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# Article

# Islamic bank margins in Indonesia: The role of market power and bank-specific variables

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# **BANKING & FINANCE | RESEARCH ARTICLE**

# Islamic bank margins in Indonesia: The role of market power and bank-specific variables

Agus Widarjono<sup>1</sup>\*, Priyonggo Suseno<sup>2</sup>, Devi Utami Rika Safitri<sup>2</sup>, Atif Yaseen<sup>2</sup>, Kurniawan Azra<sup>2</sup> and Irma Nur Hidayah<sup>2</sup>

**Abstract:** Our study examines the determinants of bank margins in Indonesian Islamic banks. The determinants of bank margins consist of market-and-bank-specific variables. We investigate 31 banks, using quarterly data from 2015: Q1 to 2020: Q4. Panel regression with unbalanced data is employed. The findings indicate that higher Islamic bank margins are positively linked to banks with higher market power. Bank with high risk-sharing financing has low bank margins. Bank-specific variables such as income diversification, risk-averse, financing, and financing risk influence bank margins. This study also documents that the effect of market power on Islamic bank margins is more pronounced in Islamic bank subsidiaries, and lower

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# PUBLIC INTEREST STATEMENT

The Islamic banking market in Indonesia is an imperfect competition market. More interestingly, risk-sharing financing is relatively large in Indonesia compared to other countries. This study examines the effect of market forces and risk-sharing financing together with some bankspecific variables on Islamic bank margins in Indonesia. The results show that market power has a strong influence on bank margins. Risksharing financing reduces bank margins and, in turn, it may lower the intermediation costs of Islamic banks.

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© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent. bank margins through risk-sharing financing are more prominent in Islamic bank subsidiaries. These results suggest important policy implications that Islamic banks should focus on risk-sharing financing as a core business of Islamic banks because it can reduce the price of Islamic bank financing products as well as their intermediation costs.

### Subjects: Economics; Finance; Business, Management and Accounting

Keywords: Market power; risk-sharing financing; Islamic bank margins; Indonesia

JEL classification: G21; G32

#### 1. Introduction

Practicing Islamic banks in Indonesia, a majority Muslim country in the world, started in the 1990s. Islamic banks grew up fast after the law of Islamic banking no. 23 of 2008 was enacted (Widarjono et al., 2022a). Islamic banks in Indonesia consist of large Islamic banks (33 banks) and small Islamic banks (165 banks). The large Islamic banks comprise 13 full-fledged Islamic banks and 20 Islamic bank subsidiaries. The market of Islamic banks, though, is imperfect competition in Indonesia. The concentration ratio of the four largest banks (CR-4) during 2017–2020 was 51.05%, 49.68%, 48.83%, and 48.83%, respectively. Accordingly, the Indonesian Islamic bank is obviously close to an oligopoly.

The relative market power and structure conduct performance are two basic theories that discuss the effect of market structure on banking performance. Several studies indicated that probability is strongly affected by relative market power, such as Fu and Heffernan (2009), Mirzaei et al. (2013), and Hamid (2017). Other studies support the structure conduct performance in determining profitability, such as M. Nguyen et al. (2012) and H. H. Khan et al. (2018). Furthermore, market power also affects the margins of conventional banks such as Entrop et al. (2015), Agoraki and Kouretas (2019), and T. V. H. Nguyen and Nguyen (2022).

Banking margins in Indonesia are quite high among Asian countries, so conventional banks benefit from these highest margins. More interestingly, Indonesian bank margins were even higher after the 1997–1998 financial crisis (Trinugroho et al., 2014). With the dual banking environment in Indonesia, the high conventional bank margins will affect Islamic bank margins. Shaban et al. (2014) documented that Islamic banks overcharge their prices, indicated by lower capital and high bank margins contrasted to their conventional banks. This condition may occur since the majority of their customers are small and medium firms that are quite impenetrable and financially restrained. Hence, they may charge a high premium price for their customers, and, as a result, Islamic banks barely compete with their conventional counterpart banks.

Some studies have examined the effect of market power together with some bank-specific variables on bank margins. Most studies on bank margins are related to conventional banks, such as Entrop et al. (2015), Birchwood et al. (2017), Agoraki and Kouretas (2019), Cruz-García and Fernández de Guevara (2020), and T. V. H. Nguyen and Nguyen (2022). Research on the influence of market power on bank margins also is carried out for Islamic banks (F. N. H. T. Khan et al., 2021; Sun et al., 2017). Those empirical studies indicated that bank margins are positively influenced by market power for conventional banks and Islamic banks.

We examine the impact of market power along with several bank-specific variables on Islamic bank margins in Indonesia. This research contributes to existing studies in the following ways. First, studies on the influence of market power on Islamic bank margins are still rare. Second, this study also includes risk-sharing financing contracts such as Mudharaba and Musyaraka as the main core business of Islamic banks in influencing Islamic bank margins. Risk-sharing financing has not become a preference for Islamic banks in many countries due to risky financing. Indeed, Risksharing financing in Indonesian Islamic banking is relatively large compared to other countries (Abedifar et al., 2013). The existing studies haven't addressed this issue to the best of our knowledge. Third, this study also distinguishes the behavior of determining bank margins between fullfledged Islamic banks and Islamic bank subsidiaries.

#### 2. Literature review

Banking literature has built a variety of models to explain bank interest margins as a financial intermediary. Ho and Saunders (1981) were the pioneers who developed a theoretical framework for determining bank interest margins. They offered a model through the dealership model, which proposes the bank as a risk-averse intermediary between creditors and debtors. The model proposes several factors that affect the net interest margins, consisting of (1) market power, (2) the level of risk aversion, (3) the average size of bank operations, (4) and market interest rate volatility.

Several studies then extended the basic model of dealership theory. Zarruk and Madura (1992) developed a bank model that integrates capital regulation and deposit insurance premiums. Angbazo (1997) combines interest rate risk and credit risk and the interaction between two variables on bank margins. Saunders and Schumacher (2000) break down the bank margins into a market structure, regulatory, and risk premium component. Maudos and Fernández de Guevara (2004) consider the average operating costs as a basis of net interest income. Carbó Valverde and Rodríguez Fernández (2007) expand the theoretical banking model by incorporating traditional and nontraditional activities. Maturity transformation is also a determinant of bank margins (Entrop et al. (2015) and Birchwood et al. (2017) incorporate bank regulations.

The influence of market power on bank margins has been widely carried out in conventional banking. Among them are Lin et al. (2012), Trinugroho et al. (2014), Entrop et al. (2015), Birchwood et al. (2017), Agoraki and Kouretas (2019), Cruz-García and Fernández de Guevara (2020) and T. V. H. Nguyen and Nguyen (2022). The findings show that market power, as widely measured by the Lerner index, has a positive effect on bank margins. Banks with higher market power can set a high price and accordingly generate high margins.

