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Measuring stability in Islamic rural banks: The influence of bank concentration and capital

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Abstract

The Islamic Rural Bank, commonly referred to as BPRS in Indonesia, is a vital player in the country's economic landscape, providing limited banking services rooted in Islamic principles. BPRS serves as an economic catalyst across various regions, including both urban and rural areas, thereby shaping the level of concentration, capital ownership, and stability in the financial sector. This study centers its focus on BPRS, a unique financial institution that contributes significantly to the nation's economy. The research, conducted throughout Indonesia in 2020 from the first to the fourth quarter, offers fresh insights into BPRS as a subject of study. By employing quantitative methods, the study endeavors to explore the impact of concentration and capital ownership on the stability of BPRS in Indonesia. Interestingly, the findings in this research suggest that concentration levels don't provide a clear explanation of the relationship between BPRS concentration and stability. On the other hand, BPRS capital ownership is positively and significantly related to stability, indicating that a strong capital base enhances the overall stability of these Islamic rural banks. These results offer valuable insights into the financial dynamics of BPRS in Indonesia, providing essential information for policymakers and stakeholders as BPRS continues to drive the nation's economic development.

Keywords: BPRS; bank concentration; capital; stability

1. Introduction

The world is witnessing the rapid development of the Sharia banking industry, and Indonesia, as a country with a majority Muslim population, is playing a role in advancing the Sharia banking sector globally. According to the 2018 Global Islamic Finance Report, Indonesia is ranked sixth in the "Islamic Finance Industry" worldwide, only behind countries such as Malaysia, Iran, Saudi Arabia, the United Arab Emirates, and Kuwait. In Indonesia itself, the development of the Sharia banking industry began with the emergence of Bank Muamalat Indonesia (BMI) in 1991 (Suryani, 2012), which then multiplied until there were 14 Islamic Commercial Banks, 20 Shariah Business Units, and 164 Shariah Rural Banks (OJK, 2020).

Having a majority Muslim population does not make Sharia banking the primary choice for every community in Indonesia. However, some literature states that the number of conventional banks in Indonesia still has a more significant number than Sharia banks. This is proven by the number of BPRs totaling 1,584 banks, with only 164 BPRS in Indonesia (CNBC, 2023). In fact, the Indonesian government has issued Law No. 4 of 2023, which aims to develop and strengthen the national financial system, both conventional and sharia systems.

In addition, the experience of the 2008 Global Financial Crisis (GFC) provided many valuable lessons for all stakeholders in the financial sector. This crisis has prompted discussions around market forces, including issues of concentration and the role of bank capital in maintaining the sustainability of the banking sector (Mirzaei et al., 2013). This is related to Berger and Bouwman (2013), which state

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that banks with more capital have a greater probability of survival and have a significant positive impact on efficiency and innovation in producing financial services (Claessens and Laeven, 2003).

Previous research reveals that Islamic Banks (BI) have demonstrated stronger resilience during periods of financial crisis despite the absence of international prudential regulations that focus on specific risks in the Islamic financing industry (Farooq and Zaheer, 2015; Pappas et al., 2017)). Two main factors can explain this resilience. First, the core characteristics of the Islamic financial system involve guaranteed transactions with real assets and the principle of profit and loss sharing (Daoud and Kammoun, 2020). Second, adequate capital levels ensure that the bank has sufficient capital resources to support its activities and sufficient net worth to cover the depreciation of its assets without facing the risk of bankruptcy (Daoud and Kammoun, 2020).

Likewise, adequate levels of capital help banks, including Islamic banks, maintain their stability and protect themselves from the risk of bankruptcy. In this context, it is necessary to explore the extent to which banks, especially smaller ones, have access to sufficient capital to face economic and financial challenges. Through an in-depth understanding of these issues, it is hoped that the Sharia banking industry in Indonesia can continue to grow, become more inclusive, and become the main choice for various levels of society. This will also help increase the banking sector's resilience amidst global economic uncertainty.

This research focuses on Islamic Community Banks (BPRS) because until now, there has been little in-depth research on this institution, making topics surrounding BPRS in Indonesia still very interesting to explore. Although several studies, such as those conducted by Trinugroho et al. (2017), Trinugroho et al. (2018), Wasiaturrahma et al. (2020), and Risfandy and Pratiwi (2022) have discussed about Islamic banks and BPRS in Indonesia, these studies have not explored the topics of banking concentration, banking capital, and banking sector stability. Therefore, this research aims to fill this knowledge gap and provide deeper insight into these issues in the BPRS context.

