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# **Driven Determinants to Indonesia Sharia Commercial Banks' Performance: The Important Role of Diversification Strategy**

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## Abstract

- **Purpose:** This study aims to analyze the role of income diversification and asset diversification on the sensitivity of the determinant of the Net Operating Margin (NOM) of Islamic Commercial Banks (ICB) in Indonesia.
- **Design/Methodology/Approach:** By using the technique of the endogenous switching regression analysis, the researcher assumes that the influence of the NOM's determinant can be different when the bank has high or low diversification. By dividing the two regimes on the diversification variable, the researcher can determine which regime the NOM will be more sensitive to the fluctuation of the NOM's determinant.
- **Findings:** The results of this study indicate that operational costs have an essential role in determining the level of NOM. NOM tends to be more sensitive to its determinants when the ICB is not functionally diversified compared to ICB, which diversifies its income and assets. This study also found that a large ICB has a greater probability of diversifying high income than a small ICB.
- **Research limitations/implications:** This study has limitations, among others, this study only covers Islamic commercial banks in Indonesia for a certain period due to data availability. This study also only focuses on the company's internal variables, so that future researchers can use a wider range of data and external variables to enrich the diversification effect.
- **Practical implications:** This study has several important policy implications for banks regarding a detailed description of the benefits of asset diversification and income diversification. In addition, the results of this study can also be used as a reference for policy makers, especially the government if they want to build an ideal NOM ratio for the Islamic banking industry by establishing regulations related to the efficiency level of Islamic banking in carrying out financial intermediation activities.
- **Originality/value:** This study contributes to the recent literature that presents the role of income diversification and asset diversification on the sensitivity of the determinants of Net Operating Margin (NOM) in Islamic Commercial Banks (ICB) in Indonesia.
- **Keywords:** Net Operating Margin, Diversification, Islamic Commercial Banks, Endogenous Switching Regression.

## 1. Introduction

Net operating margin (NOM) is a financial performance measure of profitability in Islamic commercial banks (ICB). NOM is a ratio that represents the ICB's ability to create profit by considering the difference between the revenues generated from financing activities and costs incurred in raising activity. Banking margins are often linked by the level of banking efficiency, especially in Indonesia, which is a developing country. Higher spread is usually an indication that banks are economically inefficient in performing intermediation activities in mobilizing the resources that can be invested (Demirguc-Kunt, Laeven, & Levine, 2003). Conversely, lower spread reflects the efficiency of intermediation costs and the effectiveness of the monetary policy. As the importance of the margin level in banking industry, some previous researchers had attempted to determine and analyze the characteristics that can describe the level of a bank's margin (Moslehpour et al., 2022). Ho and Saunders were the first researchers to develop a model dealership to determine the determinant of a conventional bank margin in the United States (Ho & Saunders, 1981). Furthermore, other researchers had also carried out the expansion of the Ho and Saunder's model thereafter to include other factors which may reflect the level of bank margins, such as (Maudos & De Guevara, 2004) and (Valverde & Fernández, 2007) where the models are generally analyzed on conventional banks whose operations are based on interest. However, the margin determinant of banking institutions may have different effects when applied in the context of Islamic banking operations that do not rely on the interest. Thus, the issues related to how the net operating margin in ICB in Indonesia is optimally determined and how their sensitivity to changes in the banking environment need to be studied further.

Islamic bank in Indonesia is a unique object for study, especially at the level of its margin. Some previous researchers revealed that the overall margin rate of banking institutions in Indonesia are relatively high compared to other countries such as in Asia, East Asia, and ASEAN, in which the average margin of banks in Indonesia are in the top four percent (López-Espinosa, et al., 2011; Lin, et al., 2012; Istan and Fahlevi 2020). Some of the previous investigators discovered overpricing behaviour in an ICB that operates with a higher margin level compared to conventional banks (Olson & Zoubi, 2008; Shaban, Duygun, Anwar, & Akbar, 2014; Darma and Afandi 2021). The importance of maintaining the level of bank margins as well as the nature of the revenues in traditional activities (main) cyclical, in which the nature of the revenues in traditional activities depend on the strength of customer demand and changes in the economic cycle (Lin et al., 2012), causing some of the banking industry in the various countries pursuing a strategy of diversification of financial products is

no exception to the ICB in Indonesia (Abedifar, Molyneux, & Tarazi, 2013; Birchwood, Brei, & Noel, 2017; Achsani and Kassim 2021). This diversification strategy can be done either through the diversification of their assets such as channel financing to other various types of contracts, and other financial services' potential income are a variety of ways, including diversifying revenues in non-traditional activities such as revenue services (fee) as well as commission revenue (Ibrahim & Law, 2019). Diversification of activities is expected to reduce their dependence on traditional activities, face the level of competition, increase market share and reduce the risk. Some previous researchers have studied the benefits of diversification, but the results of empirical research tend to be varied and inconclusive.

According to the hypothesis conglomerate, diversification activities can add value because they can provide one-stop shopping to consumers whom willing to pay more to increase their income (Berger, Bonime, Covitz, & Hancock, 2000). On the other hand, according to the hypothesis-focused strategy, financial institutions should focus on a single business line to take the greatest advantage of the expertise of management and reduce agency problems (Jensen, 1986). The decline in the net operating margin level in Islamic banking in Indonesia during the 2010-2017 period can lead to several interpretations when viewed from a different perspective. The declining margin level may reflect the effectiveness of monetary policy and a competitive system in the banking industry (Hao & Wong, 2021). However, the declining margin may also reflect a decline in sharia banking performance which can be caused by the large cost of raising funds compared to the income obtained from disbursing funds (M. S. Johari, 2014; Quyen et al. 2021). The margins decline in Islamic banking can also occur due to diversification activities that can create a cross-subsidization strategy in banking institutions, so that there are new sources of income which have implications for reducing intermediation costs that can benefit the welfare of the community.