The literature on Islamic bank margins is scarcely available. The empirical literature on Islamic Bank Margins (IBM) can be tracked by Hutapea and Kasri (2010). The results show that capital, cost, cost-to-income ratio, financing risk, and bank reserves have a positive impact on IBM. Meanwhile, liquidity risk and interest rates negatively affect IBM. Lee and Isa (2017) investigated the Islamic bank margins in Malaysia with a dual banking environment. The bank margins are associated with market share, operational efficiency, operating costs, financing risk, and implicit interest payments. Salleh et al. (2018) explored the bank margins in Islamic bank subsidiaries in Malaysia. Bank size, operating costs, and risk have a positive impact on bank margins, but the imperfect market, financing risk, and economic growth negatively influence bank margins.

Sun et al. (2017) examined Islamic bank margins in 15 Islamic countries. The findings show that market power measured by the Lerner Index positively affects bank margins, but all control variables do not affect bank margins. The study by Bougatef and Korbi (2018) documented that bank margins are linked to inefficiency, degree of risk aversion, income diversification, and macro-economic condition for Islamic banks in the MENA. Of specific concern was conducted by F. N. H. T. Khan et al. (2021), who investigated Islamic bank margins by examining the role of bank regulations in ASEAN countries. The regulatory framework and Shariah supervisory board negatively affect bank margins, implying that policymakers should enact separate regulatory frameworks for bank managers and Islamic banks to reduce bank margins. The Lerner index is the only bank-specific variable positively affecting Islamic bank margins.

Trinugroho et al. (2018) examined the small Islamic bank margins in Indonesia. They found that competition and diversification are the main factors in determining bank margins. High margins

can be generated when the small Islamic banks market is a less competitive market. Islamic banks also generate high margins as their income is less diversified, suggesting a strategy of cross-subsidization. More importantly, market power generates a high margin for Islamic banks with high-risk-sharing financing since this type of financing is risky financing. The bank sets higher margins to compensate for this high risk. Yet, those effects weaken as Islamic banks are in regions predominantly Muslim. Indeed, the role of trust in financing judgment reduces the margins of small banks in the case of the Murabaha contract (Fatwa & Moro, 2022).

Several studies also investigated the determination of bank margins in the dual banking system where conventional banks and Islamic banks operate together. Ibrahim and Law (2019), using data on conventional and Islamic banks in Malaysia, documented that Islamic banks' margins are higher compared to conventional banks. Further, the difference in bank margins between the two banks is influenced by market power, diversification, and operating costs. Khattak et al. (2021) examine the size of the bank margin using a panel quantile regression in the cases of 14 countries that apply a dual banking system. The results indicate that banks with higher market power can generate higher margins. However, using the Islamic interaction dummy, the effect of market power on Islamic banks' margins is found only for higher quantiles. These findings suggest that Islamic banks should be more competitive and efficient to earn higher margins.

## 3. Hypothesis

Commonly, empirical studies examining bank margins consist of market power and some bankspecific factors such as bank size, bank capital, liquidity, diversification strategy, operating cost, and loan risk (Bougatef & Korbi, 2018; Khattak et al., 2021; Sun et al., 2017; Trinugroho et al., 2018).

### 3.1. Market power and Islamic bank margins

Bank Margins are evidently associated with the role of market power of the bank (Agoraki & Kouretas, 2019; Cruz-García & Fernández de Guevara, 2020). Market power is widely measured by the Lerner index. An imperfect market is indicated by a high Lerner index, and by contrast, a low Lerner index represents perfect market competition. A High Lerner index implies that Islamic banks can set premium prices over their cost to get a high margin (T. V. H. Nguyen & Nguyen, 2022).

H1: Lerner Index (Lerner) has a positive effect on bank margins

### 3.2. Risk-sharing financing and Islamic bank margins

The principal distinction between Islamic and conventional banks are the existence of risk-sharing contracts as the core business of Islamic bank, consisting of Mudharaba and Musyaraka contracts. The Islamic banks disburse the risk-sharing contracts to diversify financing. Risk-sharing financing is generally not attractive to Islamic banks because it generates high financing risk (Sutrisno & Widarjono, 2022). Due to the high financing risk from risk-sharing financing, the price of the Mudharaba and Musyaraka contracts is relatively high to compensate for the high risk of those financing. Therefore, Islamic banks set high margins from risk-sharing financing (Trinugroho et al., 2018). Though the impact of risk-sharing financing is inverted U-shaped on non-performing Financing, so risk-sharing financing can lower NPF after reaching its maximum level (Warninda et al., 2019). Hence, Islamic banks can determine low margins from risk-sharing financing.

H<sub>2</sub>: Risk-sharing financing influences bank margins.

### 3.3. Income diversification and Islamic bank margins

Bank incomes are from financing activities and non-financing activities. Income diversification shows variations in net operating income from both financing and non-financing activities. More diversified income causes banks to determine low margins, and more concentrated income encourages banks to set high margins (Lee & Isa, 2017).

H<sub>3</sub>: Income diversification negatively influences bank margins.

#### 3.4. Bank size and Islamic bank margins

Total assets correspond to the size of the Islamic bank. Islamic bank with larger assets get an advantage due to economies of scale and turn, has lower operating efficiency so they can set up low margins (Ibrahim et al., 2017). Yet, diseconomies of scale and inefficiency may result in larger Islamic banks due to mismanagement in financing (Pasiouras & Kosmidou, 2007). As a result, Islamic banks must set up high margins to offset this mismanagement.

H4: Bank size affects bank margins.

#### 3.5. Risk aversion and Islamic bank margins

Banks are assumed to have risk-averse behavior. The degree of risk aversion also influences bank margins (Trinugroho et al., 2014)l. The degree of risk aversion is widely measured using the capital asset ratio (CAR) (Hamid, 2017). CAR indicates banks' ability to preserve their capital capability. The high degrees of risk aversion are indicated by high CAR. Banks with higher margins are likely related to banks with a higher degree of risk aversion since the banks need a risk premium (Lepetit et al., 2008).

H<sub>5</sub>: Risk aversion positively affects bank margins.

#### 3.6. Financing and Islamic bank margins

The main orientation of traditional banking activities is to disburse loans for conventional banks or financing for Islamic banks. The size of the financing can have two impacts on bank margins. Banks oriented toward their traditional activities with high financing generate higher margins (Lin et al., 2012). Conversely, high financing indicates that banks do not carry out income diversification strategies, giving rise to higher idiosyncratic risk (Baele et al., 2007). To attract customers, banks then reduce the prices of their products so that bank margins are low.

H<sub>6</sub>: Financing influences bank margins.

### 3.7. Efficiency and Islamic bank margins

The cost-to-income ratio (CIR) is widely utilized to measure bank efficiency. CIR indicates how much it costs to generate income. The bank with high CIR points out that the cost to generate per unit income is high. Hence, high CIR denotes low operating efficiency, and low CIR indicates high operating efficiency (Bougatef & Korbi, 2018). Higher efficiency is closely related to low CIR and is linked to high bank margins.

