What are the determinants of non-performing financing in Islamic banks during Covid-19?

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Abstract

Several trading and banking sectors strive to survive the current pandemic. Despite the intense competition in the financial industry recently, Islamic banks have demonstrated remarkable growth. However, the issue of defaults in Islamic banks often arises, where debtors cannot repay the obtained financing, disrupting banking performance. This research investigates the factors influencing funding troubles in Islamic banks, especially during COVID-19. Specifically, this study examines whether factor-specific banks and macroeconomics in Islamic banks control troubled funding. The research utilizes quarterly data from Islamic banks in Southeast Asia (Malaysia and Indonesia) from 2020 to 2021. The findings indicate that liquidity risk, inefficiency, and economic growth do not significantly affect troubled financing in Islamic banks. At the same time, capital, profitability, and inflation significantly negatively impact funding troubles. These results recommend that Islamic banks increase their capital and profitability proportion to reduce the risk of funding trouble.

Keywords: Non-performing financing; Islamic bank; conventional bank; covid-19

1. Introduction

Corona Virus Disease 2019 (COVID-19) has become a new pandemic. The virus, which began spreading at the end of 2019 from the city of Wuhan, China, has had a significant impact, including on the financial sector. The adverse effects of the COVID-19 pandemic on global financial markets and economies started in March 2020. They may continue to be felt in various countries long after the pandemic has ended and social and economic activities have been restricted (Gourinchas, 2020).

Several trading and banking sectors strive to survive the current pandemic. Companies face significant struggles in coping with the pandemic's impact, and its effects vary across different sectors, financial markets, and economies (Ratnasingam *et al.*, 2020). Despite the intense competition in the financial industry recently, Islamic banks have demonstrated remarkable growth. The global expansion of Islamic banking has been propelled by its provision of an alternative system that meets the Muslim population's requirements while gaining global acceptance. Islamic banks operate and compete with conventional banks in more than 50 countries globally. However, the issue of defaults in Islamic banks often arises, where debtors cannot repay the obtained financing, disrupting banking performance (Disemadi and Shaleh, 2020). Loan repayments by debtors overdue for 90 days or more are classified as troubled financing.

According to Bank Indonesia Regulation No. 6/10/PBI/2004, a commercial bank with troubled financing exceeding 5% will be categorized as unhealthy. The calculation of the troubled financing ratio to total funding in Islamic banks is approximated by the Non-Performing Financing (NPF) ratio. This ratio reflects the bank's ability to return capital, provide new financing, and the bank's profitability. Moreover, a high level of troubled funding can reduce the efficiency of the financial system and affect

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the transmission of monetary policy. Therefore, during the pandemic, it is essential to identify the factors that influence the possibility of loan defaults or credit risks, particularly in Islamic banks.

This paper investigates the factors determining troubled financing in Islamic banks during the Covid-19 pandemic. Specifically, we focus on specific bank factors and macroeconomic factors. Previous literature has also focused on particular bank factors (Abid *et al.*, 2014; Berger and DeYoung, 1997; Louzis *et al.*, 2012). Most of them have found a significant influence of specific bank factors on troubled financing in Islamic banks. However, some researchers have also found a relationship between macroeconomics and non-performing financing. Naili and Lahrichi (2022), found that macroeconomic variables significantly influence non-performing financing.

This study also selects samples from Islamic banks in Southeast Asia, specifically from Indonesia and Malaysia. The choice of Indonesia and Malaysia as the research focus is grounded in several considerations. To begin with, both Indonesia and Malaysia rank among the top ten countries globally with the most prominent Islamic financial sectors. Additionally, the growth of Islamic banks in Indonesia and Malaysia, measured by total assets, continues to increase yearly. By the end of 2019, the total assets of Islamic banks in Indonesia reached IDR 499.98 trillion (Otoritas Jasa Keuangan (OJK), 2019). While in Malaysia, it reached IDR 2.789 trillion (Bank Negara Malaysia (BNM), 2019).

The remainder of this research is structured as follows: Section 2 elaborates on the literature review and hypothesis development. Section 3 presents data collection, variables, and methodology. Section 4 contains an explanation of the results. Lastly, Section 5 includes the conclusion and recommendations.