This phenomenon can lead to polemics related to the benefits of carrying out a diversification strategy on banking margins. Previous studies had explored the benefits of diversification although the results of these studies were still varied and tend to be contradictory. In addition, previous studies did not sufficiently take into account the impact of regime shifts when banks carried out low and high levels of diversification on the margins of Islamic banking. The issues on how the net operating margin of Islamic banks in Indonesia are optimally determined and how the sensitivity of the net operating margin to changes in the banking environment need to be studied further. Therefore, the questions arise in this study, namely: Are financing risk, liquidity risk, market share, operational costs, and capital a determinant of the net operating margin of Islamic Commercial Banks in Indonesia? Does

diversification affect the sensitivity of the determinants of net operating margin for Islamic commercial banks in Indonesia? Therefore, this study aims to analyze the role of income diversification and asset diversification sensitivity through NOM determinants in Indonesia during 2010-2017. Using the technique of the endogenous switching regression analysis, the researchers assumed that the determinant influence on the NOM might be different when the bank diversified into high and low diversification. By dividing the two regimes on diversification variables, researchers can determine at what NOM regime will be more sensitive to the fluctuations of its determinants. These results indicated that operating costs have a vital role in determining the level of NOM. NOM tends to be more sensitive to its determinants when ICB is not functionally diversified than when ICB diversifies income and assets. The study also found that a large ICB has a greater probability of diversifying revenue higher than small ones. A review of the prior literature was presented in Section 2, followed in Section 3 by a description of the dataset and an explanation of the methodology adopted for this study. Accordingly, empirical results were presented in Section 4. Finally, the conclusions were presented in Section 5.

## **2. Literature Review**

### **2.1 Effect of financing Risk on Net Operating Margin**

Financing risks are the potential losses faced by banks when the debtor does not fulfill its obligation to return the capital, and the handed portion of profits has been agreed upon. In practice, there is always a trade-off in assessing the risks and returns. Banks always want to adjust prices based on the financing of customer financing risk (Lepetit, Nys, Rous, & Tarazi, 2008). The higher the risk, the greater the bank returns expected from the finance portfolio (risk-return trade-off). As a result of these risks can increase margins through pricing Islamic bank financing higher. Fungáčová and Poghosyan (2011) found a negative relationship between risk and margin financing banks in Australia, Kenya, and Russia when using a non-performing loan (NPL) as a proxy that is different from previous studies. They found a negative relationship that can be explained by using the argument to the Russian market discipline (Karas, Pyle, & Schoors, 2013). Based on that argument, depositors require higher premiums to deposit their savings in banks that are riskier, for example, to banks with higher non performing loans ratio. The increase in deposit rates will ceteris paribus contribute to the decline in interest margins, thereby establishing a negative relationship between non performing loans and margin.

*H1: Financing Risk negatively affects the net operating margin.*

## **2.2 Effect of Liquidity Risk on Net Operating Margin**

Liquidity for the bank includes the ability of Islamic banks to meet mature liabilities and the ability of Islamic banks to obtain cheap funds. From two such coverages, it can be ascertained that the bank's asset portfolio is dominated by illiquid assets. The main composition of bank assets is the entire financing extended to the majority of debtors whose term of more than one year. On the other hand, the majority of which is owned bank liabilities derived from third-party funds, which all deposits with a term of less than one year. Therefore mismatch on aspects of the period, the bank will easily be exposed to liquidity risk. Ascarya and Yumanita (2010) found a positive and significant relationship between liquidity risk and the margin of banks in Indonesia in 2006-2009. Liquidity risk can be positively related to bank margins because when more liquid assets are owned by the bank compared with its obligations, the higher the level of the bank's margin. According to them, the reason behind this positive correlation is based on the commercial banking market structure in Indonesia tends to be concentrated. Moreover, Brock and Suarez (2000) found that the liquidity risk is measured using the loan to deposits ratio was positively related to bank margin, it is based on the argument that the greater the LDR owned banks, characterizing that the bank has a high intermediation ratio in channel financing to the public. This will trigger increased bank margins because revenues from the distribution of funding are likely to be higher than the cost of raising funds. According to Birchwood, Brei, and Noel (2017), LDR can have a positive tie to the margins.

Islamic bank liquidity risk is measured by using the financing to deposit ratio (FDR), which is an intermediation ratio that reflects the ability of Islamic banks in channeling funds to the community (Johari & Ramadhania, 2019). The higher the ratio, the higher the FDR banking liquidity risk. However, it will be whether banks in disbursing financing and earning income from financing activities. From the perspective of economies of scale, the greater the distribution of funding, then there are efficiency benefits arising from the cost per unit for the management and distribution of the financing portfolio, which means that the bigger the bank channel financing of the revenue from the activity of the finance portfolio will be greater than the costs incurred from the activity of collection, causing the bank's net operating margin to be increased (Fungáčová & Poghosyan, 2011).

*H2: Risk Liquidity positively affects the net operating margin.*

## **2.3 Effect of Third Party Funds Market Share on Net Operating Margin**

The paradigm of market forces stated that the increase in market forces would lead to gains and benefits to monopolize the market, which will lead to increased levels of a bank's margin. Hypothesis structure-conduct-performance revealed that the banks in a concentrated market tend to collude in setting their interest margins and thus can improve the net interest margin (Naceur & Omran, 2011). Thus, the larger banks can use their market power in pricing and pay a lower rate for depositors to get a higher margin. Market power held by banks may also be reflected in the market share of banking, and this is supported by several empirical studies that measure the strength of a bank in the market using market share as Lee and Isa (2017) and Perera, Skully, and Wickramanayake (2010). A cross-country study by Demirgüç-Kunt and Huizinga (1999) found that banks with a market share a greater positive impact on the interest margin so as to increase their margins.