H<sub>7</sub>: Inefficiency positively influences bank margins.

#### 3.8. Financing risk and Islamic bank margins

This study also includes financing risk measured by non-performing financing (NPF) as one factor which determines bank margins following the existing studies (Chortareas et al., 2012). The ratio of non-performing financing to total financing is a proxy of the financing risk of Islamic banks. Islamic banks with higher financing risk set a higher premium from their clients (Maudos & Fernández de Guevara, 2004). In contrast, because of riskier Islamic banks with high financing risk, depositors need high Islamic financing returns from their money, leading to these banks generating lower bank margins (Fungacova & Poghosyan, 2011).

H<sub>8</sub>: Non-performing financing influences bank margins.

#### 4. Methodology

#### 4.1. Data

Our study covers 13 full-fledged Islamic banks and 18 Islamic bank subsidiaries, so the total number of Islamic banks under this study is 31 Islamic banks. The observation period is six years, spanning from 2015 to 2020, and using quarterly data. The total panel data are 664 observations with unbalanced panel data. All bank-data level is extracted from the Indonesian Financial Services Authority (IFSA), which are available online (www.ojk.go.id). The IFSA provides all financial reports on a quarterly basis, such as balance sheets and income statements for all full-fledged Islamic banks as well as Islamic bank subsidiaries.

#### 4.2. Empirical Method

Our study utilizes static panel regression to empirically examine the effect of market power and bank-specific variable on Islamic bank margins in Indonesia. The static panel regression specification is:

$$\begin{split} \text{Margins}_{it} &= \delta_0 + \delta_1 \text{ALerner}_{it} + \delta_2 \text{Rsfin}_{it} + \delta_3 \text{Incdiv}_{it} + \delta_4 \text{Lasset}_{it} + \delta_5 \text{CAR}_{it} + \delta_6 \text{Fin}_{it} + \delta_7 \text{CIR}_{it} \\ &+ \delta_8 \text{NPF}_{it} + e_{it} \end{split} \tag{1}$$

Where Margins are Islamic bank margins, ALerner is the adjusted Lerner index to assess Islamic bank's market power, Rsfin is risk-sharing financing, and some bank-specific variables, consisting of income diversification (Incdiv), bank size (asset), degree of risk aversion (CAR), financing (Fin), operating efficiency (CIR), and financing risk (NPF). The asset is expressed in terms of the natural logarithm.

The Islamic bank margins, our dependent variable, are calculated using two measurements. First, it is the net income divided by total financing (Trinugroho et al., 2018). Second, it is net income divided by the total asset (Lee & Isa, 2017). Net income is income from financing minus profit-sharing for owners of investment funds (Hutapea & Kasri, 2010).

Our study measures market power using the adjusted Lerner index. The adjusted Lerner index is also associated with banks' power in determining their price, which is similar to the standard Lerner index. High market power is indicated by high adjusted Lerner index. The standard Lerner index is restricted because of the assumption of given cost efficiency and profit, implying that it does not represent real market power (H. H. Khan et al., 2017). By contrast, because of market power, the adjusted Lerner index proposes that banks may likely fail to capitalize on price opportunities, while the standard Lerner index considers full efficiency (Koetter et al., 2012). Accordingly, the adjusted Lerner index is superior to the standard Lerner index (Tan & Floros, 2018). The Adjusted Lerner is calculated as (Kasman & Kasman, 2015; Tan & Floros, 2018):

$$ALerner = \left[\frac{\text{Net Income + Total Cost} - (\text{Marginal cost} * \text{Total Earning Asset})}{\text{Net Income + Total Cost}}\right]$$
(2)

The marginal cost (MC) is derived translog cost function with two inputs (Maudos & Solís, 2009; Risfandy et al., 2020):

$$\begin{aligned} \mathsf{TC}_{it} &= \emptyset_0 + \sum_{k=1}^2 \emptyset_1 \mathsf{LnV}_{k,it} + 0.5 \sum_{k=1}^2 \sum_{l=1}^2 \rho_{kl} \mathsf{LnV}_{k,it} \mathsf{LnV}_{l,it} + \rho_1 \mathsf{LnAsset}_{it} + 0.5 \delta_2 (\mathsf{LnAsset}_{it})^2 \\ &+ \sum_{k=1}^2 \rho_{2k} \mathsf{LnAsset}_{it} \mathsf{LnV}_{k,it} + \varepsilon_{it} \end{aligned}$$
(3)

TC is the total cost, consisting of profit-sharing expenses and other operating costs. V1 denotes the ratio of profit-sharing expense to total customer deposits (current account, saving, and deposit). V2 shows the ratio of other operating costs to total fixed assets. Ln represents the natural logarithm. Deriving eq. (4) with respect to asset results in MC as

$$MC_{it} = \left(\rho_1 + \rho_2 LnAsset_{it} + \sum_{k=1}^{2} \rho_{2k} LnV_{k,it}\right) \frac{TC_{it}}{LnAsset_{it}}$$
(4)

Risk-sharing financing is risk-sharing financing divided by the total asset. Islamic bank incomes are from both financing and non-financing activities instead of interest rate. Income diversification is measured by income from non-financing activities. Following Entrop et al. (2015), income diversification (Incdiv) is measured as

$$Incdiv = 1 - \left[ \left( \frac{Fin}{Tfin} \right)^2 + \left( \frac{Nfin}{Tfin} \right)^2 \right]$$
(5)

Tfin, Fin, and Nfin represent total income, financing income, and non-financing income, respectively. As bank income is concentrated on only financing income as a single source, then the value of income diversification is 0. However, as bank income is evenly split between net financing and non-financing income, the value is 0.5, meaning that a higher value indicates higher income diversification.

Islamic bank size is measured by the total asset. The degree of risk aversion is calculated using the capital adequacy ratio (CAR). Islamic bank financing is computed by the financing-to-total deposit ratio (FDR). Operating efficiency is determined by the cost-to-income ratio (CIR), and the ratio of financing default to total financing is a proxy of financing risk. Table 1 represents the definition of all variables, both dependent variables and explanatory variables, and the data source.

Islamic bank margins can be estimated by either the static panel regression or the dynamic panel method. We opt for the static panel method. The key reason is our panel data set does not suit the dynamic panel model. The dynamic panel model will generate a consistency estimator if it is estimated using the generalized method of moment (GMM). However, the GMM method needs panel data with large observation (N) and small time series (T). Our sample consists of 31 banks. Therefore, the dynamic panel with GMM could produce a biased estimation in our study since the number of observations is small, less than 40 (Al-Muharrami & Murthy, 2016; Ibrahim & Law, 2019). Furthermore, the GMM method leads to a loss of observations since the dynamic panel data requires instrument variables using the first differencing and lagged variables (Ibrahim & Law, 2019). We follow the previous study using the static method in estimating Islamic bank margins due to a small number of observations such as Al-Muharrami and Murthy (2016), Trinugroho et al. (2018), Salleh et al. (2018), Ibrahim and Law (2019), and F. N. H. T. Khan et al. (2021). Three estimation methods are commonly applied for estimating static panels, encompassing pooled least squares, fixed effect (FE), and random effect (FE). The F-statistic is used to check between pooled least squares and fixed effect, the Breusch-Pagan statistic is employed to test pooled least squares and random effect, and finally, the Hausman test is utilized to check between fixed effect and random effect.