2. Literature review and hypothesis development

The distinctiveness of the banking system and the diverse policy decisions made by each bank are anticipated to result in differing effects and developments concerning non-performing financing. There is ample evidence examining specific bank factors that influence troubled financing.

Bank liquidity

While existing evidence explores the link between bank liquidity and non-performing financing, the literature does not provide conclusive findings regarding this association. On the one hand, researchers have documented that bank liquidity, as assessed by the Finance-to-Deposit Ratio (FDR), exerts a favorable influence on non-performing financing in Islamic banks. For instance, Diyanti and Widyarti (2012) and Fajriati (2016) found that increased FDR leads to higher troubled financing in Islamic banks. This stems from the fact that the Finance-to-Deposit Ratio (FDR) is a metric that gauges a bank's capacity to meet its obligations. When the FDR rises, it signifies reduced liquidity within the bank, consequently elevating non-performing financing in Islamic banks.

On the other hand, researchers have identified an inverse correlation between bank liquidity and non-performing financing. One study by Setiawan and Sherwin (2017) revealed that an increase in the Finance-to-Deposit Ratio (FDR) leads to a decrease in non-performing funding in Islamic banks. This contrasting result might be due to the possibility that the FDR can influence bank profitability as it allows the potential for earning profits or profit-sharing from the total financing disbursed. Therefore, these can be used to cover any funding troubles (Alissanda, 2015). Given the divergent findings concerning the connection between liquidity and non-performing financing, we delve deeper into this relationship with the following hypothesis:
H1 Bank liquidity influences Non-Performing Funds (NPF)

Bank capital

Numerous research investigations have demonstrated a significant influence of the Capital Adequacy Ratio (CAR) on non-performing financing, serving as a proxy for capital adequacy. Several research studies have indicated that capital adequacy detrimentally affects non-performing financing. Naili and Lahrichi (2022) found that capital adequacy reduces the risk of funding trouble faced by banks. Banks with higher capital adequacy levels are more inclined to lend prudently, aiming to preserve the capital set aside.

However, some literature found the opposite. Fajriati (2016) documented that capital adequacy positively impacts troubled financing. The higher the Capital Adequacy Ratio (CAR), the larger the capital and the greater the financial resources available for business development, including credit

disbursement activities. With more money available, the bank's lending activities will increase, leading to a higher risk of troubled credit. To either validate or challenge the prior empirical findings, we establish the following hypothesis:

H2 Bank capital adequacy influences troubled financing, proxied by Non-Performing Funds (NPF)

Bank performance

Several studies indicate that bank profitability, measured using Return on Assets (ROA), significantly influences troubled financing. Sabir *et al.* (2012) and Setiawan and Sherwin (2017) found that ROA hurts troubled financing. A bank that achieves a higher Return on Assets (ROA) generates greater profits, enhancing its ability to leverage its assets effectively. Furthermore, the profits earned can be used to address the emergence of troubled credits (NPL) (Anindya, 2013). To confirm or refute the previous empirical evidence, we formulate the following hypothesis:

H3 Bank profitability influences Non-Performing Funds (NPF)

Bank efficiency

Several studies further investigate the relationship between bank efficiency, measured by the Operating Income to Operating Expense (INEFF) ratio, and troubled financing. On the one hand, the literature finds a significant positive relationship between the INEFF ratio and troubled financing. One study by Alissanda (2015) found that the INEFF ratio increases the likelihood for troubled funding. This can happen because the higher the INEFF ratio, the lower the financing quality, thereby increasing the ratio of troubled financing due to a lack of total funding.

However, counterarguments from other literature support a negative relationship between the INEFF ratio and troubled financing. For example, Naili and Lahrichi (2022) discovered that the INEFF ratio reduces non-performing financing. Their rationale is that this ratio connects the expenses associated with credit assessment and evaluation processes to the quality of the bank's loan portfolio. Banks that do not allocate sufficient resources for thorough loan analysis and assurance may save costs in the short term, but they will likely encounter higher loan loss rates in the long run. Conversely, banks that appropriately allocate the necessary resources for loan evaluation have a better chance of minimizing their Non-Performing Loans (NPL) (Rossi *et al.*, 2009). Considering the contrasting evidence regarding the relationship between efficiency and troubled financing, we further investigate this relationship through the following hypothesis:

H4 Bank efficiency influences Non-Performing Funds (NPF)

Inflation

The earlier literature provides evidence of a relationship between inflation and non-performing financing. Some of them find that inflation increases non-performing financing. This is because high inflation rates erode the real income of borrowers and limit their ability to repay their loans (Rinaldi and Sanchis-Arellano, 2021). Additionally, in the case of variable interest rate loans, they often experience defaults when faced with high inflation conditions (Amuakwa-Mensah *et al.*, 2017).

