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Financing to Deposit Ratio Impact on Non-Performing Financing in Islamic Housing Finance

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ABSTRACT

Introduction: Property sector is recognized as a key driver of national economic growth and has proven its resilience during COVID-19 pandemic. Home financing not only serves as a key driver of economic growth in the real sector but also reflects the dynamics of the banking industry. Non-performing financing (NPF) in this sector is a crucial indicator of the quality of the banking portfolio and the overall stability of the financial system.

Objectives: This study aimed to evaluate the factors influencing Non-Performing Financing (NPF) of Islamic housing finance ownership in Indonesia during pandemic, with a particular focus on the role of the Financing to Deposit Ratio (FDR).

Methods: Due to the presence of cointegration, data analysis was conducted using Vector Error Correction Model (VECM).

Results: The findings revealed that during the pandemic, the FDR of Islamic banks significantly impacted the apartments sector but had no effect on residentials and shophouses in the long-run. In the short-run, FDR had no impact on all sector of NPF housing finance (residentials, apartments, and shophouses).

Implications: The opportunity for access to housing finance increased as the management of NPF improved. A sustained synergy between banks and relevant stakeholders were essential to ensure the continuous growth and development of housing financing in Indonesia, especially during the pandemic, as the property sector serves as a key driver of the real economy.

Keywords: Financing to deposit ratio, non-performing financing, Islamic bank, housing finance ownership.

INTRODUCTION

Indonesia's economy contracted by 5.32% (YoY) in Q2 2020 following the announcement of the first COVID-19 case (Badan Pusat Statistik, 2020). The pandemic not only affected the economic sector but also had a significant impact on other industries such as transportation, tourism, and trade. The banking sector was no exception, experiencing substantial disruptions due to the crisis.

The majority of Indonesia's population is Muslim, accounting for approximately 86.7% of the total population (Studie, 2021). This demographic condition underscores the vital role of Islamic banking as a financial intermediary in Indonesia. However, compared to conventional banks, data from the Islamic Banking Statistics and Indonesian Banking Statistics indicate that as of 2023, the assets of Islamic bank, excluding Islamic Rural Banks, accounted for only 7.39% of the total banking assets (Otoritas Jasa Keuangan, 2023c).

Housing is one of the fundamental human needs. In Indonesia, the homeownership backlog reached 12.7 million in 2021 (Housing & Real Estate Information System, 2021). Islamic banking provides a financing facility known as

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housing finance ownership to support the government's efforts in addressing this backlog. According to data from the Islamic Banking Statistics and Indonesian Banking Statistics as of June 2023, housing finance ownership for residential houses, apartments, and shophouses holds the largest share among all consumer financing categories in Islamic banking, accounting for 48.92%. However, the utilization of housing finance ownership in Islamic banking, excluding Islamic Rural Banks, remains relatively low at only 16.65% compared to 83.35% in conventional commercial banks.

One of the crucial indicators in assessing asset quality and financial institution stability is the level of non-performing financing or loans (NPF/NPL). At the onset of the pandemic, data from Central Statistics Agency (CSA) indicated that the real estate sector remained one of the few sectors to record growth, with a year-on-year (YoY) increase of 1.25% in Q4 2020. A study by Hardiyanti & Aziz (2021) found that COVID-19 had an impact on non-performing loans in conventional commercial banks in Indonesia. Statistically, asset quality is a significant factor in predicting the likelihood of bankruptcy (Berger & DeYoung, 1997). Several studies have identified that the increase in NPL can be attributed to both bank-specific factors and macroeconomic conditions (Dimitrios *et al.*, 2016). Table 1 presents the trends in NPF for the housing sector (residentials, apartments, and shophouses) from 2018 to June 2023 (Otoritas Jasa Keuangan, 2023c). Based on NPF by housing sector on Table 1, shophouses exhibit the highest risk compared to residentials and apartments.