### 5. Results and discussion

### 5.1. Descriptive statistics

Table 2 reveals the descriptive statistics of all variables. Margin 1 and margin 2, on average, were 0.0456 and 0.035, respectively. The average ALerner and Lerner index were 0.4577 and 0.264, with a high standard deviation, implying that the price offered by Islamic banks was 45.77% and 26.4% above the cost. On average, the ratio of risk-sharing financings to the total asset was 0.2915,00, much lower than non-risk-sharing financing. Several Islamic banks do not disburse risk-sharing financing due to higher financing risk than conventional banks (Widarjono et al., 2022b).

The average assets were IDR 14.4 trillion with a high variation due to high standard deviation, indicating that the bank's size varies, but one bank dominates the market with a market share of 22.664% (IDR 127 trillion). Income diversification on average was 0.2626. The average CAR was 21.39% and exceeded the threshold of 15% required by the IFSA. The average financing (Fin) was 100.95%, indicating that the expansive strategy of Islamic banks is persistent due to the newest player in the banking system. Yet, this expansive strategy is manageable because this financing rate is between 85%-110%, the threshold value set by IFSA. The average operating efficiency (CIR)

Table 1. Variable definition and data source						
Variable	Definition	Data source				
Dependent						
Margin 1 Margin 2	Net income-to-total financing ratio Net income-to-total asset ratio	IFSA				
Independent						
Market-specific variable						
Adjusted Lerner Index	Efficiency-adjusted Lerner index	IFSA				
Lerner Index	Standard Lerner index	IFSA				
Bank-specific variable						
Rsfin	Ratio of risk-sharing financing to the total asset	IFSA				
Income Diversification (Incdiv)	A variation of net income from financing and non-financing activities	IFSA				
Asset	Asset (IDR billion).	IFSA				
CAR	The equity-to-total asset ratio	IFSA				
Fin	The financing-to-the total deposit ratio	IFSA				
CIR	The cost-to-income ratio	IFSA				
NPF	The financing defaults-to-total financing ratio	IFSA				

was 85.51% which is under the maximum value of 95%. The average financing default (NPF) was 3.75%, below the maximum upper limit of 5%, indicating that Islamic banks face low financing risk.

This study also describes some key financial performances of Indonesian Islamic banks during the observation period, 2015 to 2022, using monthly data. As a country with a majority Muslim population, Indonesia started with an Islamic bank in 1992 when Bank Muamalat Indonesia began their business using a profit loss-and-sharing scheme following Law Number 7 of 1992. Finally, the government enacted the Islamic Banking Law No. 21 of 2008. Islamic Banking in Indonesia consists of Islamic commercial banks (large banks) and Islamic rural banks (small banks). Indonesian Islamic banking has grown rapidly since 2008 in terms of assets as well as the number of banks (Widarjono et al., 2023). Islamic commercial banks are 33 banks, consisting of 12 full-

Table 2. Descriptive statistics							
Variable	Obs.	Mean	Std. Dev.	Min	Max		
Margin1	664	0.0456	0.0490	0.0019	0.4204		
Margin2	664	0.0354	0.0364	0.0019	0.3263		
Alerner	664	0.4577	0.7702	-9.9685	1.9619		
Lerner	664	0.2698	0.6456	-2.0828	2.3984		
Rsfin	664	0.2915	0.2164	0.0000	0.8643		
Incdiv	664	0.2626	0.1408	0.0011	0.5000		
Asset	664	14.4000	20.6000	0.4989	127.0000		
CAR	664	0.2123	0.0645	0.1016	0.8865		
Fin	664	1.0095	0.3171	0.0047	3.3852		
CIR	664	0.8551	0.1395	0.1684	2.1740		
NPF	664	0.0377	0.0366	0.0002	0.2229		

fledged Islamic banks and 21 Islamic bank windows, and Islamic rural banks are 164 banks in 2022. Figure 1 shows the trend profitability and financing risk of Islamic banks. The figure clearly indicates a positive trend in profitability (ROA) and a negative trend in financing risk (NPF). These findings indicate that Islamic banks can improve their performance and reduce financing risk because they are more experienced in managing their business. However, the Islamic bank market is imperfect competition. The CR-4 of Islamic banking was 48.85% in 2022. Even though bank Syariah Indonesia and Bank Muamalat Indonesia are two dominant banks in Indonesian Islamic banks in terms of size.

Before estimating panel regression, our study initially checks the correlation among variables to guarantee no multicollinearity problem. Table 3 shows the coefficient of correlation. The highest correlation between the Alerner and Lerner (0.66). Nevertheless, this is nothing to worry about because the two independent variables are used separately in the regression. Mostly, the coefficients of correlation are less than 0.5, indicating that coefficients of correlation guarantee no evidence of multicollinearity and, accordingly, generate efficient estimators.

#### 5.2. Baseline regression

Table 4 reveals findings utilizing the static panel model. As mentioned before, this study measures Islamic bank margins using two measurements, namely margin 1 (model 1) and margin 2 (model 2). F-test indicates that the appropriate method is the fixed effect. Then, the next step is testing between Fixed effect and Random effect using the Hausman test. According to the Hausman test, the null hypothesis of the random effects is not rejected, so the applicable panel model is a random effect for model 1 as well as model 2 instead of a fixed effect.

Table 4 presents the baseline regression. As predicted, the adjusted Lerner index, which represents the degree of market power, is positively linked to Islamic bank margins in Indonesia. The coefficients of market power are significant across the different measurements of bank margins. The findings strongly indicate that Islamic banks with high market power have a strong capability to determine high margins. This could be the case since the Islamic bank market in Indonesia is an imperfect competition market, close to an oligopoly (Widarjono et al., 2020). Islamic banks can capitalize on their monopoly power by charging high margins due to the inelastic supply and demand in the Islamic banking market, according to the dealership theory (Trinugroho et al., 2014). These results reinforce the empirical literature such as Lin et al. (2012), Cruz-García and Fernández de Guevara (2020), T. V. H. Nguyen and Nguyen (2022) for conventional banks as well as Sun et al. (2017) and F. N. H. T. Khan et al. (2021) for Islamic banks.





