regression to test the effect of NPF, FDR, GCG, ROA, and CAR on financial distress measured using the Z-Score method (Čihák & Hesse, 2010). The estimation models used included the Common Effect Model, Fixed Effect Model, and Random Effect Model (), with the best model selected through the Chow test, Hausman test, and Lagrange Multiplier test. In addition, classical assumption tests were conducted, including tests for normality, multicollinearity, heteroscedasticity, and autocorrelation. Hypothesis testing was conducted using t-tests, F-tests, and the coefficient of determination.

RESULTS AND DISCUSSION

Descriptive Analysis

Table 3. Descriptive Analysis

	Zscore	NPF	FDR	GCG	ROA	CAR
Mean	26.09939	0.039818	0.881743	2.071429	0.001617	0.238540
Median	10.21850	0.034800	0.904800	2.000000	0.005200	0.205200
Maximum	160.6140	0.220400	1.967300	3.000000	0.040800	1.496800
Minimum	0.671000	0.001000	0.383300	1.000000	-0.107700	0.111000
Std. Deviasi	42.07162	0.035842	0.180246	0.672806	0.023763	0.165015
Obs	84	84	84	84	84	84

Source: Processed secondary data, 2025

Based on the data in Table 3, observations of 84 data points show that the average (*mean*) NPF is 3.98% with a *median* value of 3.48%, indicating that the NPF condition is healthy as it is ranked at composite level 2. The maximum NPF value was recorded at BJB Syariah in 2017, while the minimum value was recorded at BCA Syariah in the 2012-2014 period, reflecting financing stability. The average FDR was 88.17% with a *median* of 90.48%, indicating poor conditions, although the lowest value at Bank Muamalat Indonesia in 2021 showed stable fund distribution. The GCG variable has a *mean* of 2.07, which indicates fairly good governance, while the average ROA of 0.16% shows unhealthy profitability, with a negative minimum value at Bank Panin Dubai Syariah in 2017. The average CAR of 23.85% confirms very healthy capital conditions. The average *z-score* of 26.10 indicates that *the financial distress of Islamic Commercial Banks for the period 2012–2023 is classified as very healthy.*

Selection of Regression Results

Based on the results of *the Common Effect Model* (CEM) regression, the variables NPF, FDR, GCG, and ROA have probability values above 0.05, indicating that they have no effect on *financial distress*. Meanwhile, the CAR variable shows a positive and significant effect on *financial distress* with a probability value of 0.0000, indicating that capital plays an important role in the financial condition of banks. Meanwhile, the results of *the Fixed Effect Model* (FEM) regression show a relatively similar pattern. The variables NPF, FDR, GCG, and ROA have no significant effect on *financial distress*, either positively or negatively. Conversely, CAR again shows a positive and significant effect with a probability value of 0.0000, thus confirming the consistency of CAR's role in explaining *financial distress* in Islamic Commercial Banks. In *the Random Effect Model* (REM), the variables NPF, FDR, and ROA remain insignificant in their effect on *financial distress*. Unlike the two previous models, GCG in REM has a significant negative effect, meaning that the better the corporate governance, the lower the risk of *financial distress*. Additionally, CAR continues to have a significant positive effect on *financial distress*.

Panel Data Regression Test

1. Chow Test

Table 4. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	199.842753	(6,72)	0.0000

Source: Processed secondary data, 2025

The Chow test results in Table 4 show that the F probability value is 0.0000. Therefore, in this study, the probability value is less than 0.05, or $0.0000 < 0.05$. Thus, the selected model is FEM.

2. Hausman Test

Table 5. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq.d.f	Prob.
<i>Cross-section random</i>	7.911421	5	0.1612

Source: Processed secondary data, 2025

The Chi-square probability value from the Hausman test in Table 5 indicates that the Hausman test result obtained a Chi-square probability value of 0.1612, which is smaller than 0.05 or $0.1612 < 0.05$, so the selected model is REM.