*H3: Third-party fund market share positively affects the net operating margin*

#### **2.4 Effect of Operating Costs on Net Operating Margin**

The concept of operating costs can affect the margin of banks was proposed by Maudos and De Guevara (2004). They developed the main model of Ho and Saunders (1981) by adding variable operating costs as a critique of their model that the model fails to consider the bank as a company with production function related to intermediation services, such as administrative fees for maintaining the loan or contract deposits. Maudos and De Guevara (2004) responded to this criticism and extended their model by adding the operating costs of production functions to capture bank-related bank services. Also, they considered the bank's operating costs as a determinant of banking margins. They found, in essence, even in the absence of market power and all types of risks, the banks had to close their operating costs, which are a function of the deposits taken and loans. Therefore, banks operating at a higher level of costs have to charge a higher margin. They found a positive relationship between bank margins and operating costs in the European banking sector. Therefore, banks operating at a higher level of costs have to charge a higher margin.

*H4: Operating costs have a positive effect on the operating margin.*

#### **2.5 Effect of Capital on Net Operating Margin**

The level of capital in this study was measured using the ratio of equity to total assets. The ratio of equity to total assets measures how much capital banks used to fund the entire assets of the company. The higher the ratio of equity to total assets reflects the higher the equity to assets ratio, the less leverage, meaning that a greater percentage of assets is owned



by the company and its investors. If the source of the equity funds is more expensive than external funding sources, banks will tend to assign a high margin to fund their equity (Gasbarro, Wong, & Zumwalt, 2012). The relationship between capital and Islamic banking margins is disclosed by empirical research in various countries. Brock and Suarez (2000) argued that for banks that have a bad or risky capitalization might have an incentive to lower interest rates on loans and raise interest rates on deposits to obtain a larger market share so that the level of capital can have a positive relationship to the margins. Additionally, Gambacorta and Shin (2018) found that a high ratio of equity to total assets associated with a lower cost of raising funds in developed countries, where the cost benefits that were priced at the margin, then the relationship between equity to total assets and margins can be negative.

*H5: Capital positively affects net operating margin*

## **2.6 Effect Of Diversification to The Financing Risk, Liquidity Risk and Net Operating Margin**

Islamic banks must abide by Sharia laws so that the benefits of diversification should have been more pronounced in the Islamic banks because of their risk sharing features ensure mitigation of any increased risks associated with diversification. The non-exploitative nature (prohibition of interest-based loans) of Islamic banking ensures fairness between the different stakeholders so that the agency problem resulting from diversification should be minimized in Islamic banks (Magalhães & Al-Saad, 2013). Additionally, Islamic banks are usually less diversified than conventional banks (Chatti, Kablan, & Yousfi, 2013). (Moudud-Ul-Huq, Ashraf, Gupta, & Zheng, 2018) analyzed the impact of diversification of income and assets on the performance and risks of banks in ASEAN countries in 2011-2015 found that income diversification on banks in Indonesia can be more profitable because it can improve performance and reduce risk. The results are consistent with Chen, Liang, and Yu (2018), which suggested that the diversification of assets plays a role in the performance of Islamic banks in Indonesia, Malaysia, and Pakistan within 2006 to 2012 time period. They found that diversification of assets had a positive effect on the profitability and efficiency of Islamic banking. In measuring the effects of diversification income, Gamra and Plihon (2010) found a non-linear relationship between diversification, risk, and performance of the 714 banks in East Asia and Latin America.

*H6: different Islamic banks have different risk sensitivities: those who have a higher level of revenue diversification and hold more diversified assets get higher risk sensitivity.*

*H7: different Islamic banks have different liquidity risk sensitivity: those with a higher level of revenue diversification and hold more diversified assets get liquidity higher risk sensitivity.*

## **2.7 Effect of Diversification on The Third Party Funds Market Share and Net Operating Margin**

Relative Theory of Market Power (RMP) stressed that only companies that have a large market share and differentiated products that can use market forces and profit above normal (Shepherd, 1986). In the theory of the market's power is one reason the company to diversify is to increase market share. Therefore, banks are diversifying expected to have a large market share so that they can use the market power to set interest rates low savings, and high-interest rate loan to increase the margin of the bank. Nguyen (2012) examines the relationship between market power and revenue diversification and found a non-linear relationship between the bank and the market power of banks to diversify their income in ASEAN. At a low degree of market power in the market of loans and deposits, the bank manager tends to find and take advantage of new growth opportunities in non-traditional markets, leading to higher revenues from non-traditional activities. On the other hand, banks with greater market power in the market of loans and deposits are more focused on traditional interest-based products (net interest income).

*H8: The sensitivity of the market share of third party funds to the Net Operating Margin (NOM), differs between Islamic commercial banks which have a low level of income diversification and low asset diversification.*

## **2.8 Effect of Diversification, Operating Expenses and Net Operating Margin**

One reason for the bank to diversify is due to potential cross-selling to increase the scope of the banking economy (Elsas, Hackethal, & Holzhäuser, 2010). The existence of the conditions under which the bank has a long-term relationship with their clients can benefit banks by collecting extensive information about customers and using this information again, not only in the business areas in which the information was originally collected but also in areas unrelated to business. Banks are diversifying in related businesses can take them to benefit costs and gain a broader economic sphere. Gertner and Scharfstein (1991) argued that internal capital markets increase the incentive to perform monitoring. Although monitoring the diversified company can improve operational performance, it can also increase operating costs significantly. These results can be interpreted that at the level of lower revenue diversification, banks can benefit from the economic sphere (economies of scope) and bring

the cost per unit lower. However, efficiency gains decreased at a rate of excessive diversification. Therefore, excessive diversification into non-traditional activities does not improve efficiency.

