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SECTORAL FINANCING CONCENTRATION AND PROFITABILITY OF ISLAMIC BANKING IN INDONESIA

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ABSTRACT - This paper investigates the extent to which sectoral financing concentration affects the Islamic banks' profitability in Indonesia. As additional control variables, we include bank-specific and macroeconomic conditions. This study utilizes the aggregated financial statements of Islamic banks in Indonesia from January 2010 through December 2019 and analyzed with the Autoregressive distributed lag (ARDL) model. The results confirm cointegration evidence, demonstrating the long-term relationship between the dependent and independent variables. The results clearly indicate that sectoral financing concentration increases the profitability of Islamic banks. Furthermore, excessive financing and high non-performing financing reduce the profitability of Islamic banks. As a financial sector, Islamic banks' performance is contingent on favorable economic and macroeconomic conditions, such as high economic growth and low inflation. These findings imply that Islamic banks must employ skilled workers who are experts in related economic sectors, which is one of the primary goals of Islamic bank financing.
Keywords: Islamic banks, sectoral financing concentration, profitability, ARDL

***ABSTRAK* – Konsentrasi Pembiayaan Sektoral dan Profitabilitas Bank Syariah di Indonesia.** Tulisan ini mengkaji sejauh mana konsentrasi pembiayaan sektoral mempengaruhi profitabilitas bank syariah di Indonesia. Sebagai variabel kontrol tambahan, kami menyertakan kondisi spesifik bank dan variabel makroekonomi. Penelitian ini menggunakan agregat laporan keuangan bank syariah di Indonesia dari Januari 2010 sampai Desember 2019 dan dianalisis dengan model Autoregressive distributed lag (ARDL). Hasil kajian mengkonfirmasi bukti kointegrasi, yang menunjukkan hubungan jangka panjang antara variabel dependen dan independen. Hasil kajian memperjelas bahwa konsentrasi pembiayaan sektoral dapat meningkatkan profitabilitas bank syariah, sementara pembiayaan yang berlebihan dan pembiayaan bermasalah yang tinggi mengurangi profitabilitas bank syariah. Sebagai institusi yang bergerak di sektor keuangan, kinerja bank syariah sangat bergantung pada kondusifitas sistem ekonomi dan kondisi makroekonomi, seperti pertumbuhan ekonomi yang tinggi dan inflasi yang rendah. Temuan ini menyiratkan bahwa bank syariah harus mempekerjakan pekerja terampil yang ahli di sektor ekonomi terkait, yang merupakan salah satu tujuan utama pembiayaan bank syariah.
Kata kunci: Bank syariah, konsentrasi pembiayaan sektoral, profitablitas, ARDL

INTRODUCTION

Islamic banking, sukuk (Islamic bonds), Takaful (Islamic insurance), Islamic funds, and other Islamic Financial Institutions are all part of the Islamic finance industry. According to total assets and the number of institutions, the Islamic finance industry is rapidly expanding. Total assets in 2012 were US $1.761 trillion, rising to US $3.374 trillion in 2019 with 1,595 total Islamic institutions worldwide, according to the Islamic Finance Development Report (IFDR). The largest financial industry in the Islamic finance industry is Islamic banking. 527 Islamic banks held $2.349 trillion in total Islamic banking assets, accounting for 70% of total Islamic financial assets (IFDR, 2021).

As the world's largest Muslim country, Indonesia pioneered Islamic banking in 1992 with the passage of Law No. 7/1992, which allows a bank to apply for profit-loss sharing contracts (Widarjono, 2018). However, when compared to other Muslim countries, Indonesia is late in adopting Islamic banking. Following the ratification of Banking Law No. 21/2008 by the government, the number and assets of Islamic banks increased rapidly (Widarjono, Mifrahi, & Perdana, 2020; Aulia, Ibrahim, & Tarigan, 2020). With 34 Islamic banks and total assets of US $38 billion in 2019, Indonesia has risen to the tenth largest country in the world banking industry. The government has merged three state-owned banks to strengthen Islamic banking in Indonesia, and their combined assets of US $14 billion are expected to accelerate Islamic economic development in Indonesia (IFDR, 2021).

As a financial intermediary, an Islamic bank performs two main functions: funding and credit. The goal of credit or financing activity is to maximize bank performance (Daud et al., 2016; Ibrahim, & Salam, 2021). As a result, Islamic banks' primary concern as financial intermediaries is credit risk management (Abedifar, Molyneux, & Tarazi, 2013; Muarif, Ibrahim, & Amri, 2021). One of the critical issues in financing risk management is how banks diversify their financing across economic sectors in order to reduce the risk of non-performing loans (NPF).

A well-managed financing risk appears to support the performance of Islamic banks (Abedifar, Molyneux, & Tarazi, 2013; Hassan, Khan, & Paltrinieri, 2019; Nisak, & Ibrahim, 2014). Diversification of financing can boost the profitability of Islamic banks in Southeast Asian countries with dual banking systems (Chen, Liang, & Yu, 2018). Diversification of financing through

various financing contracts can also reduce the NPF of Islamic banks in Indonesia (Widarjono & Rudatin, 2021; Nadia, Ibrahim, & Jalilah, 2019). Other findings indicate that the NPF of Islamic rural banks in Indonesia has decreased as a result of financing diversification (Widarjono, Anto, & Fakhrunnas, 2020). Loan diversification in various economic sectors boosts profitability and reduces non-performing loans (NPLs) for Indonesian conventional banks (Prastiwi & Anik, 2020). However, research into the impact of financing diversification in various economic sectors on the performance of Islamic commercial banks in Indonesia is still uncommon.