Table 3. Corre	elation matrix									
	Margin 1	Margin2	Alerner	Lerner	Rsfin	Incdiv	Lasset	CAR	Fin	CIR
Margin1	1.00									
Margin2	0.95	1.00								
Alerner	0.19	0.13	1.00							
Lerner	0.16	0.10	0.66	1.00						
Rsfin	-0.31	-0.28	0.00	-0.01	1.00					
Incdiv	-0.35	-0.34	-0.07	-0.04	0.30	1.00				
Lasset	-0.13	-0.04	-0.03	0.09	0.15	0.09	1.00			
CAR	0.32	0.28	0.04	0.04	-0.12	-0.17	-0.21	1.00		
Fin	0.13	0.13	0.03	-0.01	0.07	-0.17	-0.35	0.12	1.00	
CIR	-0.30	-0.23	-0.11	0.04	0.20	0.25	0.29	-0.38	-0.16	1.00
NPF	-0.18	-0.14	-0.03	-0.05	0.02	0.16	-0.03	-0.27	-0.04	0.34

Risk-sharing financing, measured by the ratio of risk-sharing financing to total assets, negatively affects Islamic bank margins. Indeed, both models give strong evidence that this coefficient is significant across the different measurements of bank margins. These findings imply that banks with a higher proportion of risk-sharing financing can reduce bank margins. The proportion of Musyaraka financing is high in Indonesian Islamic banks. Evidence highlights that the impact of Musyaraka financing on financing risk is a reverse U-shape, meaning that a high proportion of risk-sharing financing reduces financing risk (Warninda et al., 2019). Due to the basic features of Musharaka financing, Islamic banks can share control and risk of their financing activities. Islamic banks with strict monitoring may reduce agency problems and decrease earnings management behavior (Ahn & Choi, 2009). In addition, the price of Musyaraka financing in Indonesia is low compared to the lending rate of conventional banks. Consequently, risk-sharing financing can mitigate the high financing risk of Islamic banks (Ahmed, 2010; Alqahtani & Mayes, 2018; Hasan & Dridi, 2011).

Variable	Model 1: Margin 1		Model 2: Margin 2	
	FE	RE	FE	RE
Market-specific variables				
Alerner	0.0047***	0.0052***	0.0031**	0.0032**
	(0.0019)	(0.0019)	(0.0015)	(0.0014)
Bank-specific variables				
Rsfin	-0.0540***	-0.0500***	-0.0090	-0.0190*
	(0.0191)	(0.0152)	(0.0144)	(0.0116)
Incdiv	-0.0293**	-0.0349***	-0.0165*	-0.0218**
	(0.0135)	(0.0131)	(0.0102)	(0.0099)
Lasset	0.0099**	0.0037	0.0037	0.0025
	(0.0046)	(0.0032)	(0.0035)	(0.0024)
CAR	0.0602**	0.0849***	0.0046	0.0196
	(0.0338	(0.0315)	(0.0255)	(0.0238)
Fin	0.0137**	0.0126**	0.0141***	0.0144***
	(0.0060)	(0.0058)	(0.0045)	(0.0044)
CIR	0.0169	0.0125	0.0092	0.0062
	(0.0157)	(0.0151)	(0.0118)	(0.0114)
NPF	-0.0936*	-0.1055**	-0.0521	-0.0630*
	(0.0677	(0.0632)	(0.0511)	(0.0479)
Cons	-0.1262	-0.0280	-0.0375	-0.0164
	(0.0694	(0.0501)	(0.0524)	(0.0385)
N. Obs	664	664	664	664
N. Banks	31	31	31	31
R-sq within	0.0452	-	0.0321	-
R-sq overall	-	0.2208	-	0.1679
Diagnostic test				
F test	16.9100***		18.47***	
LM test	1107.1600***		1240.56***	
Hausman test	13.7600		12.28	

Note: \*, \*\*, and \*\*\* reject the null hypothesis at 10%, 5%, and 1%. Parentheses show the standard error.

Table 5. Full-fledged Islamic banks and Islamic bank subsidiaries				
	Full-fledged	Islamic banks	Islamic bank s	subsidiaries
	FE	RE	FE	RE
Market-specific variables				
Alerner	0.0038**	0.0056***	0.0061	0.0086*
	(0.0019)	(0.0020)	(0.0066)	(0.0053)
Bank-specific variables				
Rsfin	-0.0550	-0.0984***	-0.0481**	-0.0182*
	(0.0437)	(0.0245)	(0.0237)	(0.0139)
Incdiv	-0.0350**	-0.0728***	-0.0155	-0.0150
	(0.0191)	(0.0188)	(0.0210)	(0.0178)
Lasset	0.0221**	0.0028	0.0112*	-0.0041
	(0.0105)	(0.0045)	(0.0072)	(0.0032)
CAR	0.0711*	0.1526***	0.0363	0.0363
	(0.0487)	(0.0393)	(0.0537)	(0.0479)
Fin	0.0217	0.0345**	0.0120**	0.0107**
	(0.0201)	(0.0180)	(0.0071)	(0.0061)
CIR	0.0177	0.0017	0.0206	0.0267
	(0.0189)	(0.0200)	(0.0298)	(0.0259)
NPF	-0.0641	-0.1001	-0.1215	-0.1060*
	(0.0825)	(0.0830)	(0.1226)	(0.0739)
Cons	-0.3454**	-0.0194	-0.1387	0.0778
	(0.1734)	(0.0851)	(0.1057)	(0.0477)
No. Obs	294	294	370	370
No. Banks	13	13	19	19
R-sq within	0.0725	-	0.0335	-
R-sq overall	-	0.5096	-	0.1009
Diagnostic test				
F-test	24.11***		2.85***	
LM-test	424.02***		10.49***	
Hausman test	54.92***		13.76	

Note: \*, \*\*, and \*\*\* reject the null hypothesis at 10%, 5%, and 1%. Parentheses show the standard error.

Income diversification (Incdiv) negatively influences Islamic bank margins. This coefficient is significant across the different models, implying that the income diversification strategy steadily lower Islamic bank margins. According to the cross-subsidization strategy, Islamic banks with more diversified income generate lower margins because diversified banks can achieve high income from their nontraditional activities, mostly from non-financing activities (Trinugroho et al., 2014). Accordingly, diversified Islamic banks can charge a low price for their traditional products to maintain customers, even to attract new customers (Maudos & Solís, 2009). Our finding supports the previous study of Trinugroho et al. (2018).

CAR, which represents the degree of risk aversion, has a positive effect on Islamic bank margins in model 1. This expected result holds since Islamic banks with higher risk aversion set a higher price to their customer because depositors certainly need high earnings for their money placed in the banks. Moreover, the banks redeem for their risk-taking behavior where the banks charge the price to their customers. Our findings clearly support the existing empirical literature, such as Kumari 2014 for conventional banks and Sun et al. (2017), and Salleh et al. (2018) for Islamic banks.

The financing deposit ratio positively affects Islamic bank margins in both models, indicating that Islamic banks still participate in traditional activities by focusing on financing and borrowing. Consequently, banks with high financing can earn higher margins. This is the case since Islamic banks have limited financing activities. Islamic banks may not focus on non-financing activities because Islamic banks already have standard products that are in accordance with sharia compliance, and every new product, including non-financing activities, must need approval from the Sharia Supervisory Board (Meslier et al., 2020). Our finding is consistent with the study of Lee and Isa (2017) in Malaysian Islamic banks.