*H9: The sensitivity of operating costs to Net Operating Margin (NOM), does not differ between Islamic Commercial Banks that have a high level of income diversification and high asset diversification*

## **2.9 Effect of Diversification on Capital and Net Operating Margin**

Banks use debt financing for most of them, in which the equity capital serves as a buffer to absorb losses and reduce the likelihood of financial difficulties. The higher equity than its total assets reflects a greater percentage of assets owned by the company and its investors that banks have the ability to absorb greater risk and can increase public confidence. On the other hand, the higher the bank's equity reflects the fewer resources other than equity funds in bank assets such as Third Party Fund (DPK), liabilities to other banks, issuance of securities, and so on, thus reducing the probability of banks to create profit.

More diversified banks have a relatively greater need for equity capital, especially if diversification involves expansion into sectors in which the bank is less effective in managing it (Egozcue and Wong, 2010; Hoang, et al., 2015; Lu, et al., 2018; Ortobelli Lozza, et al., 2018; Thanh, et al., 2021; Wong, et al., 2022). Readers may refer to Coronado, et al. (2020), Sahoo and Kumar (2021), Shiba and Gupta (2021), Aor, et al. (2021), Thanh, et al. (2021), and Adebayo, et al. (2022) for other properties of diversification for bank. However, the bank with a high level of the capital market has a large probability of diversifying both the asset and the earnings (Karakaya & Er, 2013). Meanwhile, DeYoung and Roland (2001) found that banks with non-traditional sources of income can increase earnings volatility. Readers may refer to Trang, et al. (2021), Nhan, et al. (2021a,b) and Sahoo and Kumar (2021) for other properties for bank. Large banks that are more involved in the derivatives market and have a great degree of asset diversification tend to have lower capital ratios, and thus, lowering the probability of banks increasing margins high. Consequently, the NOM sensitivity of capital might be different when the ICB diversifies income and asset diversification.

*H10: The sensitivity of capital to Net operating Margin (NOM), differs between Islamic Commercial Banks which have a high level of income diversification and Islamic Commercial Banks which have a high level of asset diversification.*

## **3. Research Framework, Data and Methodology**

The data analysis technique used in this study uses Seemingly Unrelated Regression and Endogenous Switching Regression. Researchers first estimate the determinants of NOM using the Seemingly Unrelated Regression (SUR) model in order to solve the problem if the equations in a system are correlated with one another. The SUR model is estimated using the Feasible Generalized Least Square (FGLS) method which is a method for estimating the parameters of the variance component in the error covariance matrix, where the error covariance cannot be known.

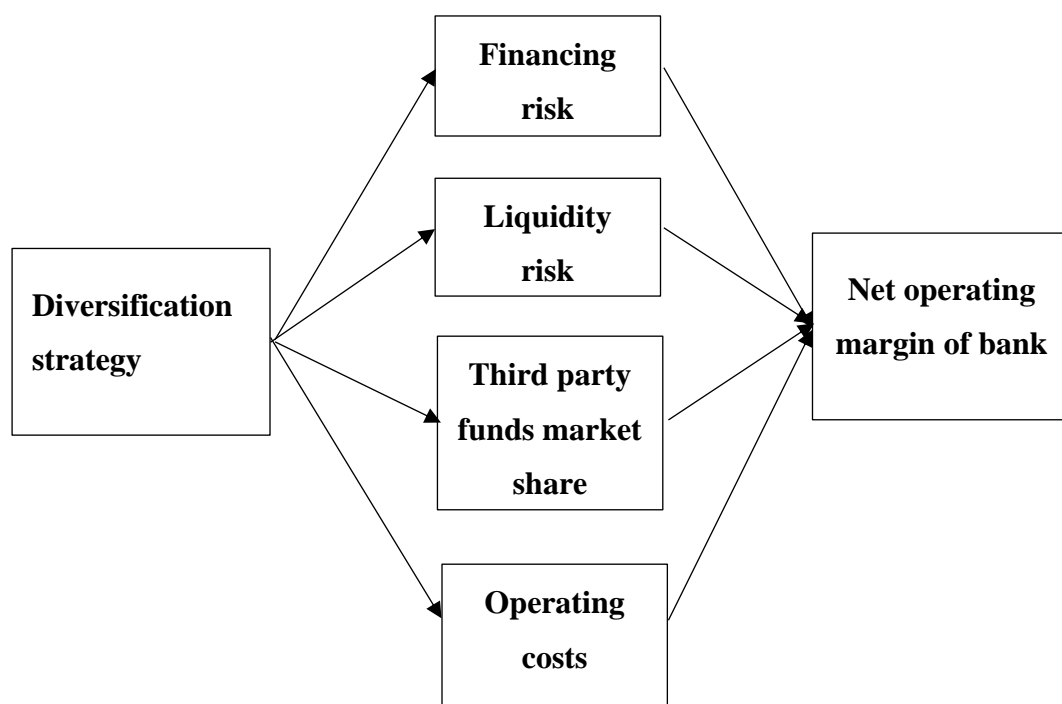
Some studies in the literature, for example, Ibrahim and Law (2019), Johnes, Izzeldin, and Pappas (2014), Abdul-Majid, Falahaty, and Jusoh (2017), and Alqahtani, Mayes, and Brown (2017) have examined the benefits of diversification in banking varied widely using various methods. However, very few studies, if there are any, discuss the benefits of diversification on the sensitivity of the determinants of NOM in ICB. To bridge the gap in the literature, in this paper, we analyze the role of diversification by employing the endogenous switching regression data analysis technique because we believe that the effect of NOM determinants on NOM can be different and it depends on the level of diversification. In addition, we examine whether the NOM regime at ICB will be more sensitive to fluctuations in the determinants of NOM by dividing two regimes on the diversification variable.