3. Lagrange Multiplier (LM) Test

Table 5. Lagrange Multiplier (LM) Test

Breusch-Pagan	0.0000
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Source: Processed secondary data, 2025

Based on the results of the Lagrange Multiplier Test, the Breusch-Pagan statistic value obtained is 0.0000, which is significant at the $\alpha = 0.05$ level. Thus, the *Random Effect* model is chosen as the more appropriate specification. Therefore, the hypothesis H0 is rejected and H1 is accepted.

Classical Assumption Test

1. Normality Test

Table 6. Normality Test

Jarque-Bera	Probability
11.39365	0.003357

Source: Processed secondary data, 2025

The normality test results in Table 6 show that the *Jarque-Bera* value is 1.448246. Based on these results, it can be concluded that the *Jarque-Bera* probability value is > 0.05 . Thus, it can be concluded that the data is not normally distributed.

2. Multicollinearity Test

Table 7. Multicollinearity Test

Variable	Centered VIF
X1 (NPF)	2.321575
X2 (FDR)	1.044900
X3 (GCG)	1.540567
X4 (ROA)	1.728133
X5 (CAR)	1.114063

Source: Processed secondary data, 2025

The results of the multicollinearity test in Table 7 show a VIF value < 10 . Thus, it can be concluded that there is no multicollinearity in the regression model of this study or that there is no significant linear relationship between the independent variables.

3. Heteroscedasticity Test

Table 8. Multicollinearity Test

Obs*R-Squared	0.0000
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Source: Processed secondary data, 2025

Based on Table 8, the Obs*R-Squared value > 0.05 indicates heteroscedasticity. However, the use of the *Random Effect Model* (REM) with *Generalized Least Square* (GLS) estimation is able to overcome the problems of heteroscedasticity and autocorrelation and produce estimators that meet the *Best Linear Unbiased Estimation* (BLUE) criteria.

4. Autocorrelation Test

Table 9. Autocorrelation Test

Durbin-Watson stat	1.899100
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Source: Processed secondary data, 2025

Based on Table 9, the *Durbin Watson* (DW) value is 0.768057. The value of du is 1.7462 and the value of dl is 1.5472, the value of $4 du$ is 2.2538, and the value of $4-dl$ is 2.4528. Therefore, the DW value is between du and $4 du$ ($1.7462 < 1.768057 < 2.2538$). Thus, there is no autocorrelation in this study.

Hypothesis Testing

1. General Regression Model Equation

$$Y = 85.4015376925 - 167.156186242*X_1 - 5.46820671923*X_2 - 29.2385107609*X_3 - 188.202018876*X_4 + 54.6865472895*X_5$$

Interpretation:

- The constant of 85.40 indicates that without the influence of FDR, NPF, GCG, ROA, and CAR, *financial distress* increases by 85.40%.
- NPF has a coefficient of -167.16 , which means that a 1% increase in NPF reduces *financial distress* by 167%, and vice versa.
- FDR has a coefficient of -5.46 , which indicates that a 1% increase in FDR reduces *financial distress* by 5.46%.
- GCG has a coefficient of -29.23 , which means that a 1% increase in GCG reduces *financial distress* by 29.23%.
- ROA has a coefficient of -188.20 , which indicates that a 1% increase in ROA reduces *financial distress* by 188%.
- CAR has a coefficient of -54.69 , which means that a 1% increase in CAR reduces *financial distress* by 54.69%.

2. t-test

Table 10. Panel Data Regression Test Results

Model	Variabel	Coefficient	t-statistic	Prob.
CEM	NPF (X1)	28.03830	0.668735	0.5056
	FDR (X2)	4.393048	0.748191	0.4566
	GCG (X3)	-1.995252	-0.951979	0.3440
	ROA (X4)	15.77798	0.287095	0.7748
	CAR (X5)	34.98673	5.426626	0.0000
FEM	NPF (X1)	30.24581	0.721039	0.4732
	FDR (X2)	4.434951	0.754834	0.4528
	GCG (X3)	-1.703960	-0.811553	0.4197
	ROA (X4)	18.00823	0.327522	0.7442
	CAR (X5)	34.80392	5.395628	0.0000
REM	NPF (X1)	-167.1562	-1.051175	0.2964
	FDR (X2)	-5.468207	-0.257761	0.7973
	GCG (X3)	-29.23851	-4.236922	0.0001
	ROA (X4)	-188.2020	-0.909455	0.3659
	CAR (X5)	54.68655	2.285577	0.0250