2. Literature review

Bank concentration

The concentration-stability paradigm, also known as the franchise value paradigm, was first proposed by Keeley (1990), which states that banks operating in concentrated markets tend to be more cautious in dealing with risk based on the positive margin effect hypothesis. Additionally, in a concentrated banking system, banks can increase profits by using higher interest rates or reducing loan loss provisions, as Boyd et al. (2004) observe. This is because the greater the value of the franchise, the higher the opportunity costs for the bank when facing bankruptcy, so banks may be reluctant to accept risky investments that could jeopardize future profits, as explained by (Hellmann et al., 2000). Allen and Gale (2004) also emphasized that supervision of several banks in a concentrated banking system becomes easier, especially when several large banks have more diversified portfolios. This resulted in the resilience of the concentrated banking system to risks becoming more apparent and ultimately resulted in a reduction in the number of crises, as observed in their research.

Operating in a more concentrated market environment and leveraging monopoly power in the loan market tends to increase loan interest rates, as noted by Boyd and De Nicoló (2005). This, in turn, can create moral risk and result in banks eliminating lower-risk customers, as discussed by Berger et al. (2009), or even make it difficult for customers to pay off loans, as researched by Mirzaei et al. (2013). In this context, the risk of default becomes higher. At the same time, large banks have an important role because their failure can pose a significant risk of failure of financial institutions and the financial system as a whole, as happened during the crisis in the United States noted by De Haan and Poghosyan (2012a) and De Haan and Poghosyan (2012b).

The impact could also have a negative impact on the monetary system and real production. To maintain financial stability, institutions deemed "too big to fail" may be protected implicitly or explicitly through public guarantees or subsidies, as observed during and after the Global Financial Crisis (GFC). These measures, in turn, may increase incentives to take risks and thereby increase banking vulnerabilities, as Mishkin (1999) noted.

Bank capital

Stricter capital requirements are critical to ensure that banks can secure sufficient sources of liquidity and still be able to absorb unexpected losses. Theoretical studies emphasize the importance of moral hazard problems in lending and investment activities. Higher capital levels encourage banks to adopt lower-risk activities because incentives to shift risk are minimized (Calomiris and Kahn, 1991; Freixas and Rochet, 2008). Higher capitalization also requires more efficient loan monitoring and better credit risk management (Coval and Thakor, 2005; Allen et al., 2011; Mehran and Thakor, 2011). Capital increases allow banks to build buffers to reduce the risk of contagious defaults caused by systemic risks or macroeconomic shocks (Kaufman and Scott, 2003).

Laeven et al. (2016) examined the role of bank capital on systemic risk during the 2007-2009 global recession and found an inverse relationship between systemic risk and bank capital. Berger and Bouwman (2013) also present evidence that higher capitalization increases the likelihood of bank survival in the United States. Similar findings regarding the inverse relationship between risk and bank capital have also been found by other studies such as Godlewski (2005), Lee and Hsieh (2013), Tan and Floros (2013), Maji and Hazarika (2016), Ding and Sickles (2018), and Jiang et al. (2020).

However, it is also important to note that increasing bank capital may also carry the risk of reducing the banking system's stability. More capital can increase investment risk and volatility (Koehn and Santomero, 1980). Besanko and Kanatas (1996) argue that bank insiders may reduce management efforts when their holdings are diluted due to capital increases.

Banking concentration and stability

Banking concentration is often used as a proxy for competition. However, in its development, the use of concentration proxies in measuring banking competition is often considered weak, and concentration has different characteristics compared to competition (Claessens and Laeven, 2004). Therefore, it can be stated that concentration and competition are different and independent variables. This research focuses on the level of banking concentration as an independent variable, which will then influence stability as the dependent variable.

In connection with this, two views state the relationship between the level of banking concentration and stability, namely concentration-stability and concentration-fragility (Uhde and Heimeshoff, 2009). Concentration-stability is of the view that as the level of banking concentration increases, the level of stability will also increase. On the contrary, concentration-fragility states that as the banking concentration level increases, the banking stability level will decrease. Studies that support the view of concentration-stability, like Tran et al. (2022) and Phan et al. (2019), state that increasing banking market concentration positively affects stability.