This paper examines the impact of financing diversification in various economic sectors on the profitability of Islamic commercial banks in Indonesia. However, research into the impact of financing diversification on Islamic bank profitability is still rare. As a result, our research aims to bridge the empirical literature gap by investigating the effects of financing diversification in various economic sectors on the profitability of Indonesian Islamic commercial banks.

Our paper is formatted as follows: The first section provides context, including the study's contribution. The following section emphasizes the existing empirical study. The method and data are discussed in the third section. The fourth section presents the findings and discussion. Finally, the final section provides a conclusion.

LITERATURE REVIEW

The primary issue that has become the subject of an ongoing debate regarding the profitability of banks is which policy, loan concentration or loan diversification, should be implemented. According to the concentration-stability hypothesis, some financial institutions make the decision to focus their lending on specific economic sectors in order to ensure both continued profitability and the institution's continued viability. This is done so that the financial institution can gain knowledge of the specific sectors and benefit from that knowledge (Acharya, Hasan, & Saunders, 2006).

On the other hand, according to the concentration-fragility hypothesis, financial institutions choose to diversify their loan portfolios in order to reduce the risk associated with financing projects due to the problem of asymmetric information regarding the outcomes of those projects. According to the portfolio theory, financial institutions are not required to concentrate all of their loans in a single industry (Rossi, Schwaiger, & Winkler, 2009). The

performance of financial institutions can be significantly improved by diversifying their loan portfolios.

According to the classical banking theory, the theory of loan diversification posits that loan diversification is one of the ways in which a company can increase their credit lines in order to reduce the likelihood of defaulting on those lines (Diamond, 1984). Monitoring costs is necessary for loan diversification, which ensures that financial institutions only diversify when they are making a profit that is greater than the costs they have incurred. Loan diversification, followed by strong monitoring and supervision, will bring the amount of impaired loans down, but on the other hand, it will also bring down profits because of the costs associated with monitoring and supervision. A good selection of borrowers, on the other hand, will lower monitoring costs, which will in turn increase bank profits (Moudud-Ul-Huq, Ashraf, Gupta, & Zheng, 2018).

Chen, Wei, and Zhang (2013) examined the effect of sectoral concentration on Chinese banks' non-performing loans (NPL) using 16 commercial banks between the years 2007 and 2011. Their research covered the period from 2007 to 2011. According to the findings of their study, higher levels of sectoral loan concentration are associated with higher levels of non-performing loans. Kusi et al. (2020) investigated the impact of sectoral loan concentration on the profitability of Ghanaian banks during the period of 2007-2014 using 30 commercial banks as their sample. Their findings provide evidence that sectoral loan diversification increases profitability for banks, thus confirming the concentration-fragility theory.

In a similar manner, Prastiwi and Anik (2020) analyzed the impact that sectoral credit diversification had on the overall performance of Indonesian banks from 2015 to 2018 by using aggregated commercial banks as their data source. A high concentration of loans is detrimental to profitability and can lead to an increase in non-performing loans. In contrast, the findings of a study that was conducted by Hayden, Porath, and Westernhagen (2007) using 983 German banks between the years 1996 and 2002 provide evidence that loan concentration increases both the return and stability of banks, providing support for the concentration-stability theory.

In the case of Brazilian banks, having a concentrated loan portfolio not only increases profitability but also lowers the risk of default (Tabak, Fazio, &

Cajueiro, 2011) In Islamic banks, the primary concern is diversification, which can refer to either the diversification of income or the diversification of financing. Using data from 77 Islamic banks located in 20 different countries, Čihák and Hesse (2010) investigate the impact of income diversification and find that it has a positive impact on the profitability of Islamic banks.

Accordingly, Chen, Liang, and Yu (2018) found that income diversification positively links to Islamic banks' profitability. They used Islamic banks from Pakistan, Malaysia, and Indonesia during the period of 2006-2012. Moreover, Widarjono, Anto, and Fakhrunnas (2020) used data from 143 Islamic rural banks in Indonesia collected quarterly between 2013 and 2018 to demonstrate that income diversification helps reduce impaired financing. The data was gathered during the study period.

In addition, Islamic banks offer a number of interest-free financing options, including Mudharabah, Musyarakah, Murabahah, Istisna, Salam, Ijarah, and Qards. These are just a few of the terms that can be found in Islamic banking contracts. Using aggregate data from Indonesian Islamic banks from 2011-2019, Widarjono and Rudatin (2021) investigated the effect of Islamic financing diversification in various financing contracts on non-performing financing. They did this by focusing on the effect on non-performing financing. There is mounting evidence suggesting that increased financing concentration leads to impaired financing.