However, some researchers have found a negative relationship between inflation and non-performing financing. High inflation rates tend to reduce the value of debt, enhancing the loan repayment capacity (Nkusu, 2011). Furthermore, worker wage increases, which tend to adjust to rising prices, ensure borrowers' ability to repay their loans (Khemraj and Pasha, 2009). With this background, we formulate the following hypothesis:

H5 Inflation influences Non-Performing Funds (NPF)

GDP Growth

Some empirical evidence indicates a relationship between macroeconomic factors and the quality of provided financing. Some researchers have found that during periods of economic expansion, individuals and businesses experience a consistent income stream that enables them to meet their financial obligations (Louzis *et al.*, 2012). Conversely, when the economy weakens, most households and companies struggle to fulfill their obligations, leading to loan defaults. This is due to the decreased value of assets used as collateral, increasing non-performing financing. Some researchers support that the non-performing financing rate drops during economic downturns (Jabbouri and Naili, 2019; Nkusu,

2011). Based on these findings, we anticipate an inverse relationship between economic growth and non-performing financing. Therefore, we hypothesize:

H6 GDP Growth influences Non-Performing Funds (NPF)

3. Method

Data and sample

The primary objective of this study is to explore the correlation between distinct banking variables and non-performing financing in Islamic banks within the context of the Covid-19 pandemic in Indonesia and Malaysia. Data for this research were collected from quarterly financial reports of each bank, sourced from their respective websites. The study employs panel data covering seven quarters from 2020q1 to 2021q3. Consequently, a sample of 15 Islamic banks in Indonesia and Malaysia was obtained, with 105 observations.

Table 1. List of Islamic banks in Indonesia and Malaysia

No	Bank	2020	2021
Indonesia			
1	Bank Syariah Indonesia (BSI)	4	3
2	Muamalat Indonesia	4	3
3	BCA Syariah	4	3
4	Maybank Syariah	4	3
5	Bukopin Syariah	4	3
6	Victoria Syariah	4	3
7	Panin Syariah	4	3
Malaysia			
1	Affin Islamic Bank	4	3
2	Bank Islam Malaysia	4	3
3	CIMB Islamic	4	3
4	HSBC Amanah Malaysia Bank	4	3
5	MBSB	4	3
6	Muamalat Malaysia	4	3
7	RBH Islamic	4	3
8	Standard Chartered Saadiq Bank	4	3
	Total	60	45

Variable

The variables used in this research are divided into two categories. Bank-specific variables and macroeconomic variables.

    a. Dependent variable

In this study, the dependent variable is defined as Non-Performing Financing (NPF), which represents the value of problematic loans that may be difficult to recover. A loan is considered troubled if unpaid for more than 90 days. The larger the NPF value, the lower the bank's perceived level of financial management professionalism. Bank Indonesia sets the maximum Non-Performing Financing ratio at 5%. Moreover, the presence of troubled financing reflected in NPF will impact revenue losses, as the bank needs to gain the opportunity to generate income from the funding provided.

$$NPF = \frac{\text{Total financing}}{\text{Financing problem}} \text{ x } 100\% \dots (1)$$

    b. Independent variable
        ➤ Bank specific variable
            - Bank liquidity (FDR)

Islamic banking does not use the term "loan" but instead uses "financing" to refer to their lending activities. The Financing Deposit Ratio (FDR) measures the liquidity of

Islamic banks, indicating the proportion of third-party funds used by the bank for financing purposes. The liquidity of each bank differs based on the bank's specific business, size, and other factors. Therefore, it is essential to consider aspects of its obligations to assess whether a bank has sufficient liquidity using the FDR.

$$\text{Financing to deposit ratio} = \frac{\text{Total financing will be offered}}{\text{Third party funds}} \text{ x } 100\% \dots (2)$$