Islamic bank margins are strongly influenced by financing risk. NFP negatively influences margins in both models, meaning that higher NFP reduces bank margins. With higher financing risk, Islamic banks charge a higher premium (Maudos & Fernández de Guevara, 2004). Islamic banks face risky financing from risk-sharing financing activities. These risk-sharing contracts lead to higher non-performance financing (Azmat et al., 2015). Evidence shows that Islamic banks in Indonesia have more financing defaults compared to their counterpart conventional banks (Sutrisno & Widarjono, 2022).

We find that asset and operating efficiency do not strongly affect Islamic bank margins in Indonesia. Total asset is a positive sign and statistically significant only in the Fixed effect model in model 1. CIR is positive and not statistically significant for models 1 and 2. Our finding is consistent with the research conducted by Trinugroho et al. (2018) for small Islamic banks in Indonesia

### 5.3. Further analysis

Islamic banks in Indonesia consist of full-fledged Islamic banks and Islamic bank subsidiaries. Islamic bank subsidiaries are conventional banks that open Islamic businesses. The management of the two banks is different, so their behavior in determining margins may likely be different. In addition, based on assets, full-fledged Islamic banks dominate the Islamic banking market in Indonesia. Therefore, it is interesting to analyze the effect of competition and risk-sharing financing along some specific bank variables on the Islamic bank margins of these two types of banks.

Table 5 presents the results of Islamic bank margins by types of banks. The best model for fullfledged Islamic banks is the fixed effect, and Islamic bank subsidiaries are more pronounced for the random effect model. The Market power positively affects bank margins, but the Lerner coefficient is larger for Islamic bank subsidiaries compared to full-fledged Islamic banks. Risksharing financing also has a negative effect on bank margins for Islamic bank subsidiaries. Income diversification negatively influences bank margins in the case of full-fledged Islamic banks. Bank margins are positively associated with bank size for full-fledged Islamic banks. CAR positively influences bank margins only for full-fledged Islamic banks. The financing deposit ratio positively affects bank margins for Islamic bank subsidiaries, indicating that both Islamic banks focus on traditional financing activities. However, full-fledged Islamic banks are more concentrated on financing activities than Islamic bank subsidiaries. NFP negatively influences bank margins for Islamic bank subsidiaries.

#### 5.4. Robustness check

This study conducts robustness checks of our baseline results in two ways. First, we use dynamic panel regression to address the potential for endogeneity using the Generalized Method of Moment (GMM) (Arellano & Bond, 1991; Arellano & Bover, 1995). Second, in addition to the Adjusted Lerner Index, this study also utilizes the standard Lerner index (Lerner) to

check the robustness of the results. The standard Lerner index is calculated by the following formula:

$$Lerner = \left[\frac{Price - MC}{Price}\right]$$
(6)

Price is calculated by the income-to-assets ratio, and MC stands for marginal cost. Total cost and marginal cost are estimated using equations (4) and (5).

Table 6- part (1) presents the results of the dynamic panel method using two-step GMM with margin1 as the dependent variable. The bottom part of Table 6 indicates the diagnostic tests for GMM estimation. Our instruments are valid since the instruments are less than the number of the bank, and the Hansen test is rejected. Our results are the absence of autocorrelation problems based on the Arellano—Bond test for AR (2). The findings of the two-step GMM are consistent with previous results. Market power which is measured by the adjusted Lerner index, has a positive effect on Islamic bank margins. Income diversification negatively affects bank margins. Both CAR and CIR have a positive impact on bank margins.

Table 6. Robustness t	est: GMM method and	d Standard Lerner Index	
(1) GMM method		(1) RE: Stand	ard Lerner Index
Margin (-1)	0.2542***	Margin (-1)	-
	(0.0589)		-
Adjusted Lerner	0.0244*	Lerner	0.0063***
	(0.0150)		(0.0027)
Rsifn	-0.0628	Rsfin	-0.0488***
	(0.0580)		(0.0153)
Incdiv	-0.0782**	Incdiv	-0.0345***
	(0.0453)		(0.0132)
Lasset	0.0038	Lasset	0.0040
	(0.0084)		(0.0032)
CAR	0.3740***	CAR	0.0821***
	(0.1225)		(0.0315)
Fin	0.0772	Fin	0.0129**
	(0.0522)		(0.0058)
CIR	0.2415***	CIR	0.0086
	(0.0879)		(0.0152)
NPF	0.6919	NPF	-0.1048**
	(1.2216)		(0.0633)
Cons.	-0.3877***	Cons	-0.0283
	(0.1824)		(0.0504)
No. Obs.	663	No. Obs.	664
No. Banks	31	No. Banks	31
		R-sq within	0.0439
		R-sq overall	0.2117
Diagnostic tests		Diagnostic tests	
No. Instruments	29	F test	16.96***
AR (2) P-value	0.132	LM test	1108.10***
Hansen p-value	0.182	Hausman test	13.37

Note: \*, \*\*, and \*\*\* reject the null hypothesis at 10%, 5%, and 1%. Parentheses show the standard error.

Table 6- part (2) exhibits the results using the standard Lerner Index. According to the Hausman test, the random effect model is more pronounced than the fixed effect model. Our results are consistent with the adjusted Lerner Index. Lerner index is positive and statistically significant, meaning that Islamic bank margins are positively linked to an imperfect market with high market power. Risk-sharing financing also reduces bank margins. Other bank-specific variables also influence the bank margins. More diversified Islamic banks are lower bank margins. The high degree of risk aversion boosts bank margins. Islamic banks with higher financing also have a higher margin. Islamic banks with higher financing risk produce low margin rates.

#### 6. Conclusion

The findings document that market power influences bank margins. An imperfect market causes Islamic banks to charge a premium price for their products to generate higher margins. In addition, risk-sharing financing reduces bank margins. Several bank-specific variables also influence bank margins. Islamic bank with high-income diversification generates low bank margins. The higher degree of risk aversion and high financing boost bank margins. High financing also reduces bank margins. Indeed, the effect of market power on bank margins is stronger in Islamic bank subsidiaries. However, the role of risk-sharing financing in lowering bank margins is more pronounced in Islamic bank subsidiaries.

The results of this study are expected to provide important information for the management of Islamic banks and Indonesian Financial Service Authorities as policymakers. Market power is very influential on the margins of Islamic banks. This happens because the Islamic banking market is an imperfect competition market. As a result, the price of Islamic bank financing is expensive due to high bank margins. These results strongly suggest policy implications for Islamic banks. The high proportion of risk-sharing financing is one important way to reduce the price of financing products and intermediation costs.