Contrary to the results of studies that support this view of concentration-stability, Fu et al. (2014), Thakor (2014), and Kasman and Kasman (2015) state that increasing banking market concentration will cause an increase in the level of risk-taking which will result in reduced stability.
H_1: Banking concentration has a negative effect on banking stability

Capital ownership and banking stability

Capital is important for banking institutions to survive in a financial market that continues to develop. Therefore, appropriate provisions are needed to ensure that a bank can survive and avoid bankruptcy. Several studies, such as Anginer et al. (2018), Danisman and Demirel (2019), and Tran et al. (2022), state that increasing capital can increase banking stability. This is because banks with increased capital will cause a decrease in the level of risk, which causes the bank to become more stable.

However, the results of these studies are inversely proportional to research from Oduor et al. (2017). By using the objects of banks in African countries, Oduor et al. (2017) stated that capital regulations reduce banking stability in these countries. This is because the level of risk experienced by these banks continues to increase, which then causes banking stability to decline.
H_2: Capital ownership has a positive effect on banking stability

Concentration, capital ownership, and banking stability

In their research, Kasman and Kasman (2015) stated that increasing concentration in the banking market could reduce financial stability. The research supports the views of Fu et al. (2014), which also gives similar results where increasing market concentration causes fragility in the financial

sector. Both studies support the view of concentration-fragility, which states that an increase in the banking market concentration will cause bank stability to decrease because the level of risk-taking increases.

Apart from these two studies, other studies support this view of concentration-fragility. Mirzaei et al. (2013) and Schaeck et al. (2009) state that increasing banking concentration will cause financial instability. Contrary to the views in these studies, the latest research put forward by Tran et al. (2022) states that banking concentration increases stability.

Increasing or decreasing concentration in the banking market can affect financial stability. Another factor that can also influence decision-making regarding risks that influence the level of stability is capital ownership. In their research, Tran et al. (2022) stated that increasing capital will cause banks to make decisions with low risk, and making decisions with low risk will have an effect on increasing banking stability. Other studies that also provide similar results are Thakor (2014) and Anginer et al. (2018), which also state that increasing capital can increase stability. These studies are inversely proportional to research by Oduor et al. (2017), which states that increasing capital will cause financial instability in African countries.

In this regard, views of concentration-fragility state that an increase in banking concentration will lead to a decrease in stability, whereas banks with a high level of market concentration will increase risk-taking behavior in banking. With increased concentration reducing stability, banks with increased capital can anticipate increased risk caused by decreasing market concentration by making decisions that have lower risk. In this case, an increase in banking concentration will cause capital to also increase, which in turn will have an effect on increasing stability because the level of risk-taking will be low.

3. Method

Data

This research uses secondary data collected from the Financial Services Authority – OJK via their website (*cfs.ojk.go.id*). By using quarterly data collected through this page, this research uses data from four quarters, namely 2020q1 to 2020q4. Apart from that, GDRP and inflation data are collected from the BPS website for each province in Indonesia.

Methodology

This research uses research by Tran et al. (2022) as a reference. In its development, this research itself used a panel data regression method with a model random effect, which is then formulated with the following equation:

$$Stability_{i,t} = \alpha + \alpha_1 Stability_{i,t-1} + \alpha_2 Concentration_{i,t} + \alpha_3 Capital_{i,t} + \alpha_4 Control\ variables_{i,t} \ldots (1)$$

Then, this research also uses interaction variables to investigate the effect of capital on stability (Concentration*Capital) with the following equation:

$$Stability_{i,t} = \beta + \beta_1 Stability_{i,t-1} + \beta_2 Capital_{i,t} + \beta_3 Concentration * Capital_{i,t} + \beta_4 Control\ variables_{i,t} \ldots (2)$$

i	: Number of observations
t	: Time period
Stability	: Level of banking stability
Capital	: Banking capital ownership
Concentration	: Level of banking concentration
Control variables	: Control variables used in this research
Concentration*Capital	: Interaction variable between concentration and banking capital