- Capital adequacy ratio (CAR)
  According to government regulations, this ratio compares a bank's capital to its risk-weighted assets. The higher the Capital Adequacy Ratio, the better the bank's capital adequacy to withstand all financial risks. The bank's capital consists of core capital (paid-up capital, share premium, general reserves, and retained earnings) plus supplementary capital (revaluation reserves of fixed assets). The assessment of CAR is intended to determine the capital adequacy to cover potential loss risks arising from investments in productive assets containing risks, such as credit.

$$\text{Capital adequacy ratio} = \frac{\text{Bank capital}}{\text{Risk weighted average}} \text{ x } 100\% \dots (3)$$

- Bank performance (ROA)
  Return on Assets (ROA) is the ratio used to measure the bank's profitability. The higher the ROA, the better a company can efficiently utilize its assets to generate profits. ROA is computed as a ratio of earnings before tax divided by total assets.

$$\text{Return on assets} = \frac{\text{Earnings before taxes}}{\text{Total assets}} \text{ x } 100\% \dots (4)$$

- Bank inefficiency
  The Operating Income Operating Expense (INEFF) is a metric that quantifies the efficiency of a bank's operational costs by measuring the ratio of total operating expenses to total operating income, computed on a per-item basis. Total operating expenses are determined by aggregating interest and other operating costs, while total active income comprises the sum of interest and other operating income. A higher INEFF ratio indicates the bank's operational costs are less efficient.

$$\text{INEF} = \frac{\text{Operating income}}{\text{Operating expense}} \text{ x } 100\% \dots (5)$$

➢ Macroeconomic variable
  - Inflation
    Inflation is a condition characterized by a tendency for the prices of goods and services to rise. Inflation represents the decrease in the value of money in the economy due to the increase in prices of goods and services exceeding the available quantity of goods or services. The inflation rate is the ratio comparing the current-year Consumer Price Index (CPI) and the previous-year CPI to the previous-year CPI itself. In this case, inflation is proxied by the inflation rate at the end of the quarter, with data sourced from Bank Indonesia and Bank Negara Malaysia.
  - GDP Growth
    Gross Domestic Product (GDP) is the total monetary value of all goods and services produced in an economy over one year. GDP growth is the value of GDP in a specific year compared to the previous period. In this case, GDP is proxied by the Gross Domestic Product Growth Rate at Constant 2000 Prices by Industry, with data from the Central Statistics Agency and Bank Negara Malaysia.

Data analysis method

This research utilizes panel data regression as its analytical tool. Selecting the appropriate model is essential in describing the results of panel data regression. The chosen model's results are tested based on classical assumptions to strengthen the model. The final step involves hypothesis testing, which includes testing the research variables. There are several methods commonly used to estimate regression models with panel data, namely pooling least squares (Common Effect), fixed-effects approach (Fixed Effect), and random-effects approach (Random Effect). According to Usman and Nachrowi (2006), there are several ways to determine whether Fixed Effects Model (FEM) or Random Effects Model (REM) is the appropriate model, namely:

a. If T (time-series data) > N (cross-sectional data), then it is recommended to use FEM
b. If N (cross-sectional data) > T (time-series data), then it is recommended to use REM
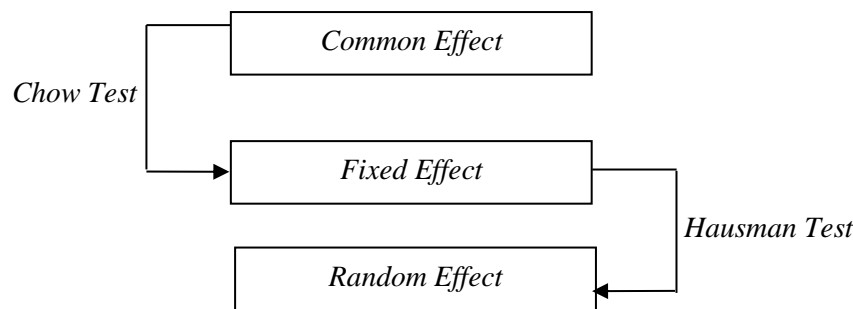
Sources: Gujarati (2004)

Figure 1. Choosing regression model panel data

4. Results and discussion

Descriptive statistic

Table 2. provides descriptive statistics for all Islamic banks in Indonesia and Malaysia from 2020q1 to 2021q3. The average NPF ratio is 2.9, which is still categorized as healthy because it is below 5 percent. The banks have relatively high liquidity risk, capital adequacy, and inefficiency, which are 91.7 percent, 21.5 percent, and 79.9 percent, respectively. However, profitability, proxied by ROA, has a relatively low average of 0.4 percent. Regarding macroeconomic indicators, the descriptive statistics show that the average inflation rate is 0.6 percent. Meanwhile, the average GDP growth rate during the pandemic period has declined by -0.39 percent. During the pandemic, GDP growth in Malaysia plummeted by -16.10 in the second quarter of 2020.