METHODOLOGY

This paper examines the impact of financing diversification in various economic sectors on the performance of Islamic banks in Indonesia, using some control variables comprised of bank-specific and external factors. The profitability of Islamic banks is measured using ROA. Asset, equity, efficiency, and financing risk are Islamic bank-specific factors, while inflation and domestic output are external factors. Our research relies on aggregated financial statements from Indonesian Islamic banks from January 2010 to December 2019. We use existing studies to investigate the performance of Islamic banks, such as Čihák and Hesse (2010), Kabir and Worthington (2017), and Hassan, Khan, and Paltrinieri (2019). The performance model of Islamic banks can be expressed as the following regression equation:

$$ROA_t = \emptyset_0 + \emptyset_1 HHI_t + \emptyset_2 CAR_t + \emptyset_3 FDR_t + \emptyset_4 CIR_t + \emptyset_5 NPF_t + \emptyset_6 IPI_t + \emptyset_7 CPI_t + e_t \quad (1)$$

Where ROA is the return on assets as a proxy for the profitability of Islamic banks. The Herfindahl-Hirschman index of financing (HHI) measures the diversification of financing. CAR stands for capital adequacy ratio, CIR stands for cost-income ratio, which represents operating efficiency, CPI stands for consumer price index, which measures inflation, and IPI stands for industrial production index, which measures domestic output.

The Herfindahl-Hirschman Index (HHI) is used to assess financing diversification (HHI). Agriculture, forestry, and agricultural facilities (AFA); mining (MIN); manufacturing (MAN); water, gas, and electricity (WGE); construction (CON); trade, restaurants, and hotels (TRH); transportation, cargo storage, and communication (TCC); business services (BS); social services (SS); and others (OT). the following:

$$HHI = \left(\frac{AFA}{TF}\right)^2 + \left(\frac{MIN}{TF}\right)^2 + \left(\frac{MAN}{TF}\right)^2 + \left(\frac{WGE}{TF}\right)^2 + \left(\frac{CON}{TF}\right)^2 + \left(\frac{TRH}{TF}\right)^2 + \left(\frac{TCC}{TF}\right)^2 + \left(\frac{BS}{TF}\right)^2 + \left(\frac{SS}{TF}\right)^2 + \left(\frac{OT}{TF}\right)^2 + \quad (2)$$

Where TF stands for total financing (TF). Financing diversification demonstrates how Islamic banks diversify their financing contracts across economic sectors in order to reduce impaired financing. Low HHI indicates that Islamic bank financing is more diverse, whereas high HHI indicates that financing is concentrated (Widarjono, Mifrahi, & Perdana, 2020), supporting the concentration-fragility hypothesis. In contrast, Islamic banks concentrate on a few economic sectors that are likely to generate high profits, lending credence to the concentration-stability hypothesis. As a consequence, we anticipate a negative or positive relationship between financing diversification and profitability.

The capital adequacy ratio is widely used to assess the equity of Islamic banks (%). The capital adequacy ratio (CAR) measures an Islamic bank's ability to maintain its capacity (Hamid, 2017). Holding less capital reflects Islamic banks' risk-taking behavior, resulting in increased financing. Islamic banks can increase their profits by expanding their financing through high CAR. Keeping more capital, on the other hand, indicates Islamic banks' risk-averse behavior and, as a result, likely generates less profit. Therefore, we anticipate that CAR

will have an impact on Islamic bank profitability, either positively or negatively.

FDR stands for financing deposit ratio (%), which measures bank liquidity. High FDR indicates that banks allocate more financing than they collect from depositors, and high FDR can generate more profit as a result of the increased financing. However, it is debatable because a high FDR indicates a lack of liquidity (Trinugroho et al., 2017). Low liquidity reflects banks' inability to manage an unexpected increase in assets or a decrease in financing, and this condition degrades the bank's performance and increases the high risk. As a result, we anticipate that FDR will have an impact on profitability, either positively or negatively.

CIR stands for cost-to-income ratio (%). CIR stands for operating efficiency, which measures how much it costs to generate one unit of income (Trinugroho, Agusman, & Tarazi, 2014). The high CIR indicates a high cost to generate per unit income. Accordingly, a low CIR indicates greater efficiency and vice versa. High CIR causes Islamic banks to generate low margins, resulting in low profits (Trinugroho, Risfandy, & Ariefianto, 2018). This paper anticipates that CIR will have a negative impact on profitability.

Credit risk is an important aspect of Islamic bank stability. Non-performing financing (NPF) is a credit risk measurement tool commonly used in Islamic banks. NPF is the impaired financing-to-total financing ratio (percent). The greater the NFP, the greater the bad financing, and it is difficult to recover. A high NPF indicates that the bank will be unable to generate significant profits (Ahamed, 2017; Widarjono, Mifrahi, & Perdana, 2020). As a result, this paper hypothesizes that NPF has a negative impact on Islamic bank profitability.

GDP is the market value of a country's goods and services. GDP is a measure of a country's economic growth. A rising GDP indicates increased production of goods and services, which raises income. As a result, Islamic bank profitability is linked to positive economic growth (Abedifar, Molyneux, & Tarazi, 2013; Hassan, Khan & Paltrinieri, 2019). Because monthly GDP data are unavailable, this study relies on the industrial production index (IPI). According to our findings, IPI has a positive impact on profitability.