Table 1. Trends in Financing and NPF Housing Sector, 2018 – June 2023

Descriptions	2018	2019	2020	2021	2022	June 2023
Residentials financing	71,887	81,215	90,453	100,275	116,854	123,359
NPF of Residentials	1.97%	2.11%	2.23%	1.87%	2.07%	2.28%
Apartments financing	2,670	3,078	3,385	3,934	4,445	4,829
NPF of Apartments	1.65%	1.27%	2.68%	1.41%	1.98%	2.03%
Shophouses financing	3,272	3,515	3,831	3,866	3,761	3,830
NPF of Shophouses	3.91%	5.21%	5.36%	5.24%	4.92%	5.07%

Source: Islamic Banking Statistics, 2018-June 2023 (processed data)
Description: Housing sector financing in IDR billion

In terms of bank-specific or internal factors, Financing to Deposit Ratio (FDR) is linked to various aspects of a bank's financial statements, including both the income statement and balance sheet. Financing to Deposit Ratio (FDR) is associated with financing disbursed on the asset side of the balance sheet. If FDR is too high and not properly managed, the risk of NPF increases, which can ultimately reduce profitability.

During the pandemic, the FDR ratio declined in 2021 but gradually increased in 2022, returning to the FDR threshold, indicating that the intermediary function was back on track (Otoritas Jasa Keuangan, 2023b). Figure 1 illustrates the trends in FDR of Islamic banking, covering Islamic Commercial Banks (ICB), Islamic Business Units (IBU), and Islamic Rural Banks (IRB), from 2018 to June 2023 (Otoritas Jasa Keuangan, 2023c).

Figure 1. Trends in Islamic Banking FDR, 2018 – June 2023
Source: Islamic Banking Statistics, 2018 – June 2023 (processed data)

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Based on the explanation above, this study aims to examine the impact of FDR on NPF in the housing sector (residentials, apartments, and shophouses) within Islamic banking during the COVID-19 pandemic period.

LITERATUR REVIEW AND OBJECTIVES

According to the 2023 Indonesian Banking Booklet, the Financing to Deposit Ratio (FDR) or Loan to Deposit Ratio (LDR) refers to the ratio of financing/loans provided to third parties in both Rupiah and foreign currencies (excluding interbank financing/loans) to third-party funds, which include demand deposits, savings, and time deposits in Rupiah and foreign currencies (excluding interbank funds) (Otoritas Jasa Keuangan, 2023a). Based on corporate finance theory, a higher credit-to-deposit ratio increases the risk of non-performing loans in the banking sector (Rahman *et al*., 2017). A bank is considered to have sufficient liquidity if it can promptly return depositor funds and meet external financing needs (Ichsan *et al*., 2021). Conversely, a low FDR/LDR suggests inefficiency in allocating financing (Devi, 2021).

As stipulated in Financial Services Authority (FSA) Regulation No. 2/POJK.03/2022, financing quality is assessed based on three key factors: business prospects, customer performance, and repayment ability. Financing is classified into five categories: current, special mention, substandard, doubtful, and bad. Financing is considered NPF or NPL if classified as substandard, doubtful, and bad. Non-performing financing arises when customers fail to make timely payments or do not meet contractual obligations. Higher allocation of funds for financing increases the risk of NPF if not accompanied by robust risk management (Ibrahim & Rahmati, 2017). Banks that fail to implement effective risk management when extending financing or loans may experience higher NPL ratios. This can negatively impact their financial health, as a high level of NPL indicates increased risk (Ekananda, 2017). Conversely, Nugraha & Setiawan (2018) suggest that larger banks with strong growth prospects are better positioned to mitigate the risk of NPF.

Previous studies on the relationship between FDR or LDR and NPF or NPL in banking have yielded mixed results. Akhter (2023) found a significant negative relationship in Bangladesh's commercial banking sector, while. Misman *et al*. (2015) also observed that financing expansion had a negative correlation with NPF in Malaysia's Islamic banking industry. Conversely, studies by Rahman *et al*. (2017), Suryanto (2015), Firmansyah (2014) indicate that a high FDR/LDR, if not managed properly, can lead to an increase in NPF/NPL. Research on Islamic Rural Banks (IRB) by Priyadi *et al*. (2021) and Muhammad *et al*. (2020) found that FDR had no significant effect on NPF. This could be due to IRB being selective in choosing financing with high profit potential and focusing more on low-risk financing, such as Murabaha-based contracts. Specific studies on NPF in housing financing have been conducted by Anto *et al*. (2022), Fakhrunnas *et al*. (2021), dan Louzis *et al*. (2012). Louzis *et al*. (2012) found that mortgage loans in Greece were less sensitive to NPLs since they were primarily granted to government employees and highly skilled individuals.