Table 2. Descriptive statistic

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
NPF	105	2.9395	1.9604	0.01	9.5303
FDR	105	91.7037	16.9064	55.73	149
CAR	105	21.5295	6.9259	12.12	45.26
ROA	105	0.4245	0.4951	-0.08	2.08
INEFF	105	79.9786	29.0021	16.26	128
INF	105	0.6543	0.3998	-0.2	1.3
GDPG	105	-0.3936	6.8688	-16.1	17.3

In addition to conducting descriptive tests on all variables, we conducted a correlation analysis for all the variables used before initiating the empirical procedures. The results are presented in the Correlation Matrix in Table 3. As evident, the correlation between the independent variable FDR and NPF is positive. Meanwhile, other variables, both specific to the bank and related to macroeconomics, exhibit a negative correlation with NPF.

Table 3. Correlation matrix

Variable	NPF	FDR	CAR	ROA	INEFF	INF	GDPG
NPF	1.000						
FDR	0.0039	1.000					
CAR	-0.2595	0.0966	1.000				
ROA	-0.2201	-0.1699	0.3958	1.000			
INEFF	-0.0343	-0.1974	-0.0024	-0.0063	1.000		
INF	-0.1332	0.0443	-0.2696	-0.2612	-0.3494	1.000	
GDPG	-0.0183	0.0234	0.0481	0.0199	0.0286	-0.1192	1.000

The impact of bank-specific determinants on banks' non-performing financing

The regression coefficient of the variable FDR has a positive value of 0.00021 in model 1 and a negative value of -0.00304 in model 2. The significance values of models 1 and 2 are higher than the significant level of 1%, 5%, or 10%. These results indicate the absence of a substantial influence between Islamic banks' financing-to-deposit ratio and NPF. Therefore, hypothesis 1 is rejected. Our results differ from those reported in studies by Diyanti and Widyarti (2012) and Fajriati (2016), which identified a substantial relationship between FDR and NPF under normal circumstances. This inconsistency may be attributed to the economic challenges brought about by the COVID-19 pandemic, during which the government enacted measures to ease liquidity pressures and manage potential credit risks (Bank Indonesia, 2020). Consequently, variations in liquidity levels may not significantly influence non-performing loans across all banks, particularly within Islamic banks during the pandemic period.

Table 4. The estimation results of the random effect

NPF	1	2
FDR	0.000214 (0.02)	-0.00304 (-0.26)
CAR	**-0.0640** (-2.06)	**-0.0802***(-2.63)
ROA	-0.607 (-1.39)	**-0.946**(-2.17)
INEFF	-0.00248 (-0.36)	-0.0114 (-1.58)
INF		**-1.971***(-3.04)
GDPG		0.0203 (0.53)
Constant	2.9388	3.0343
Obs.	105	105
Number of banks	15	15
Time effect	Yes	Yes
Adj. R2	0.0901	0.0971
Wald X2 Stat	9.10	9.99

Note: ***, **, and * indicate level of significance in 1%, 5%, and 10% respectively

The regression results for the coefficient of the CAR variable show a negative value of -0.0640 in model 1 and 0.0802 in model 2. The significance value is 5% in model 1 and 1% in model 2. These results indicate a significant negative influence between Islamic banks' capital adequacy ratio and NPF. Therefore, hypothesis 2 is accepted. Our findings confirm those of Naili and Lahrichi (2022), who found a negative influence of capital adequacy on troubled financing. Banks with high capital adequacy levels are more inclined to provide loans prudently, intending to preserve the capital set aside.