To determine the effect of diversification on the sensitivity of the determinants of NOM, we employ the endogenous switching regression (ESR). The ESR model is based on Hu and Schiantarelli (1998) regression model which allows researchers to assess the statistical significance of different bank characteristics in determining the probability that the NOM function is in one of two regimes, namely, at a high diversification level or a low diversification level. The determination of whether the bank is in a regime with high and low levels of diversification is carried out endogenously in each period. Thus, the ESR model is the most appropriate model because it can effectively capture the static and dynamic effects of the determinant variables of bank net operating margins and bank diversification variables.

### **3.1 Research framework**

In this study, the dependent variable was the margin of Islamic banks measured using the ratio net operating margin (NOM). This measure is a ratio on the profitability aspect that calculates the level of business efficiency and the ability of the bank to generate profits. NOM is the net operating income (the difference between financing income and payments to depositors and other investment account holders) of total assets.

Meanwhile, the independent variables in this research were financing risk, liquidity risk, market share of third-party funds, operating costs and capital. The latent variables in this study were diversification of income and diversification of assets. Income diversification is a variation from net operating income to net income from financing activities (net financing income) and non-financing activities (non-financing income). Meanwhile, asset diversification in this study only measured the variability of the distribution of financing compared to total assets.



**Figure 1. Research framework**

### **3.2 Data**

This study used a sample of the Islamic Banks in Indonesia, which was already up and spin-off in 2010, and published financial statements from the first quarter of 2010 to the fourth quarter of 2017. The data used in the form of financial ratios panel data published by the financial services authority period 2010- 2017. Our final dataset panel was comprised of 10 banks, providing a total of 320 bank-year observations. Table 1 reports the median and means values of the bank variables, while Table 3 depicts the Pearson correlation coefficients of all of the variables used in this study. We extended the models of Lin et al. (2012), utilizing a switching model of NOM in an attempt to determine the importance of bank diversification; the models were based on the Hu and Schiantarelli (1998) endogenous

switching regression models. Depending on the switching function, the net interest margin equation can be in either of two regimes, both of them which are unobserved by the researcher and characterized by different values of the coefficients of the bank-specific control variables. The estimation of the switching function enables statistical and economic significance assessment of the characteristics of the different banks in determining the probability of being in one of two regimes: a 'high degree of diversification' (hd) or a 'low degree of diversification' (ld). For the net operating margin equation for bank  $i$ , operating in a low degree of diversification regimes, at time  $t$ , we use the basic specification of the following switching model of net interest margins:

$$NOM_{it} = \alpha_0 + \beta_1 NPF_{it} + \varepsilon_{it}, \quad (1)$$

$$NOM_{it} = \alpha_0 + \beta_2 FDR_{it} + \varepsilon_{it}, \quad (2)$$

$$NOM_{it} = \alpha_0 + \beta_3 MS_{it} + \varepsilon_{it}, \quad (3)$$

$$NOM_{it} = \alpha_0 + \beta_4 BO_{it} + \varepsilon_{it}, \quad (4)$$

$$NOM_{it} = \alpha_0 + \beta_5 EQTA_{it} + \varepsilon_{it}, \quad (5)$$

$$NOM_{it} = \alpha_0 + \beta_1 NPF_{it} + \beta_2 FDR_{it} + \beta_3 MS_{it} + \beta_4 BO_{it} + \beta_5 EQTA_{it} + \varepsilon_{it}, \quad (6)$$

and

$$I_{it} = 1 \text{ if } \gamma Z_{it} + U_{it} > 0,$$

$$I_{it} = 0 \text{ if } \gamma Z_{it} + U_{it} \leq 0.$$

Thus, we have:

$$NOM_{it} = \begin{cases} X_{it}\beta^{LD} + \varepsilon_{1,it} & \text{If } Z_{it}\gamma + u_{it} \leq 0 \\ X_{it}\beta^{HD} + \varepsilon_{2,it} & \text{If } Z_{it}\gamma + u_{it} > 0 \end{cases}. \quad (7)$$

Models from Equation (1) to Equation (6) aim to answer the first research question by using the technique of the seemingly unrelated regression, while the Model in (7) aims to answer the second question by using the technique of the ESR analysis where NOM is the net operating margin, NPF is non-performing finance as a proxy of risk financing, FDR is financing to deposit ratio as a proxy of liquidity risk, MS is the market share, BO is the operating costs, ETA is equity to total assets as a proxy of capital, and the  $Z_{it}$  vector in each of the specifications of the switching function represents a set of diversification variables comprised of the ratio of non-financing income to both total operating income (NFI) and the loans-to-assets ratio (LTA). Followed by Baele, De Jonghe, and Vander Vennet (2007) to adopt a pragmatic definition of the degree of functional diversification for our empirical analysis, relying on one asset-based measure and one broad measure of the relative diversification, both of them which are publicly available and widely used by analysts and

investors to assess the long-term potentials and risks of banks. Any bank with a lower loans-to-assets ratio or a higher proportion of non interest revenue was regarded as being more oriented towards non-traditional banking activities. An alternative approach is to follow Baele et al. (2007) and Laeven and Levine (2007) to construct measures of asset and revenue diversity in which asset diversity is based on the stock variables, while revenue diversity is based on the flow variables, with these diversity measures defined as follows: Diversity =  $1 - |2x - 1|$  where x is either the loans-to-assets ratio or the ratio of non interest income to total operating income. The diversity variables take values between 1 and 0, with an increase of the degree of diversification. The ESR model developed by Hu and Schiantarelli (1998) assumes that the vector of the error terms  $(\varepsilon_{1it}, \varepsilon_{2it}, u_{it})$  are normally distributed and independent with an average equal to zero and the covariance matrix  $\Sigma$  such that