Based on these considerations, this study formulates and tests an alternative hypothesis regarding the impact of FDR on NPF in housing finance ownership as follows:

H_1 : Financing to Deposit Ratio (FDR) has an impact on NPF in residentials during the COVID-19 pandemic period
H_2 : Financing to Deposit Ratio (FDR) has an impact on NPF in apartments during the COVID-19 pandemic period
H_3 : Financing to Deposit Ratio (FDR) has an impact on NPF in shophouses during the COVID-19 pandemic period

METHODS

Our study utilizes monthly panel data from 33 provinces across Indonesia during the pandemic period (March 2020 – June 2023). Data is obtained from secondary sources, including the Islamic Banking Statistics of FSA, and CSA for macroeconomic variables. Variables examined in this study include NPF in housing sector (residentials, apartments, and shophouses), third-party funds, financing-to-deposit ratio, assets, inflation rate, and regional gross domestic product growth rate. Data analysis employs the Vector Error Correction Model (VECM).

Panel data is a technique for collecting sample observations across cross-sections over a specific period (Misman *et al*., 2015). Panel data model is presented using the following equation as follows:

$$y_{it} = \beta_0 + \beta_{it}X_{it} + u_{it} \quad \text{.....(1)}$$

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In panel data, observations are indexed through the N x T. N represents the number of cross-sectional observations (i=1, 2, ..., N) dan T denotes the time series dimension (annual, monthly, or daily) (t=1, 2, ..., T). y_{it}, u_{it} are N x 1 vector; X is N x k matrix ; β is k x 1 vector; β_0 is an unknown constant coefficient to be estimated; dan X_{it} represents the explanatory variables of dimension k.

Several preliminary tests are conducted on the variables before further analysis using VECM:

a. Panel Unit Root Test
Unit root panel test is used to determine the level of stationarity of each variable. Unit root test must be carried out to see if the variable data has a unit root that can cause false/pseudo regression or spurious regression (Shao *et al*., 2021).

$$y_{it} = \rho_i\, y_{it-1} + \delta_i X_{it} + \varepsilon_{it} \quad \text{..... (2)}$$

where i = 1, 2, 3 ... describes province; t = 1, 2, 3, ... is period of study; X_{it} is an exogenous variable; ρ_i is autoregression coefficient; ε_{it} is stationery process. If ρ_i<1, there is a weak stationery trend; and if ρ_i>1, there is a unit root in the data (Suryanto *et al*., 2023).

b. Panel Cointegration
Cointegration test is conducted to determine whether a long-term relationship exists among the variables under study. Determining the long-term relationship between variables reveals the adjustment period of the causal relationship between the variables (Engle & Granger, 1987). Stationarity needs to be achieved at the first difference if the variables exhibit unit roots at levels (non-stationary). After differencing, these variables no longer have unit roots and become stationary, or these variables are cointegrated at the first difference (I(1)) (He *et al*., 2021).

c. Vector Error Correction Model
In general, panel VECM model in this study formulated as follows:

$$\Delta NP_{it} = \alpha + \sum_{n=1}^{k-1} \beta_{1n}\, \Delta NP_{i,t-n} + \sum_{n=1}^{k-1} \beta_{2n}\, \Delta FDR_{i,t-n} + \sum_{n=1}^{k-1} \beta_{3n}\, \Delta Ln\_TPF_{i,t-n} + \sum_{n=1}^{k-1} \beta_{4n}\, \Delta Ln\_ASSET_{i,t-n} + \sum_{n=1}^{k-1} \beta_{5n} \Delta INF_{i,t-n} + \sum_{n=1}^{k-1} \varphi_{6n}\, \Delta GRDP_{i,t-n} + \lambda\, ECT_{i,t-1} + \varepsilon_{it} \quad \text{..... (3)}$$

where NP = NPF housing sector (residentials-NPRS, apartments-NPAP, shophouses-NPSH); TPF = third-party funds; FDR = *financing-to-deposit* ratio; ASET = asset total, INF = inflation rate; RGDP = regional gross domestic product growth rate; Δ = *difference operator;* λ = adjustment speed parameter; $ECT_{i,t-1}$= refers to the panel error correction term, which is the lagged residual value obtained from the cointegration regression; ε_{it} = *stochastic error terms*.