The regression results for the coefficient of the ROA variable show a negative value of -0.607 in model 1 and -0.946 in model 2. The significant value in model 1 is higher than substantial. Although in model 1, the significance value is larger than the specified level, in model 2, the significance value is below 5%. Our analysis supports the notion of poor management, as proposed by the lousy management hypothesis. This hypothesis suggests that low profitability indicates a deficiency in managerial skills related to lending strategies, leading to a higher financing problem (Louzis *et al.*, 2012). Banks with low profitability are more inclined to increase their risk exposure and adopt a lenient credit policy to recover previous losses and maintain their current profitability, often at the expense of higher future NPF. On the other hand, highly profitable banks, as they face less pressure to generate

additional income than their counterparts, tend to be more cautious in granting risky loans, thereby reducing their financing risk (Jabbouri and Naili, 2019; Louzis *et al.*, 2012).

The regression results for the coefficient of the INEFF variable show a negative value of -0.00248 in model 1 and -0.0114 in model 2. The significance value is higher than the significant level in models 1 and 2. These results indicate a non-significant influence between Islamic banks' operational expense ratio to operating income ratio and NPF. Therefore, hypothesis 3 is rejected. The bank's operational activities related to fund gathering or disbursement can be assessed through the bank's INEFF ratio. However, the results of this study indicate that fluctuations in the bank's INEFF ratio over the study period did not correlate with changes in the volume of troubled loans. These findings are consistent with several prior studies that have also suggested that INEFF does not significantly influence NPF. For instance, conducted by Wulandari *et al.* (2021) and Angel Deijeni Mamahit (2022) has shown that a high INEFF arising from funds gathered from the public does not impact the bank's NPF.

The impact of macroeconomics determinants on banks' non-performing financing

In model 2, we specifically included macroeconomic variables to investigate their influence on non-performing financing in banks during the pandemic. Our analysis revealed a significant negative relationship between inflation and bank NPF during the pandemic, significant at the 1% level. Therefore, hypothesis 5 is accepted. This finding aligns with Khemraj and Pasha (2009) and Nkusu (2011), which found that higher inflation rates are associated with decreased non-performing financing. This is because high inflation can facilitate borrowers' ability to repay their loans by reducing the absolute value of the loan. High inflation also contributes to lower unemployment rates, allowing borrowers to generate income to meet their debt obligations.

We found a regression result for GDP growth with a coefficient of 0.0203, and the significance value is above the predefined level. Therefore, during the Covid-19 pandemic, we did not find a significant relationship between GDP growth and banking NPF. This study contradicts the findings of some researchers Jabbouri and Naili (2019); Louzis *et al.* (2012); Nkusu, (2011), who discovered a relationship between GDP growth and banking NPF. We argue that the public's fear of meeting consumption needs during large-scale social restrictions (*Pembatasan Sosial Berskala Besar-PSBB*) during the pandemic forced them to spend money. Consequently, the increase or decrease in people's income did not affect the debtors' ability to repay their loans; instead, the surplus revenue was used for consumption.

5. Conclusion

This study analyzes the factors influencing non-performing financing (NPF) in Islamic banks during the Covid-19 pandemic in Indonesia and Malaysia. We used panel data from 2020q1 to 2021q3 with a random effect model. Our findings support a relationship between specific bank factors such as Capital Adequacy Ratio (CAR), Profitability (ROA), and NPF in Islamic banks. CAR and ROA have a significant negative relationship with NPF, meaning that an increase in CAR and ROA ratios will reduce the risk of troubled financing in Islamic banks. We also found a significant association between a macroeconomic variable, inflation, and NPF in Islamic banks. Inflation negatively and significantly impacts NPF, where higher inflation rates reduce NPF in Islamic banks during the pandemic. However, we did not find any significant impact of factors like the Funding Dependency Ratio (FDR), Bank Inefficiency (INEFF), and Economic Growth (GDPG) on NPF in Islamic banks in Indonesia and Malaysia during this period.

Based on our findings, we recommend that the banking sector consider implementing policies to reduce NPF in Islamic banks by managing specific bank factors. Additionally, banks should adopt careful credit policies, implement strict credit risk management, and invest in developing competencies or technical training for credit managers to minimize NPF. Furthermore, banks should identify other factors that can influence NPF to understand what leads to non-performing or troubled financing. Consequently, further research or additional studies related to this research or exploring factors that can affect NPF in other contexts should be conducted to compare and validate the results of this study.

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