Inflation is defined as a general increase in prices. The consumer price index is used to calculate inflation (CPI). Inflation raises the prices of goods and services, affecting customers' ability to repay loans (Priyadi et al., 2021). As a

result, rising prices will reduce banks' ability to generate income, further reducing the profitability of Islamic banks. As a result, a negative sign in CPI is predicted.

The Autoregressive Distributed Model (ARDL) is used in this case. The ARDL model provides some benefits to the time series model (Pesaran & Shin, 1998). To begin, all variables are not required to be integrated in the same order or fractionally integrated, but none are integrated at I. (2). Second, ARDL can evaluate both short-run and long-run conditions. In the ARDL model, we can write equation (1) as:

$$\Delta ROA_t = \vartheta_0 + \sum_{i=1}^{p} \vartheta_{1i}\Delta ROA_{t-1} + \sum_{i=1}^{p} \vartheta_{2i}\Delta HHI_{t-1} + \sum_{i=1}^{p} \vartheta_{3i}\Delta CAR_{t-1} + \sum_{i=1}^{p} \vartheta_{4i}\Delta FDR_{t-1} + \sum_{i=1}^{p} \vartheta_{5i}\Delta CIR_{t-1} + \sum_{i=1}^{p} \vartheta_{6i}\Delta NPF_{t-1} + \sum_{i=1}^{p} \vartheta_{7i}\Delta IPI_{t-1} + \sum_{i=1}^{p} \vartheta_{8i}\Delta CPI_{t-1} + \theta_1 ROA_{t-1} + \theta_2 HHI_{t-1} + \theta_3 CAR_{t-1} + \theta_4 FDR_{t-1} + \theta_5 CIR_{t-1} + \theta_6 NPF_{t-1} + \theta_7 IPI_{t-1} + \theta_7 CPI_{t-1} + e_t \quad (3)$$

Where Δ is the first different operator, $\vartheta_{1i} - \vartheta_{7i}$ are the short-run dynamic condition, and $\theta_1 - \theta_7$ are the long-run condition.

Furthermore, we can derive an error correction model (ECM) from ARDL model. The ECM model combines short-run dynamics and long-run equilibrium. ECM of ARDL for equation (1) can be expressed as follows:

$$\Delta ROA_t = \vartheta_0 + \sum_{i=1}^{p} \vartheta_{1i}\Delta ROA_{t-1} + \sum_{i=1}^{p} \vartheta_{2i}\Delta CAR_{t-1} + \sum_{i=1}^{p} \vartheta_{3i}\Delta FDR_{t-1} + \sum_{i=1}^{p} \vartheta_{4i}\Delta CIR_{t-1} + \sum_{i=1}^{p} \vartheta_{5i}\Delta NPF_{t-1} + \sum_{i=1}^{p} \vartheta_{6i}\Delta IPI_{t-1} + \sum_{i=1}^{p} \vartheta_{7i}\Delta CPI_{t-1} + \theta_7 ECT_{t-1} + e_t \quad (4)$$

Where ECT_{t-1} is the lag of error and θ_7 is the speed of adjustment coefficient. ECM represents a short-run condition as a disequilibrium condition since the behavior of each economic agent deviates from the equilibrium condition. This disequilibrium condition exists because of the existence of several variables that is not stationary at the level. Accordingly, this ECM model contains the lag error, denoted by ECT(-1), as a correction factor in the short run to move towards the long-run equilibrium condition. For that reason, the ECM model is suitable when ECT(-1) is negative and significant.

Some steps are required to estimate the ARDL model. The first step is stationary data. The next step is to estimate the ARDL model. As distributed lag model, the results depend on the optimal lag. Our study employs the Akaike

information criterion (AIC) and Adjusted R^2 to choose the optimal lag. Both methods are chosen for selecting the highest lag length instead of the smallest lag length. The third step is the cointegration test. The last step is to estimate the short-run and long-run coefficients.

RESULT AND DISCUSSION

The descriptive statistics of all variables are reported in Table 1. On average, the profitability (ROA) is 1.53 and is relatively stable, with a standard deviation of 0.6. This profitability is above the threshold value of 1.5% as regulated by the Indonesian Financial Service Authority to be healthy Islamic banking. The sectoral financing diversification on average is 22.48%, with a standard deviation of 2.85. Figure 2 reports the sectoral financing concentration during the studied period. HII increased steadily from 2010 to 2013 and then it was relatively stable after 2014.

Table 1. Descriptive statistics

	Mean	Std. Dev.	Maximum	Minimum
ROA	1.53	0.46	2.52	0.08
HHI	22.48	2.85	28.27	18.75
CAR	16.25	2.35	21.39	11.07
FDR	93.11	5.85	104.83	83.72
CIR	83.81	6.69	94.38	70.43
NPF	3.78	0.80	5.54	2.22
IPI	123.39	16.45	158.00	92.32
CPI	126.59	17.28	152.79	97.55

The average equity (CAR) is 16.25% and this equity exceeds the threshold value of 15% as regulated by the government. The standard deviation of CAR is 2.35, meaning that equity is stable since Islamic banks are banned from any excessive and speculative financing (Azmat, Skully, & Brown, 2015). The financing rate (FDR) on average is 93.11%, with a standard deviation of 5.85. This financing rate is high due to expansionary financing as a new Industry but it is lower than the maximum threshold of 95%. Islamic bank efficiency (CIR) is 83.81, ranging from 70.43 to 94.38, with a standard deviation of 6.69, which is overall less than the maximum rate of 95%. On average, impaired financing (NPF) is also low (3.78%), which is below the threshold of 5%. Indeed, the performance of Islamic banking in Indonesia sounds good as a new player in the banking industry.