Source: Processed secondary data, 2025

Based on the t-test results presented in Table 10, it shows the effect of each independent variable on the dependent variable. A more detailed explanation of the test is as follows:

- a. The t-test results for the NPF variable (X1) obtained a t-value of 1.051175 < t-table 1.98 and a sig value of 0.2964 > 0.05, so H1 was rejected and H0 was accepted, meaning that the NPF variable had no effect on the financial distress of Islamic commercial banks in Indonesia.
- b. The t-test result for the FDR variable (X2) obtained a t-value of 0.257761 < t-table 1.98 and a sig value of 0.7973 > 0.05, so H1 is rejected and H0 is accepted, meaning that the FDR variable has no effect on *the financial distress* of Islamic Commercial Banks in Indonesia.
- c. The t-test result for the GCG variable (X3) obtained a t-value of 4.236922 > t-table 1.98 and a sig. value of 0.0001 < 0.05, so H1 is accepted and H0 is rejected, meaning that the GCG variable has a significant negative effect on *the financial distress* of Islamic Commercial Banks in Indonesia.
- d. The t-test results for the ROA variable (X4) obtained a t-value of 0.909455 < t-table 1.98 and a sig. value of 0.3659 > 0.05, so H0 was rejected and H1 was accepted, meaning that the ROA variable had no effect on *the financial distress* of Islamic commercial banks in Indonesia.
- e. The t-test result for the CAR variable (X5) obtained a t-value of 2.285577 > t-table 1.98 and a sig. value of 0.0250 < 0.05, so H1 is accepted and H0 is rejected, meaning that the CAR variable has a significant positive effect on *the financial distress* of Islamic Commercial Banks in Indonesia.

3. F Test

Table 11. Panel Data Regression Test Results

F-Statistic	Prob (F-Statistic)
9.698791	0.000000

Source: Processed secondary data, 2025

The calculated F value of 9.698791 > the table F value of 2.33 and the sig. value of 0.0000 < 0.05, therefore H0 is rejected and H1 is accepted, meaning that the variables FDR, NPF, GCG, ROA, and CAR simultaneously affect *financial distress*.

4. Determinant Coefficient

Table 12. Coefficient of Determination

Adj R-Squared	0.343842
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Source: Processed secondary data, 2025

The adjusted R Square value is 0.343842 or 34.38%. This indicates that the independent variables (NPF, FDR, GCG, ROA, and CAR) are able to explain the dependent variable (*financial distress*) in Islamic Commercial Banks in 2012-2023 by 34.38%, while the remaining 65.62% cannot be explained.

Discussion

1. The Effect of NPF (*Non-Performing Finance*) on *Financial Distress* in Islamic Commercial Banks in Indonesia from 2012-2023

The results show that the *Non-Performing Financing* (NPF) ratio has no effect on *the financial distress* of Islamic Commercial Banks in Indonesia during the period 2012–2023. This is evidenced by a regression coefficient of -167.1562 with a probability value of 0.2964 (> 0.05), thus rejecting hypothesis H1. This condition is influenced by the average NPF value of 3.98%, which is still below the 5% threshold as stipulated by Bank Indonesia, thus classified as healthy. The low level of non-

performing financing means that NPF is not strong enough to be an indicator for predicting *financial distress*. This finding is in line with the research of Muannasa et al. (2023); Elysa (2018); Sistiyanini (2017); Bakhtiar (2019); Zahronyana (2018); Rizqi (2022); and Wulandari (2020). In the context of *signaling theory*, a low NPF is a positive signal to the public that banks are able to manage credit risk effectively.

2. The Effect of FDR (*Financing to Deposit Ratio*) on *Financial Distress* of Islamic Commercial Banks in Indonesia from 2012-2023

The *Financing to Deposit Ratio* (FDR) was also found to have no effect on *financial distress*, with a coefficient of -0.257761 and a probability value of $0.7973 (> 0.05)$, thus rejecting hypothesis H2. During the research period, the average FDR value of 88% indicated healthy liquidity and the banks' ability to meet their short-term obligations. This indicates that high fund distribution does not always increase the risk of financial difficulties as long as liquidity is maintained. These results are consistent with the research of (2022); et al., (2023); Pamungkas et al., (2021); and Ukhriyawati, (2021). Based on *signaling theory*, a stable FDR provides a positive signal regarding the effectiveness of Islamic banks' intermediary function.