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#### References

Abedifar, P., Molyneux, P., & Tarazi, A. (2013). Risk in Islamic banking. Review of Finance, 17(6), 2035–2096. https://doi.org/10.1093/rof/rfs041 Agoraki, M. E. K., & Kouretas, G. P. (2019). The determinants of net interest margin during transition. *Review of Quantitative Finance and Accounting*, 53(4), 1005–1029. https://doi.org/10.1007/s11156-018-0773-y

- Ahmed, A. (2010). Global financial crisis: An Islamic finance perspective. International Journal of Islamic and Middle Eastern Finance and Management, 3(4), 306–320. https://doi.org/10.1108/ 17538391011093252
- Ahn, S., & Choi, W. (2009). The role of bank monitoring in corporate governance: Evidence from borrowers' earnings management behavior. Journal of Banking & Finance, 33(2), 425–434. https://doi.org/10.1016/j. jbankfin.2008.08.013
- Al-Muharrami, S., & Murthy, Y. S. R. (2016). Interest banking spreads in Oman and Arab GCC. International Journal of Emerging Markets, 12(3), 532–549. https://doi.org/10.1108/IJoEM-02-2016-0033
- Alqahtani, F., & Mayes, D. G. (2018). Financial stability of Islamic banking and the global financial crisis: Evidence from the Gulf Cooperation Council. *Economic Systems*, 42(2), 346–360. https://doi.org/10. 1016/j.ecosys.2017.09.001
- Angbazo, L. (1997). Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking. *Journal of Banking & Finance*, 21(1), 55–87. https://doi.org/10.1016/S0378-4266(96) 00025-8
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo Evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–279. https://doi.org/10. 2307/2297968
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of

error-components models. *Journal of Econometrics*, 68(1), 29–51. https://doi.org/10.1016/0304-4076(94) 01642-D

- Azmat, S., Skully, M., & Brown, K. (2015). Can Islamic banking ever become Islamic? *Pacific Basin Finance Journal*, 34, 253–272. https://doi.org/10.1016/j.pacfin. 2015.03.001
- Baele, L., Bruyckere De, V., Jonghe De, O., & Vennet, R. V. (2007). Model uncertainty and systematic risk in US Banking. *Journal of Banking & Finance*, 31(7), 1999–2023. https://doi.org/10.1016/j.jbankfin.2006. 08.003
- Birchwood, A., Brei, M., & Noel, D. M. (2017). Interest margins and bank regulation in Central America and the Caribbean. *Journal of Banking & Finance*, 85, 56–68. https://doi.org/10.1016/j.jbankfin.2017.08.003
- Bougatef, K., & Korbi, F. (2018). The determinants of intermediation margins in Islamic and conventional banks. *Managerial Finance*, 44(6), 704–721. https:// doi.org/10.1108/MF-11-2016-0327
- Carbó Valverde, S., & Rodríguez Fernández, F. (2007). The determinants of bank margins in European banking. Journal of Banking & Finance, 31(7), 2043–2063. https://doi.org/10.1016/j.jbankfin.2006.06.017
- Chortareas, G. E., Garza-García, J. G., & Girardone, C. (2012). Competition, efficiency and interest rate margins in Latin American banking. *International Review of Financial Analysis*, 24, 93–103. https://doi. org/10.1016/j.irfa.2012.08.006
- Cruz-García, P., & Fernández de Guevara, J. (2020). Determinants of net interest margin: The effect of capital requirements and deposit insurance scheme. European Journal of Finance, 26(11), 1102–1123. https://doi.org/10.1080/1351847X.2019.1700149
- Entrop, O., Memmel, C., Ruprecht, B., & Wilkens, M. (2015). Determinants of bank interest margins: Impact of maturity transformation. *Journal of Banking & Finance*, 54, 1–19. https://doi.org/10.1016/j.jbankfin. 2014.12.001
- Fu, X., (MAGGIE), & Heffernan, S. (2009). The effects of reform on China's bank structure and performance. *Journal of Banking & Finance*, 33(1), 39–52. https:// doi.org/10.1016/j.jbankfin.2006.11.023
- Fungacova, Z., & Poghosyan, T. (2011). Determinants of bank interest margins in Russia: Does bank ownership matter? *Economic Systems*, 35(4), 481–495. https://doi.org/10.1016/j.ecosys.2010.11.007
- Hamid, F. S. (2017). The effect of market structure on banks' profitability and stability: Evidence from ASEAN-5 Countries. International Economic Journal, 31(4), 578–598. https://doi.org/10.1080/10168737. 2017.1408668
- Hasan, M., & Dridi, J. (2011). The effects of the global crisis on Islamic and Conventional Banks: A comparative study. Journal of International Commerce, Economics and Policy, 2(2), 163–200. https://doi.org/10.1142/ \$1793993311000270
- Ho, T. S. Y., & Saunders, A. (1981). The determinants of bank interest margins: Theory and empirical evidence. The Journal of Financial and Quantitative Analysis, 16(4), 581–600. Retrieved from, http://www. jstor.org/stable/2330377?origin=crossref
- Hutapea, E. G., & Kasri, R. A. (2010). Bank margin determination: A comparison between Islamic and conventional banks in Indonesia. International Journal of Islamic and Middle Eastern Finance and Management, 3(1), 65–82. https://doi.org/10.1108/ 17538391011033870
- Ibrahim, M. H., Aun, S., & Rizvi, R. (2017). Do we need bigger Islamic banks? An assessment of bank stability. Journal of Multinational Financial