Third-party funds and assets are transformed using the natural logarithm to reduce correlation among variables and mitigate heteroskedasticity (Kuwornu & Victor, 2011).

d. Impulse Response Function and Variance Decomposition
Results of VECM provide insights into the Impulse Response Function (IRF) and Variance Decomposition (VD). Response of IRF illustrates variable shocks from other variables within the system, assuming all other shocks are zero (Love & Zicchino, 2006). Additionally, it traces the impact of these shocks over multiple periods. Meanwhile, VD explains the relative contribution of independent variables in influencing the dependent variable throughout the observation period (Yusof & Bahlous, 2013).

RESULTS

The results of the panel unit root test in this study indicate that all variables are stationary at the first difference level (Tabel 2), consequently, this study is free from spurious regression issues.

Table 2. Panel Unit Root Test – *First Difference*

NPRS	NPAP	NPSH	FDR	LNTPF	LNASSET	INF	GRDP
572.94*	511.39*	420.00*	482.97*	582.50*	530.76*	304.58*	259.89*

Source: secondary data (processed) using ADF – Fisher Chi-square

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Description: *significance at 0.05 level

Optimal lag is determined to be at lag 8 based on the Akaike Information Criterion (AIC). Additionally, the Johansen cointegration test confirms the existence of cointegration among the six variables in each NPF housing finance sector model equation. Given this cointegration relationship, the analysis proceeds using the Vector Error Correction Model (VECM). The estimated panel VECM results for the relationship between assets and NPF in the housing sector are presented in Table 3.

Table 3. VECM Estimation

Variable	Short-run			Long-run		
	NPRS	NPAP	NPSH	NPRS	NPAP	NPSH
FDR (-1)	-0.00	-0.00	0.06	-0.02	0.28*	0.72
	[-0.18]	[-0.25]	[1.59]	[- 1.41]	[2.00]	[1.84]

Source: secondary data (processed)
Description: *significance at 0.05 level

Table 3 shows that, in the short-run, FDR variable is not significant for NPF across all housing sectors (residentials, apartments, and shophouses), indicating that FDR does not influence NPF in housing financing. However, in the long-run, FDR has a significant and positive impact on NPF in the apartments sector but does not affect NPF in residentials and shophouses financing.

Result of IRF and VD as shown below in Figure 2 and 3 below.

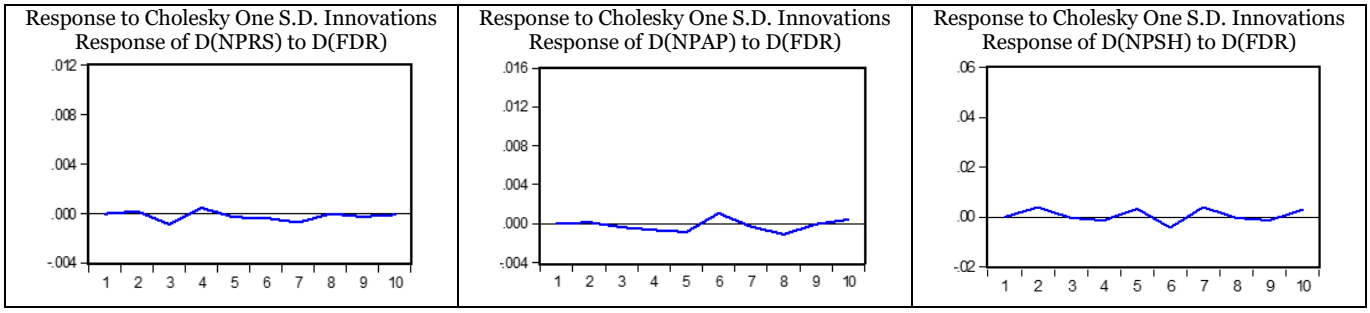

Figure 2. FDR Impulse Response
Source: secondary data (processed)

The impact of FDR on housing NPF fluctuated throughout the pandemic period, particularly for NPSH. For NPRS, after experiencing fluctuations in the second period, it dropped below zero in the fifth period and stabilized around the equilibrium line after the seventh period. The shock of FDR on NPAP remained around zero during the first three periods, then declined and fluctuated from the fifth period onward. The percentage increase in NPSH occurred during the first two periods, followed by fluctuations until the end of the observation period