3. The Effect of GCG (*Good Corporate Governance*) on *Financial Distress* of Islamic Commercial Banks in Indonesia from 2012-2023

Unlike NPF and FDR, *Good Corporate Governance* (GCG) was proven to have a negative and significant effect on *financial distress*, with a coefficient of -4.236922 and a probability value of $0.0001 (< 0.05)$, thus accepting hypothesis H3. The average GCG composite score of 2 indicates healthy governance. The implementation of good GCG reflects the effectiveness of risk management and increases the *Z-score* value, thereby reducing the potential for bankruptcy. These results are in line with the research of, (2007); Triwahyuningtias, (2012); Wardhani, (2007); , and Wijayanti et al., (2018). From an *agency theory* perspective, GCG is able to reduce conflicts of interest and *asymmetric information* between management and owners, thereby minimizing the risk of *financial distress*.

4. The Effect of ROA on *Financial Distress* of Islamic Commercial Banks in Indonesia from 2012-2023

The *Return on Assets* (ROA) ratio does not have a significant effect on *financial distress*, with a coefficient of -188.2020 and a probability of $0.3659 (> 0.05)$, thus rejecting hypothesis H4. Although ROA reflects profitability, Islamic banks are still able to maintain financial stability through liquidity management and a profit-sharing system (*gross profit sharing*), which reduces the risk of *a bank run*. Furthermore, the decline in ROA does not significantly affect the *Z-score* value, which remained far from the bankruptcy threshold during the study period. These findings are in line with Muannasa et al., (2023); and Theodorus (2018). In *signaling theory*, good ROA remains a signal of asset management efficiency, even though it is not statistically significant.

5. The Effect of CAR on *Financial Distress* of Islamic Commercial Banks in Indonesia from 2012-2023

The *Capital Adequacy Ratio* (CAR) has a significant effect on *financial distress*, with a coefficient of 54.68655 and a probability value of $0.0250 (< 0.05)$, thus accepting hypothesis H5. During the period 2012–2023, the CAR of Islamic Commercial Banks was in the very healthy category ($\geq 12\%$), indicating strong capital adequacy in bearing risks. Adequate capital allows banks to withstand losses on productive assets and financial pressure. These findings are in line with the research of Suhadi,

2018; Djariyah et al., 2023; Patricia et al., 2024; and Widiyanto, 2022. Based on *signaling theory*, a high CAR is a positive signal to the public regarding the stability and financial resilience of Islamic banks.

CONCLUSION AND RECOMMENDATIONS

The phenomenon of *financial distress* describes a decline in a company's financial performance prior to bankruptcy, so that in the banking sector, periodic measurements need to be carried out as an early prevention measure. This study aims to evaluate the financial stability of Islamic Commercial Banks in Indonesia for the period 2012–2023 using a modified *Z-score* method, with *balanced panel* data regression analysis. The results show a relationship between the independent variables and *financial distress*, although the significance levels vary. Partially, NPF, FDR, and ROA do not have a significant effect on *financial distress*. Conversely, GCG has a negative and significant effect, while CAR has a positive and significant effect on *financial distress*. These findings confirm that corporate governance and capital adequacy play an important role in maintaining the financial stability of Islamic banks.

This study has several limitations, including limitations of previous studies that used the *Z-score* proxies of Čihák and Hesse, limited access to financial statement data, a sample size that only involved seven banks, and the use of secondary data. Therefore, future studies are recommended to add intervening or moderating variables and use more diverse GCG proxies. In practical terms, the results of the study show that Islamic Commercial Banks were not in a state of *financial distress* or bankruptcy during the study period. Nevertheless, bank management still needs to conduct regular financial health evaluations as an early warning system, particularly in capital management, in order to minimize the risk of *financial distress* in the future.

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