$$(\varepsilon_{1it}, \varepsilon_{2it}, u_{it}) \sim N(0, \Sigma), \Sigma = \begin{bmatrix} \sigma_1^2 & \sigma_{12} & \sigma_{1u} \\ \sigma_{21} & \sigma_2^2 & \sigma_{2u} \\ \sigma_{u1} & \sigma_{u2} & \sigma_u^2 \end{bmatrix},$$

and the NOM function is the probability of occurrence of each regime such that

$$\begin{aligned} \text{Prob}(=) M_{it} \text{NOM}^{LD}_{it} &= \text{Prob}(Z_{it}\gamma + u_{it} < 0) \\ &= \text{Prob}(u_{it} < -Z_{it}\gamma) \\ &= \Phi(-Z_{it}\gamma), \\ \text{Prob}(=) M_{it} \text{NOM}^{HD}_{it} &= \text{Prob}(Z_{it}\gamma + u_{it} \geq 0) \\ &= \text{Prob}(\geq u_{it} - Z_{it}\gamma) \\ &= 1 - \Phi(-Z_{it}\gamma). \end{aligned}$$

#### 4. Empirical Analysis

Table 1 shows the average and median values of all variables and samples used in this study, as well as its descriptive statistics. Table 1 also depicts the average value of each cross section for all research variables from 2010 to 2017: Net Operating Margin (NOM), financing risk/Non-Performing Finance (NPF), liquidity risk/Financing to Deposit Ratio (FDR), Operational Costs (BO), Capital/Equity to Total Assets (ETA), and Market Share (MS). Diversification is measured using Revenue Diversification (Rd) and Asset Diversification (Ad). Meanwhile, the instrument variable for diversification is measured using Loan to Total Assets (LTA), Net Financing Income (NFI), and Net Financing Income (NFI) (NFI). Diversification of assets and income are measured using the formula  $1 - |2x - 1|$ , where x is the loan to total assets and non-financing income to total operating income.





**Table 1.** Descriptive statistics

Variables Bank											mean	median
	BCA	BJB	BNIS	BRIS	BSM	BUK	MEGA	MUA	PANIN	VIC		
<i>NOM<sub>it</sub></i>	2.98	3.11	3.95	3.90	3.27	1.79	6.44	2.22	2.49	2.02	3.21	2.66
<i>NPF<sub>it</sub></i>	0.29	2.83	1.66	2.97	2.47	3.11	2.29	2.95	1.12	2.98	2.27	1.94
<i>FDR<sub>it</sub></i>	86.54	102.46	91.24	94.43	88.20	69.09	92.01	95.36	108.56	74.28	90.22	91.41
<i>BO<sub>it</sub></i>	5.61	7.66	4.28	4.93	5.80	4.94	9.79	4.26	3.98	4.98	5.62	4.80
<i>ETA<sub>it</sub></i>	23.98	16.45	11.47	10.01	7.39	9.86	11.76	6.91	25.90	20.01	13.7	11.38
<i>MS<sub>it</sub></i>	0.90	2.52	9.94	10.20	3.36	3.77	4.28	26.84	2.13	0.55	6.44	4.26
<i>Ad<sub>it</sub></i>	41.55	54.80	59.32	41.00	41.66	43.94	41.93	43.93	57.94	65.50	49.15	49.54
<i>Rd<sub>it</sub></i>	34.00	23.66	32.74	23.69	51.13	51.45	44.14	38.75	24.63	54.59	37.87	32.34
<i>LTA<sub>it</sub></i>	77.52	72.30	70.30	79.49	79.16	78.02	79.03	78.03	67.65	58.69	74.01	75.11
<i>NFI<sub>it</sub></i>	17.74	16.00	16.37	11.84	26.22	27.74	25.07	19.37	12.31	29.76	20.25	16.17
<i>Size<sub>it</sub></i>	14.60	15.26	16.48	16.55	17.84	15.22	15.63	17.54	14.82	13.74	15.77	15.67

It is common for researchers to use cross-sectional regression to obtain answers for the first research question about the determinants of the NOM of ICB in Indonesia, as well as to obtain answers for the first to fifth hypotheses. To do so, we recommend researchers to employ the two-stage regression analysis to determine the best estimator between the ordinary least squares (OLS) and seemingly unrelated regression (SUR). In the first stage, researchers can apply the Lin et al. (2012)'s approach to use the OLS analysis technique (Table 2) to produce the results of the first to sixth models. The OLS analysis technique assumes that the independent variables have no correlation, that the variance is constant, and that the average is equal to zero. If these assumptions are satisfied, the results from the OLS analysis technique will be efficient and effective.

If the test results in the first stage do not meet the OLS assumptions, with simple regression and multiple regression yielding inconsistent results, then correlated independent variables and correlated errors between simple regression models can be discovered. As a result, the OLS model is inapplicable, and the SUR analysis technique with Feasible Generalized Least Squares (FGLS) estimation is required to account for the correlation between error terms. In table 2, the researcher performs a simple regression analysis of the determinants of the net operating margin, as seen in the first to fifth models, and then compares it to a multiple regression analysis using the OLS estimation method in model six to determine the consistency of the research results.