Management, 40, 77–91. https://doi.org/10.1016/j. mulfin.2017.05.002

- Ibrahim, M. H., & Law, S. H. (2019). Financial intermediation costs in a dual banking system: The role of Islamic banking. Bulletin of Monetary Economics and Banking, 22(4), 529–550. https://doi.org/10.21098/ bemp.v22i4.1236
- Kasman, S., & Kasman, A. (2015). Bank competition, concentration and financial stability in the Turkish banking industry. *Economic Systems*, 39(3), 502–517. https://doi.org/10.1016/j.ecosys.2014.12.003
- Khan, H. H., Ahmad, R. B., & Chan, S. G. (2018). Market structure, bank conduct and bank performance: Evidence from ASEAN. *Journal of Policy Modeling*, 40 (5), 934–958. https://doi.org/10.1016/j.jpolmod.2018. 02.001
- Khan, H. H., Kutan, A. M., Ahmad, R. B., & Gee, C. S. (2017). Does higher bank concentration reduce the level of competition in the banking industry? Further evidence from South East Asian economies. *International Review of Economics and Finance*, 52 (September 2017), 91–106. https://doi.org/10.1016/j. iref.2017.09.006
- Khan, F. N. H. T., Malim, N. A. K., & Masron, T. A. (2021). Islamic Regulations and Islamic Banks Margins: An Empirical Investigation into Asean Countries. Journal of Islamic Monetary Economics and Finance, 7(1), 127–154. https://doi.org/10.21098/jimf.v7i1.1327
- Khattak, M. A., Saiti, B., & Khan, S. (2021, January). Does market power explain margins in dual banking? Evidence from panel quantile regression. International Journal of Finance & Economics, 1–19. https://doi.org/10.1002/ijfe.2510
- Koetter, M., Kolari, J. W., & Spierdijk, L. (2012). Enjoying the quiet life under deregulation? Evidence from adjusted Lerner Indices for U.S banks. The Review of Economics and Statistics, 94(2), 462–480. https://doi. org/10.1162/REST\_a\_00155
- Lee, S. P., & Isa, M. (2017). Determinants of bank margins in a dual banking system. *Managerial Finance*, 43(6), 630–645. https://doi.org/10.1108/MF-07-2016-0189
- Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). The expansion of services in European banking: Implications for loan pricing and interest margins q. Journal of Banking & Finance, 32(11), 2325–2335. https://doi.org/10.1016/j.jbankfin.2007.09.025
- Lin, J. R., Chung, H., Hsieh, M. H., & Wu, S. (2012). The determinants of interest margins and their effect on bank diversification: Evidence from Asian banks. *Journal of Financial Stability*, 8(2), 96–106. https://doi. org/10.1016/j.jfs.2011.08.001
- Maudos, J., & Fernández de Guevara, J. (2004). Factors explaining the interest margin in the banking sectors of the European Union. Journal of Banking & Finance, 28(9), 2259–2281. https://doi.org/10.1016/j.jbankfin. 2003.09.004
- Maudos, J., & Solís, L. (2009). The determinants of net interest income in the Mexican banking system: An integrated model. *Journal of Banking & Finance, 33* (10), 1920–1931. https://doi.org/10.1016/j.jbankfin. 2009.04.012
- Meslier, C., Risfandy, T., & Tarazi, A. (2020). Islamic banks' equity financing, Shariah supervisory board, and banking environments. *Pacific Basin Finance Journal*, 62, 101354. https://doi.org/10.1016/j.pacfin.2020. 101354
- Mirzaei, A., Moore, T., & Liu, G. (2013). Does market structure matter on banks' profitability and stability? Emerging vs. advanced economies. *Journal of Banking & Finance*, 37(8), 2920–2937. https://doi.org/ 10.1016/j.jbankfin.2013.04.031

- Nguyen, T. V. H., & Nguyen, T. V. H. (2022). How do banks price liquidity? The role of market power. *Global Finance Journal*, 53(April), 100736. https://doi.org/10. 1016/j.gfj.2022.100736
- Nguyen, M., Skully, M., & Perera, S. (2012). Market power, revenue diversification and bank stability: Evidence from selected South Asian countries. Journal of International Financial Markets, Institutions and Money, 22(4), 897–912. https://doi.org/10.1016/j. intfin.2012.05.008
- Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21(2), 222–237. https://doi.org/10.1016/j.ribaf.2006.03.007
- Risfandy, T., Harahap, B., Hakim, A. R., Sutaryo, S., Nugroho, L. I., & Trinugroho, I. (2020). Equity Financing at Islamic Banks: Do Competition and Bank Fundamentals Matter? *Emerging Markets Finance and Trade*, 56(2), 314–328. https://doi.org/10.1080/ 1540496X.2018.1553160
- Salleh, M. S., Possumah, B. T., & Ahmat, N. (2018). Net profit margin determinants of Islamic subsidiaries of conventional banks in Malaysia. Jurnal Ekonomi Malaysia, 52(2). https://doi.org/10.17576/jem-2018-5202-13
- Saunders, A., & Schumacher, L. (2000). The determinants of bank interest rate margins: An international study. *Journal of International Money and Finance*, 19(6), 813–832. https://doi.org/10.1016/S0261-5606(00) 00033-4
- Shaban, M., Duygun, M., Anwar, M., & Akbar, B. (2014). Diversification and banks' willingness to lend to small businesses: Evidence from Islamic and conventional banks in Indonesia. Journal of Economic Behavior & Organization, 103, S39–55. https://doi.org/10.1016/j. jebo.2014.03.021
- Sun, P. H., Mohamad, S., & Ariff, M. (2017). Determinants driving bank performance: A comparison of two types of banks in the OIC. *Pacific Basin Finance Journal*, 42, 193–203. https://doi.org/10.1016/j.pacfin. 2016.02.007
- Sutrisno, S., & Widarjono, A. (2022). Is profit loss- sharing financing matter for Islamic Bank 's Profitability? The Indonesian Case. *Risks*, 10(11), 1–13. https://doi. org/10.3390/risks10110207
- Tan, Y., & Floros, C. (2018). Risk, competition and efficiency in banking: Evidence from China. Global

Finance Journal, 35(December 2017), 223–236. https://doi.org/10.1016/j.gfj.2017.12.001

- Trinugroho, I., Agusman, A., & Tarazi, A. (2014). Why have bank interest margins been so high in Indonesia since the 1997/1998 financial crisis? Research in International Business and Finance, 32, 139–158. https://doi.org/10.1016/j.ribaf.2014. 04.001
- Trinugroho, I., Risfandy, T., & Ariefianto, M. D. (2018). Competition, diversification, and bank margins: Evidence from Indonesian Islamic rural banks. *Borsa* Istanbul Review, 18(4), 349–358. https://doi.org/10. 1016/j.bir.2018.07.006
- Warninda, T. D., Ekaputra, I. A., & Rokhim, R. (2019). Do Mudarabah and Musharakah financing impact Islamic Bank credit risk differently? Research in International Business and Finance, 49, 166–175. https://doi.org/10.1016/j.ribaf.2019.03.002
- Widarjono, A., Alam, M. M., & Rafik, A. (2023). The dynamic link between Islamic and conventional deposit rates in a dual banking system. ISRA International Journal of Islamic Finance, 15(1), 91–108. https://doi.org/10.55188/ijif.v15i1.487
- Widarjono, A., Mifrahi, M. N., & Perdana, A. R. A. (2020). Determinants of Indonesian Islamic Rural Banks ' Profitability: Collusive or Non- Collusive Behavior? The Journal of Asian Finance, Economics and Business, 7 (11), 657–668. https://doi.org/10.13106/jafeb.2020. vol7.no11.657
- Widarjono, A., Suharto, S., & Wijayanti, D. (2022a). Do Islamic banks bear displaced commercial risk? Evidence from Indonesia. Banks and Bank Systems, 17(3), 102–115. https://doi.org/10.21511/bbs.17(3).2022.09
- Widarjono A., Wijayanti, D., & Suharto, S. (2022b). Funding liquidity risk and asset risk of Indonesian Islamic rural banks. *Cogent Economics & Finance*, 10(1). https://doi.org/10.1080/23322039.2022. 2059911.
- Wijaya, I. F., & Moro, A. (2022). Trustworthiness and margins in Islamic small business financing: Evidence from Indonesia. Borsa Istanbul Review, 22, S35–S46. https:// doi.org/10.1016/j.bir.2022.10.010
- Zarruk, E. R., & Madura, J. (1992). Optimal bank interest margin under capital regulation and deposit insurance. *The Journal of Financial and Quantitative Analysis*, 27(1), 143–149. https://doi.org/10.2307/ 2331303