Dependent variable

In this study, the dependent variable used is stability, which is proxied by logZROA, the natural logarithm of the Z-Score calculation on Return-on-Asset (ROA). A higher logZROA can be interpreted

as increasing financial stability and decreasing banking risk. Research that also uses logZROA as a proxy for stability is Trinugroho et al. (2017) and Tran et al. (2022), which their research also becomes this research reference. The formula for calculating Z-Score ROA is as follows:

$$ZROA_{i,t} = \frac{\left(ROA_{i,t} + EQTA_{i,t}\right)}{SDROA_{i,t}} \dots (3)$$

i : Number of observations
t : Time period
ROA : Net profit divided by total assets
EQTA : Total equity divided by total assets
SDROA : Standard deviation of ROA

Independent variable

This research uses two independent variables, namely market concentration and capital ownership. Market concentration (Concentration) is proxied using the HHI or Herfindahl-Hirschman Index. Then, capital ownership (Capital) is proxied using EQUITY, obtained from total equity divided by total assets, and CAR, obtained from the ratio of total equity divided by total assets. These variables are in line with research by Schaeck and Cihák (2012) and Tran et al. (2022).

Variable control

In this research, there are several control variables. Namely the first is RevDiv, which is a proxy for banking income diversification obtained from calculations between operational and non-operational income (Stiroh, 2006). Next is CIR, or cost-to-income ratio, which is a proxy for efficiency in line with research by Dietrich and Wanzenried (2011). Then is NIM or net interest margin as a proxy for profitability, which is calculated by subtracting net interest income from total interest expenses and then dividing the result by total assets. Next is GDRP (*Gross Domestic Regional Product*), which is a proxy for economic growth and inflation as a proxy for the influence of inflation on banking conditions.

4. Results and discussion

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
logZROA	646	5.945	0.534	3.320	7.656
HI	646	0.231	0.223	0.062	1.000
EQUITY	646	0.178	0.115	0.011	0.849
Rev. Div	646	0.031	0.073	-0.157	0.441
CIR	646	0.703	6.747	-119.611	51.465
NIM	646	0.027	0.035	-0.090	0.192
LogGDRP	646	17.469	2.281	12.866	19.964
Inflation	646	0.170	0.217	-0.386	0.700

Table 1 shows the statistical results of all the variables used in this research. LogZROA, as a proxy for stability, shows an average of 5.945. Next is a proxy for market concentration, namely HHI of 0.231. These results are small, which means that the level of market concentration of BPRS is at a low level. Then is a proxy for capital ownership, namely EQUITY of 0.178. Table 2 is the result of the correlation test of the variables used in this research. When we look at the correlation matrix, we notice that the majority of variables have values below 0.8, except for the relationship between the variables EQUITY and logZROA. This exception points to a strong positive correlation between these two variables, with EQUITY representing bank capital and logZROA reflecting stability.

Table 2. Correlation matrix

	logZROA	HHI	EQUITY	Rev. Div	CIR	NIM	LogGDRP	Inflation
logZROA	1.000							
HHI	0.183	1.000						
EQUITY	0.913	0.185	1.000					
Rev. Div	-0.175	-0.054	-0.096	1.000				
CIR	0.112	0.024	0.037	0.186	1.000			
NIM	0.466	0.105	0.403	-0.154	0.037	1.000		
LogGDRP	-0.254	-0.115	-0.260	-0.058	0.009	-0.179	1.000	
Inflation	0.029	-0.082	0.022	0.010	0.004	0.051	-0.120	1.000

Based on Table 3, the results show that market concentration as proxied by HHI shows insignificant results on stability as proxied by logZROA. Therefore, these results indicate that this study did not obtain results that support both views regarding market concentration, there are *concentration-stability* and *concentration-fragility*. Much of the research, particularly from Fu et al. (2014), Thakor (2014), and Kasman and Kasman (2015) indicates that banks with significant concentration in the banking market often exhibit a tendency to assume higher risks, leading to conditions of instability. In contradiction to those research findings, studies by Tran et al. (2022) and Phan et al. (2019) suggest that an increase in bank concentration is positively related to stability. Therefore, Hypothesis 1 is not accepted because there were no results found that explain the relationship between BPRS concentration and stability in this study.