Before estimating the ARDL, we have to check the stationarity of all variables using the unit-root test to determine their order of integration. As required for the ARDL model, every variable is not integrated of order 2 or I(2). For that reason, the unit root test is significant to warrant that each variable is I(0) or I(1).

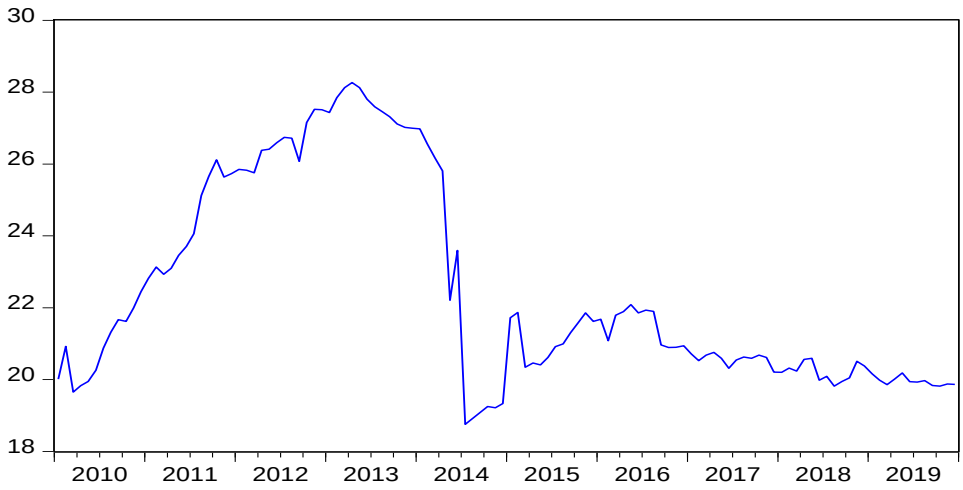

Figure 1. HHI Sectoral financing concentration

Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) are employed. Table 2 reports the results of unit-root tests. The findings report that each variable is integrated of order 1 and none are I(2). These results conclude that the ARDL approach is valid to estimate the Indonesian Islamic banks' performance.

Table 2. Unit-root test

	Level				First difference			
	ADF		PP		ADF		PP	
Variable	Constant	Trend	Constant	Trend	Constant	Trend	Constant	Trend
ROA	-3.30**	-3.41*	-3.17**	-3.09	-11.13***	-11.13***	-15.85***	-16.18***
HHI	-1.50	-2.59	-1.48	-2.37	-6.31***	-6.42***	-12.68***	-12.73***
CAR	-1.80	-2.24	-2.27	-3.34*	-11.78***	-11.73***	-13.10***	-13.04***
FDR	-1.70	-3.13	-1.56	-3.08	-12.84***	-12.88***	-12.97***	-13.01***
CIR	-1.82	-2.07	-2.50	-3.47**	-17.65***	-17.58***	-20.21***	-20.19***
NPF	-1.60	-1.63	-2.56	-2.56	-10.83***	-10.78***	-15.19***	-15.12***
IPI	0.64	-11.04***	-1.31	-11.09***	-8.09***	-8.11***	-103.85***	-105.19***
CPI	-1.18	-1.21	-1.84	-1.64	-9.78***	-9.85***	-7.23***	-7.40***

Notes: ***, **, * report significance in 1%, 5%, and 10%, respectively

We next estimate the ARDL model employing the OLS method. As dynamic model, the estimation results rely on the selected lag. This study selects a maximum lag length of up to 6. As mentioned before, our study applies AIC and Adjusted R squares to choose the optimal lag length. Table 3 reports estimation results of Islamic banks' profitability where the AIC method results in ARDL (6,0,6,4,2,0,2,5) and the adjusted R^2 method produces ARDL (6,6,6,5,6,0,2,5). The coefficient of determination (R^2) of the two methods is 0.8526 and 0.8760, indicating that both AIC and adjusted R^2 methods can explain well. The Autoregressive Conditional Heteroscedasticity (ARCH) and Lagrange Multiplier (LM) and methods are employed to check heteroscedasticity and serial correlation problems. Both the AIC and the adjusted R^2 methods pass the heteroscedasticity and serial correlation problems. The CUSUM test also indicates evidence of coefficient stability.