**Table 2.** Cross-Sectional Regression Using OLS

Variabel	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Constan t	3.47 (14.12)***	2.70 (4.98)***	1.43 (8.49)***	3.65(16.59)***	3.23 (20.18)***	2.31 (3.99)***
<i>NPF<sub>it</sub></i>	-0.002 (-1.19)					-0.006 (- 3.72)**
<i>FDR<sub>it</sub></i>		0.005(0.97)				0.006 (1.41)
<i>BO<sub>it</sub></i>			31.73(13.10)** *			31.61(13.30)** *
<i>ETA<sub>it</sub></i>				-2.98(-2.36)**		-4.785 (- 3.70)**
<i>MS<sub>it</sub></i>					-0.11 (-0.11)	-0.601 (-0.66)
<b>R<sup>2</sup></b>	0.004	0.003	0.350	0.017	0.00	0.392
<b>F-stat</b>	1.41	0.94	171.53	5.55	0.01	40.59

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively.

According to Table 2, there are inconsistencies in the analysis results in the simple regression and multiple regression models, which can be seen in the first and sixth models, where the NPF variable, which is a proxy for financing risk, does not have a consistent significance to NOM at ICB. The inconsistency of results in the NPF variable can indicate that there is a strong correlation between the NPF variable and other independent variables, as well as a correlation between the residuals in each simple regression model, as demonstrated by the researcher's examination of the correlation matrix between the independent variables in table 3 and the residuals in each model. Table 4 shows a simple regression as follows:

**Table 3.** Correlation matrix

	<i>NOM<sub>it</sub></i>	<i>NPF<sub>it</sub></i>	<i>FDR<sub>it</sub></i>	<i>BO<sub>it</sub></i>	<i>ETA<sub>it</sub></i>	<i>MS<sub>it</sub></i>	<i>Ad<sub>it</sub></i>
<i>NPF<sub>it</sub></i>	-0066						
<i>FDR<sub>it</sub></i>	0054	-0.0893					
<i>BO<sub>it</sub></i>	0591***	0.0544	-0015				
<i>ETA<sub>it</sub></i>	-0.1310**	-0.4724**	0.0727	-0.0509			
<i>MS<sub>it</sub></i>	-0.0064	0.1508**	0.0172	-0.0775	-0.4761**		
<i>Ad<sub>it</sub></i>	0.0044	-0.0741	-0.0942	-0.0243	0.0012	0.0062	
<i>Rd<sub>it</sub></i>	-0.1969**	0.1182**	-0.2401**	0.1289 **	-0.0965	0.1693**	0.0920

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively.

**Table 4.** Cross-sectional regression using SUR

<b>Variables</b>	<b>Model (1)</b>	<b>Model (2)</b>	<b>Model (3)</b>	<b>Model (4)</b>	<b>Model (5)</b>	<b>Model (6)</b>
<b>Constant</b>	3.23 *** (26.02)	3.21 *** (25.33)	2.58 *** (20.16)	3.23 *** (25.91)	3.22 *** (25.99)	3.23 *** (26.02)
<b><i>NPF<sub>it</sub></i></b>	-0,004 (-0.74)					-0.01 (-0.82)
<b><i>FDR<sub>it</sub></i></b>		3.39 (0.10)				8.14 (0.16)
<b><i>BO<sub>it</sub></i></b>			11.71*** (8.38)			12.02*** (8.45)
<b><i>ETA<sub>it</sub></i></b>				-0.11 (-0.72)		-0.19 (-0.79)
<b><i>MS<sub>it</sub></i></b>					-0.00 (-0.01)	-0,007 (-0.03)
<b>R<sup>2</sup></b>	0.0005	0.0003	0.2100	0.0010	0.0000	0.0210

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively, and ( ) is the value of t-statistic

The regression analysis using the SUR can be seen in Table 4 model of one to six explaining that the only variable operating costs are proxies by the ratio of operating expense to total assets that are detrimental to reflect the NOM of sharia banks in Indonesia in the period 2010-2017, the fourth hypothesis in this research is supported. The results of this study indicate that there is a positive relationship between operating costs and NOM, which means higher operating costs that are owned by the higher-level ICB NOM. The results of this study indicate that the ICB in Indonesia in setting the level of the margin depends on the level of operation efficiency, where high operating costs reflect the low level of efficiency ICB. This is in line with the Maudos and De Guevara (2004) opinion, as they used a multi-output framework in establishing a logical connection between the operational costs of the margin of the banking institutions. Their result confirmed that in the absence of market forces and all types of risks, the banks had to close their operational costs, which is a function of the operating costs of funds raised and the financing provided by the banks.

Based on published reports of financial ICB, operating costs are high on the ICB during the study period due to the decline in asset quality, so ICB needs to prepare larger allowance for Impairment Losses larger (SPS, 2017) due to the increase in operating costs that trigger NOM increase among ICB. Besides, the quantity and quality of human resources (HR) are inadequate, and information technology (IT) that has not been able to support the

development of financial products and services of ICB in Indonesia due to high labour costs. This can be an obstacle for considering ICB in Indonesia as a new industry and is still in the growth stage, so as to meet the quality and capacity of human resources and IT is becoming a challenge for the ICB to comprehend and implement in accordance with Islamic principles. Therefore, not yet adopted the inability ICB reliable IT systems, ICB requires several branch offices in order to facilitate and improve access to and use of Islamic financial products to the general public and thus require more labor, and is followed by an increase in operating costs.

#### **4.1 Endogenous Switching Regression Result**

Endogenous Switching Regression (ESR) is an implementation of the Full Information Maximum Likelihood (FIML) method where the method simultaneously estimates the binary and continuous equations of the model to produce a consistent standard error. In this model, the switching function is a model with endogenous displacement that can be performed on one equation at a time. The estimation results of endogenous switching regression in this study can be observed in table 5 and table 6 to answer the sixth to the tenth hypothesis.