Table 3. Panel data regression

	(1) logZROA
HHI	0.105
	(0.99)
EQUITY	**3.964*****
	(26.78)
HHI*EQUITY	-0.359
	(-0.91)
Rev. Div	**-0.779*****
	(-6.41)
CIR	**0.00749*****
	(9.72)
NIM	**0.589*****
	(2.77)
LogGDRP	-0.00821
	(-1.26)
Inflation	0.00777
	(0.40)
_cons	**5.374*****
	(42.67)
N	646
N_g	162
r2_w	0.682

t statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Then, the capital ownership variable, which is proxied by EQUITY, has a significant positive relationship with stability, which is proxied by logZROA. These results are in line with research conducted by Tran et al. (2022), Thakor (2014), and Anginer et al. (2018), which then contradicts with research by Oduor et al. (2017), who researched banks in African countries as well as Kasman and Kasman (2015) who researched banks in Türkiye. Furthermore, a study conducted by Lee et al. (2014) also asserts that an increase in market concentration leads to higher capital levels, thereby enhancing stability through risk reduction and increased profitability (NIM). Therefore, Hypothesis 2 is accepted because it aligns with the results of studies by Lee et al. (2014), Tran et al. (2022), Thakor (2014), and Anginer et al. (2018), all of which show a significant positive correlation between BPRS capital and stability.

Next is the income diversification proxy (RevDiv), which gives significant negative results on stability (logZROA), which can be interpreted as meaning that increasing income diversification can influence increased risk-taking in banking. These results are in line with research by De Jonghe (2010), Baek et al. (2018), and Phan et al. (2019).

The efficiency proxy (CIR) provides significant positive results on logZROA, which means that an efficient bank is proxied based on the ratio *cost-to-income ratio* and will be able to control the level of risk better and can increase banking stability. Then, the proxies for the influence of economic growth (LogGDRP) and inflation (Inflation) provide insignificant results on stability, which proves that increasing economic growth and inflation have no effect on stability.

For further testing, this research also carried out a *robustness test*, as seen in Table 4. In the robust test results presented, there are no significant differences in results between the two models, *random effect* and *fixed effect*, from which it can be concluded that the results that have been carried out are in line with the results of the regression tests that have been carried out.

Table 4. Robustness test

	RE	FE
	(1)	(2)
	logZROA	logZROA
HHI	0.105	-0.277
	(0.65)	(-0.48)
EQUITY	**3.964*****	**3.799*****
	(7.62)	**(5.35)**
HHI*EQUITY	-0.359	-0.437
	(-0.55)	(-0.49)
Rev. Div	**-0.779****	**-0.791****
	(-2.32)	**(-2.29)**
CIR	**0.00749*****	**0.00766*****
	(4.03)	**(4.17)**
NIM	**0.589****	0.343
	(2.12)	(1.39)
LogGDRP	-0.00821	**-0.322*****
	(-1.00)	**(-2.77)**
Inflation	0.00777	0.0112
	(0.38)	(0.57)
_cons	**5.374*****	**10.99*****
	(26.58)	**(5.22)**
N	646	646
N_g	162	162
r2_w	0.682	0.686

t statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5. Conclusion

The findings in this research provide valuable insight into the dynamics of Islamic Community Banks (BPRS) in Indonesia, especially in the context of bank concentration, capital, and stability. This research has identified several key findings that have profound implications for banking practitioners and regulators in the country.

First, this research highlights that market concentration, especially when implemented by BPRS, can result in a decrease in the level of bank stability. This illustrates the importance of diversity in the market segments served by SRBs. Too strong a focus on one particular segment, such as MSMEs, can increase risks when that segment is affected by economic or market changes. Second, increasing capital ownership in BPRS has been proven to be a significant step in increasing bank stability. This indicates the importance of ensuring that BPRS has adequate capital resources to face challenges that may arise. Increasing capital can be an effective strategy to reduce risk and increase the resilience of BPRS to economic shocks.

This research encourages banking practitioners to consider diversifying their market segments. Apart from supporting MSMEs, BPRS can also explore opportunities in other market segments to mitigate risks associated with concentration. Meanwhile, obtaining additional capital must be a major consideration in BPRS business planning. On the regulatory side, the results of this research raise important questions about policies related to market concentration. Regulators need to consider their role in encouraging BPRS to develop their market segments more evenly.

Policies that support diversification and capital development may need to be considered to strengthen the stability of the SRB sector. Overall, this research provides a basis for a better understanding of the factors influencing the stability of BPRS in Indonesia and provides a basis for strategic improvements in dealing with risks related to concentration and capital. In addition, these findings can guide regulators in developing more effective policies for the Islamic banking sector in the country.

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