Table 3 ARDL: Islamic banks' profitability

	AIC		**Adjusted R^2**	
Variable	**Coefficient**	**t-statistics**	**Coefficient**	**t-statistics**
C	1.8888	1.2283	2.4110	1.3349
DROA(-1)	0.4304***	3.8942	0.4296***	3.5156
DROA(-2)	-0.0996	-0.8415	-0.2136	-1.6252
DROA(-3)	0.2660**	2.2476	0.2978**	2.3139
DROA(-4)	0.0868	0.6709	0.0386	0.2750
DROA(-5)	-0.0611	-0.5318	-0.1129	-0.8461
DROA(-6)	-0.2577**	-2.3130	-0.1810	-1.3599
HHI2	0.0420**	2.0746	0.0263	0.6084
HHI2(-1)	-	-	0.0179	0.3639
HHI2(-2)	-	-	0.0129	0.2487
HHI2(-3)	-	-	0.0221	0.4417
HHI2(-4)	-	-	-0.0123	-0.2543
HHI2(-5)	-	-	0.0593	1.2057
HHI2(-6)	-	-	-0.0969**	-2.2344
CAR	-0.0033	-0.1181	-0.0109	-0.3756
CAR(-1)	-0.0627**	-2.0210	-0.0593*	-1.8916
CAR(-2)	0.1395***	4.3338	0.1437***	4.3052
CAR(-3)	-0.0160	-0.4899	-0.0442	-1.2162
CAR(-4)	0.0195	0.6290	0.0471	1.4253
CAR(-5)	-0.0024	-0.0815	-0.0239	-0.7361
CAR(-6)	-0.0448*	-1.7685	-0.0315	-1.1569

	AIC		Adjusted R^2	
Variable	**Coefficient**	**t-statistics**	**Coefficient**	**t-statistics**
FDR	0.0086	0.6501	0.0132	0.9451
FDR(-1)	-0.0093	-0.6228	-0.0109	-0.6925
FDR(-2)	0.0097	0.5856	0.0140	0.8085
FDR(-3)	0.0071	0.4265	-0.0065	-0.3567
FDR(-4)	-0.0366**	-2.6152	-0.0410**	-2.1973
FDR(-5)	-	-	0.0166	1.1362
CIR	-0.0229**	-2.3338	-0.0370***	-2.8515
CIR(-1)	0.0021	0.2339	0.0119	1.0574
CIR(-2)	0.0263***	2.7355	0.0167	1.4569
CIR(-3)	-	-	-0.0090	-0.9277
CIR(-4)	-	-	0.0042	0.4278
CIR(-5)	-	-	-0.0120	-1.3208
CIR(-6)	-	-	0.0183**	2.0799
NPF	-0.1197*	-1.7891	-0.1060	-1.5214
IPI	0.0039	0.6009	0.0057	0.8362
IPI(-1)	0.0100	1.6445	0.0119*	1.7487
IPI(-2)	0.0191***	3.1170	0.0184***	2.7030
CPI	0.0444	0.9376	0.0689	1.3021
CPI(-1)	0.0285	0.3796	0.0282	0.3402
CPI(-2)	0.0342	0.4173	0.0274	0.3120
CPI(-3)	-0.0601	-0.7549	-0.0949	-1.1032
CPI(-4)	0.0538	0.7474	0.0949	1.1797
CPI(-5)	-0.1384***	-2.9982	-0.1615***	-2.9563
R-squared	0.8526		0.8760	
Diagnostic test				
LM	0.0067		0.0088	
ARCH	0.9167		1.8940	

Notes: ***, **, * report significance in 1%, 5%, and 10%, respectively.

Having estimated the coefficient of the ARDL model, then the next step is to test cointegration to check long rung relationship between variables, employing the bound testing approach (Pesaran, Shin, & Smith, 2001).

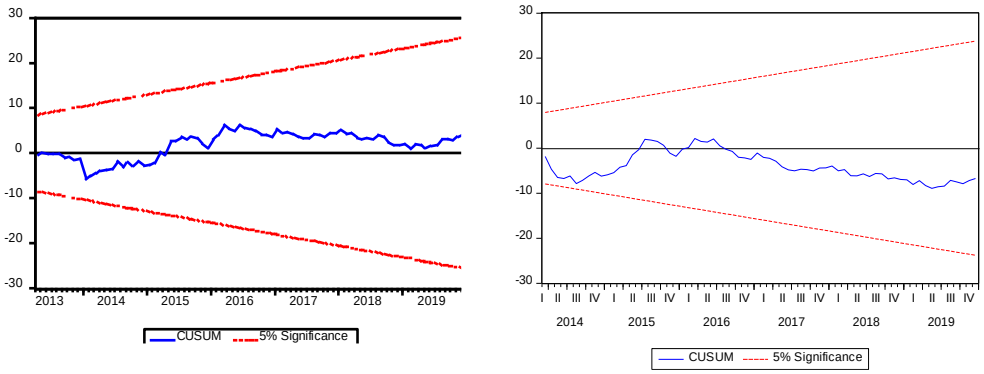

Figure 2. Stability test of ROA

The cointegration exists if F-statistics (F_{PSS}) is higher than the upper bond and otherwise it is no evidence of cointegration. Table 4 present the cointegration results. Our study has two models, and all F-statistics are greater than the upper bound at $\alpha = 1\%$ or $\alpha = 5\%$, meaning that evidence of long-run relationship among variables is found. Our study shows fractionally integrated and cointegration. Therefore, we can further estimate both long-run and short-run conditions.