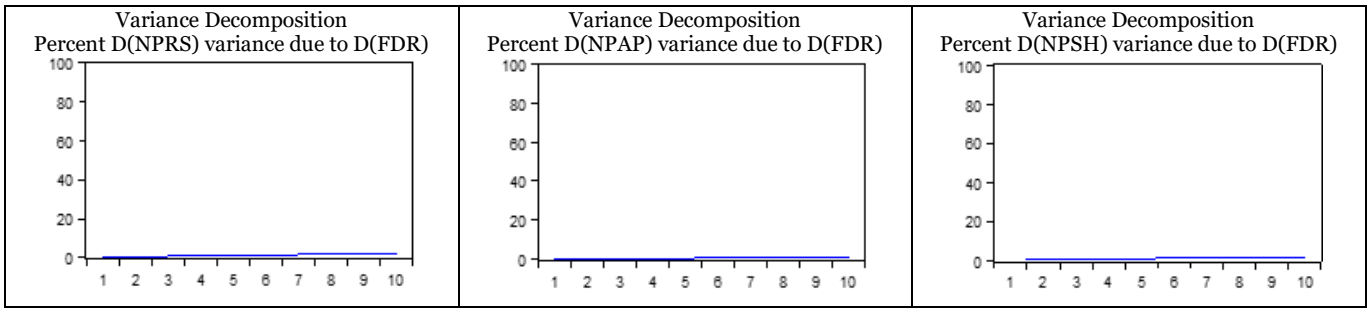

Figure 3. FDR Variance Decomposition
Source: secondary data (processed)

In general, FDR had minimal impact during the first period. Its strongest influence on NPF occurred in the eighth period, reaching 1.73% in shophouse (NPSH) and 1,23% in apartments (NPAP) sector.

DISCUSSION

Islamic banking plays a crucial role in the financial system by adhering to Islamic principles that emphasize fairness, transparency, and the prohibition of riba. One of its primary functions is channeling public funds into productive and consumptive financing to drive economic growth, particularly in the real sector. The Sharia-compliant contracts used in housing finance in Indonesia include Murabaha, Musharakah Mutanaqisah, Ijarah Muntahiyah Bittamlik, and Istisna'. During the pandemic, one of the key challenges faced by Islamic banks was managing the quality of their financing, particularly in terms of Non-Performing Financing (NPF). As seen in Table 3 above, FDR has an impact on NPF apartments financing sector (NPAP) in the long-run. The positive effect on the NPF apartments (NPAP) suggests that a higher FDR leads to an increase in NPF. Expansive financing strategies may sometimes prompt banks to adopt less conservative financing assessments, although financing quality remains acceptable under prevailing conditions. This trend is reflected in Islamic banking statistics, where the average financing growth during the pandemic as seen in Table 1 (period of 2020 – June 2023) in the apartments financing (14.12%) was higher than in residentials (12.47%) and shophouses (2.72%). The significant positive relationship between FDR and NPF aligns with previous research findings Rahman *et al.* (2017), Suryanto (2015), Firmansyah (2014).

CONCLUSION

This study employs Vector Error Correction Model (VECM) to examine the relationship between housing ownership Non-Performing Financing (NPF) and a key bank-specific variable, FDR, during the COVID-19 pandemic period (March 2020 – June 2023). The estimation and analysis yield three key findings. First, FDR does not have a significant impact on NPF in residentials financing during the pandemic. Second, FDR has a significant long-term effect on NPF in apartments financing during the pandemic. Third, FDR does not have a significant impact on NPF in shophouses financing during the pandemic. These results indicate that FDR only affects NPF in the apartments financing sector in the long-run during the COVID-19 pandemic. These findings provide valuable insights into how FDR influences NPF in housing financing during the pandemic. Ensuring the long-term growth and stability of housing financing depends on effective synergy between banks and relevant stakeholders. This includes regulatory relaxations, economic incentives and stimulus programs, innovative housing financing products, digitalization of services, and initiatives to promote subsidized homeownership for low-income groups. Such efforts are crucial in maintaining the stability of the housing finance sector, as the property industry remains one of the key drivers of the real sector.

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