Table 4. Cointegration

Model	**F-statistic**	***α***	**Lower bound**	**Upper bound**
ROA: AIC	3.8147**	10%	1.92	2.89
ROA: Adjusted R^2	4.1147***	5%	2.17	3.21
		1%	2.73	3.90

Table 5 reports the long-run coefficient of Islamic banks' performance. We start with HHI, which shows the diversification of financing in various economic sectors as the main concern of this research. The HHI is positive and significant, which implies that the concentration of financing in some economic sectors increases the profitability of Islamic banks. As a new banking industry in Indonesia, Islamic banks are more focused on certain sectors that are likely to generate high profits. There are several reasons. First, banks focus on certain sectors because Islamic banks are prohibited from conducting excessive financing and are prohibited from speculating (Beck, Demirgüç-Kunt, & Merrouche, 2013; Widarjono, Anto, & Fakhrunnas, 2020). Second, Islamic banks do not have experience channeling financing, so they focus on specific sectors to build their sectoral core competence avoid high impaired financing (Risfandy et al., 2020).

Our results confirm the concentration stability hypothesis. Islamic banks have to build up their core competence to benefit from competitive advantage through sectoral financing concentration. By concentrating their financing activities on specific sectors or groups of sectors, a bank can learn and benefit from the expertise of the given sectors and likely generate more profit (Acharya Hasan, & Saunders, 2006). Our study supports the existing empirical studies that sectoral financing concentration supports bank's performance, such as Hayden, Porath, and Westernhagen (2007) for German banks, Bebczuk and Galindo (2008) for Argentine Banks and Tabak, Fazio, and Cajueiro (2011) for Brazilian banks.

Table 5. Long-run coefficient: Islamic banks' performance

	AIC		**Adjusted R^2**	
	Coefficient	**t-statistics**	**Coefficient**	**t-statistics**
C	2.9738	1.2592	3.2515	1.4492
HHI	0.0661**	2.4136	0.0395*	1.3365
CAR	0.0468	1.1551	0.0285	0.7454
FDR	-0.0323**	-2.4581	-0.0196*	-1.4386
CIR	0.0088	0.5188	-0.0092	-0.4894
NPF	-0.1885**	-1.8536	-0.1430**	-1.5594
IPI	0.0519***	3.0129	0.0486*	2.5304
CPI	-0.0593***	-3.2436	-0.0498**	-2.3202

Notes: ***, **, * report significance in1%, 5%, and 10%, respectively.

Next, we analyze the bank-specific control variables. CAR does not affect ROA and FDR has a negative effect on ROA. These results indicate that high financing reduces the profitability of Islamic banks in Indonesia. The average FDR rate in the study period was 93.11% and this FDR rate is very high for Islamic banks as a new banking industry in Indonesia. The high FDR causes a high risk of financing, which lowers Islamic banks' profitability (Chamberlain, Hidayat, & Khokhar, 2020). However, this finding contradicts the study by Trinugroho et al. (2017) in the case of Islamic rural banks in Indonesia, for which FDR strengthens the profitability of Islamic rural banks.

The cost-to-income ratio (CIR), which measures operating efficiency, has no effect on ROA. The plausible reason is that this level of inefficiency is still below the maximum 95% rate regulated by the Indonesian Financial service authority as a policymaker. The average level of operational inefficiency of Islamic banks is 84%, with a maximum rate of 94% and a minimum rate of

70% in the study period. However, the results of this study are not in line with the case of Islamic rural banks (Trinugroho et al., 2017). The inefficiency of Islamic rural banks has a negative effect on bank profits because Islamic rural banks, as small Islamic banks, are more vulnerable to bank-specific factors than big Islamic banks (Ibrahim & Rizvi, 2017).

As hypothesized, NPF, which measures a bad financing rate, is negative and significant on ROA, implying that high bad financing lowers Islamic banks' profitability. The high impaired financing trims down the Islamic banks' ability to increase financing because of the previous high bad financing, reducing Islamic banks' profitability (Sutrisno & Widarjono, 2018). The finding is in accordance with Warninda (2014) and Widarjono, Mifrahi, and Perdana (2020) for Indonesian Islamic rural banks.

The last discussion is the macroeconomic control variables as external factors. As expected, GDP positively influences ROA. These findings imply that an economic upturn through high economic growth increases the profitability of Islamic banks. Economic growth will increase income, so consumers' ability to repay their obligation is up and thus increase profitability (Priyadi et al., 2021). Inflation has a negative effect on ROA. The increase in prices has reduced the ability of consumers to repay their financing due to a decrease in the nominal money, reducing the profitability of Islamic banks (Widarjono & Rudatin, 2021). These findings confirm the existing study that good economic condition through high economic growth and low inflation supports the profitability of Islamic banks (Srairi, 2019).

Table 6 presents the ECM-ARDL estimation that is selected by AIC and Adjusted R^2 for ROA. The coefficients of determination (R^2) are relatively high, ranging from 0.5359 to 0.9788. All error correction variables are negative and significant, indicating the ECM-ARDL is valid to capture the short-run condition. In addition, these results strengthen our earlier results that HHI, CAR, FDR, CIR, NPF, IPI, and CPI are cointegrated with ROA. Moreover, the pace of adjustment is quick, varying from 63.52 to 74.15 percent, implying that, on average, the previous period's disequilibrium is adjusted by about 63.52-74.15 percent in the following month.

The results report that the lags of the ROA influence the current ROA in the short run. These results imply that the current profitability relies on the previous profitability. Like in the long run, financing concentration positively affects

profitability. As expected, CAR influences negatively or positively on profitability. For instance, D(CAR(-1)) affect negatively but D(CAR(-4)) and D(CAR(-5)) influence positively to profitability. FDR positively affects profitability, confirming the results conducted by Trinugroho et al. (2017). Contrary to the long-run condition, inefficiency in operating links negatively to profitability in the short-run condition, supporting the findings obtained by Risfandy et al. (2017). However, inflation positively supports profitability, but economic upturn negatively weakens profitability in the short-run condition.

Table 6. ECM-ARDL: Islamic Banks' Profitability

	AIC		**Adjusted R^2**	
Variable	**Coefficient**	**t-statistics**	**Coefficient**	**t-statistics**
D(DROA(-1))	0.0656	0.5734	0.1711	1.3981
D(DROA(-2))	-0.0340	-0.3055	-0.0425	-0.3437
D(DROA(-3))	0.2320**	2.1305	0.2553**	2.0121
D(DROA(-4))	0.3188***	3.1184	0.2939**	2.4152
D(DROA(-5))	0.2577***	2.7090	0.1810	1.5856
D(HHI)	-	-	0.0263	0.7391
D(HHI(-1))	-	-	0.0149	0.4475
D(HHI(-2))	-	-	0.0278	0.7641
D(HHI(-3))	-	-	0.0499	1.5476
D(HHI(-4))	-	-	0.0375	1.1113
D(HHI(-5))	-	-	0.0969***	2.7688
D(CAR)	-0.0033	-0.1435	-0.0109	-0.4718
D(CAR(-1))	-0.0957***	-4.1002	-0.0913***	-3.9447
D(CAR(-2))	0.0437*	1.8727	0.0524**	2.0864
D(CAR(-3))	0.0277	1.1575	0.0082	0.3302
D(CAR(-4))	0.0472**	2.0964	0.0554**	2.3607
D(CAR(-5))	0.0448**	1.9947	0.0315	1.3303
D(FDR)	0.0086	0.7521	0.0132	1.1120
D(FDR(-1))	0.0198	1.6383	0.0169	1.3741
D(FDR(-2))	0.0295**	2.3830	0.0309**	2.4010
D(FDR(-3))	0.0366***	2.9200	0.0244*	1.8464
D(FDR(-4))	-	-	-0.0166	-1.2941
D(CIR)	-0.0229***	-2.7281	-0.0370***	-3.6981
D(CIR(-1))	-0.0263***	-3.0939	-0.0183	-1.6545
D(CIR(-2))	-	-	-0.0016	-0.1484
D(CIR(-3))	-	-	-0.0105	-1.0402
D(CIR(-4))	-	-	-0.0063	-0.6555

	AIC		Adjusted R^2	
Variable	**Coefficient**	**t-statistics**	**Coefficient**	**t-statistics**
D(CIR(-5))	-	-	-0.0183**	-2.3285
D(IPI)	0.0039	0.8154	0.0057	1.1066
D(IPI(-1))	-0.0191***	-3.9558	-0.0184***	-3.5920
D(CPI)	0.0444	1.1428	0.0689	1.5928
D(CPI(-1))	0.1106**	2.4700	0.1341***	2.7024
D(CPI(-2))	0.1448***	2.9592	0.1615***	3.2005
D(CPI(-3))	0.0847**	1.9490	0.0666	1.3930
D(CPI(-4))	0.1384***	3.5821	0.1615***	3.7288
EC_{t-1}	-0.6352***	-6.1419	-0.7415***	-6.4237
R-squared	0.5359		0.6098	

Notes: ***, **, * report significance in1%, 5%, and 10%, respectively.

CONCLUSION

As a financial intermediary, Islamic banks are extremely vulnerable to economic shocks. Furthermore, as a new financial industry in Indonesia, Islamic banks must compete with conventional banks. As a result, a study on the performance of Islamic banks is critical to determining the sustainability of Islamic banks in Indonesia, a country with a Muslim majority. The purpose of this research is to examine the impact of sectoral financing diversification on the profitability of Islamic banks using internal and external control variables. Equity, financing rate, operating efficiency, and financing risk are bank-specific control variables, while inflation and domestic output are external control variables.

The findings show that sectoral financing concentration improves Islamic bank profitability. This conclusion is reasonable given that Islamic banks, as new players in Indonesian banking, have no experience channeling their funds. They should concentrate their efforts on high-profit sectors. Furthermore, sectoral financing concentration is critical for Islamic banks to develop sectoral core competencies. Extensive financing and high bad debt also reduce Islamic banks' profitability. Macroeconomic conditions have a significant impact on Islamic banks. Good macroeconomic conditions, such as low inflation and high economic growth, boost Islamic banks' profitability.

These findings are critical for Islamic banks and regulators in supporting Islamic bank performance. To gain a competitive advantage, every Islamic

bank must be able to develop sectoral core competencies. To accomplish this, Islamic banks must hire employees with strong economic sector skills and train existing employees to be more knowledgeable about economic sector behavior. Indeed, NPF has a significant negative impact on the profitability of Islamic banks. Therefore, the Indonesian financial services authority, as the regulator, must improve Islamic banks' corporate governance by mitigating impaired financing. As a result, monitoring and controlling financing is critical for reducing financing risk.

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