In this test, it is found that there is a difference in the sensitivity of financing risk proxied by non-performing finance (NPF) to NOM of ICB when diversifying high income and diversifying high assets so that the sixth hypothesis of this study is supported. These results can be observed in the coefficient value of the NPF variable, which has a higher and more significant coefficient value in the regime of high-income diversification and low asset diversification. The results of this study indicate that Islamic commercial banks that have high-income diversification and low asset diversification tend to be more sensitive to fluctuations in financing risk than Islamic commercial banks that have high asset diversification and low-income diversification. The negative relationship between financing risk and NOM of ICB in the high-income diversification regime and low asset diversification means that when banks diversify high income and diversify assets are low, any increase in the risk of Islamic bank financing will be followed by a decrease in NOM.

**Table 5.** Estimation results using ESR when Islamic banks perform diversified income

Variables	Net Operating Margin function				Switching Function	
	Low degree of diversification		High degree of diversification		Coeff.	t-statistic
	Coeff.	t-statistic	Coeff.	t-statistic		
<b>Constant</b>	.3838487	0.57	2.21848	2.54 **	0.13423	0.33 **
<b><i>NPF<sub>it</sub></i></b>	-.13499	-1.47	-.21078	-2.46 **	-	-
<b><i>FDR<sub>it</sub></i></b>	-.007153	-1.10	.007499	1.16	-	-
<b><i>BO<sub>it</sub></i></b>	.504749	12.15 ***	0.2393	8.67 ***	-	-
<b><i>ETA<sub>it</sub></i></b>	-.011621	-0.59	-0.0313	-1.44	-	-
<b><i>MS<sub>it</sub></i></b>	.0339191	2.47 **	-0.0002	-0.02	-	-
<b><i>NFI<sub>it</sub></i></b>	.3838487	0.57	2.21848	2.54 **	0.1506	2.35 ***
<b><i>LTA<sub>it</sub></i></b>	-.13499	-1.47	-.21078	-2.46 **	-0.0043	-0.83
<b>Log likelihood. -763.30132 LR test. 20.50 ***</b>						
<b>Total no. of observation. 320</b>						

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively.

**Table 6.** Estimation results using ESR when Islamic banks perform diversified assets

Variables	Net Operating Margin function				Switching Function	
	Low degree of diversification		High degree of diversification		Coeff.	t-statistic
	Coeff.	t-statistic	Coeff.	t-statistic		
<b>Constant</b>	2165	2.28 **	1,528	2.05 **	7,083	8.94 ***
<b><i>NPF<sub>it</sub></i></b>	-0.2818	-2.64 ***	-0.1232	-1.17	-	-
<b><i>FDR<sub>it</sub></i></b>	0.00586	0.77	0.0023	0.37	-	-
<b><i>BO<sub>it</sub></i></b>	0.42940	11.61 ***	0.18937	6.07 ***	-	-
<b><i>ETA<sub>it</sub></i></b>	-0.0624	-2.30 **	-0.0218	-1.09	-	-
<b><i>MS<sub>it</sub></i></b>	-0.0090	-0.73	-0.0183	-1.56	-	-
<b><i>NFI<sub>it</sub></i></b>					0.1912	2.91
<b><i>LTA<sub>it</sub></i></b>					-0.0953	-9.38 ***
<b>Log likelihood. -720.39252 LR test. 10.47 **</b>						
<b>Total no. of observation. 320</b>						

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively.

## **4.2 Effect of diversification on the sensitivity of risk financing and net operating margin**

In the regime of the high level revenue and asset diversification is low, the NPF coefficient as a proxy of the financing risk has a significant negative coefficient on the NOM. The results support the sixth hypothesis research that says the NPF sensitivity towards different NOM when ICB diversified high income and high asset diversification. The results of this study can be interpreted that NOM can be more sensitive to fluctuations in financial risk when ICB diversified high income and low asset diversification. Based on these results, some possible arguments cause a significant negative relationship with NPF against NOM.

First, the negative relationship between NPF and NOM occurs when the ICB to diversify the assets are low, meaning that when the assets of Islamic banks focused on the conventional activities is the distribution of funding (financing), NOM can be more susceptible to fluctuations of financing risk, thus increasing the ratio of NPF cause NOM decrease Islamic commercial bank. Based on Islamic banking statistics published by the FSA in 2010-2017, product distribution of financing Islamic banks in Indonesia is still dominated by the Murabaha contract where the product has NPF ratio is higher than other financial products. As reflected in Islamic Banking Statistics (SPS) from 2010 to 2017, there was an increase of NPF ratio during 2014-2017 due to dominating the Islamic bank financing products based on Murabaha contract. The concentration of Islamic commercial bank financing products (diversification of assets less) causes a margin of Islamic banks more sensitive to fluctuations in financial risk that could potentially reduce the margin of Islamic banks.

Second, the results of this study support the research of Carbó-Valverde, Rodríguez-Fernández, and Udell (2009), which revealed that banks that diversify high income tend to have low margin levels. This can also occur because of the cross-subsidization strategy. Banks that diversify high in income can get high income from non-financing activities and hope to offer their traditional products with very small or even negative margins to maintain or attract customers, given the market share of Islamic banks is still smaller than conventional banks. So, under conditions of high financing risk, Islamic commercial banks can provide a low margin level when diversifying high income.

## **4.3 Effects of Diversification on The Sensitivity of Third Party Fund Market Share and Net Operating Margin**

In a regime with a low level of income diversification, the market share coefficient of third-party funds has a significantly positive coefficient on NOM. The results of this study

support the eighth hypothesis mentioning that the sensitivity of the market share of third-party funds to the NOM differs when ICB conducts low-income diversification and low asset diversification. The results of this study can be interpreted that NOM can be more sensitive to fluctuations in the market share of third-party funds when ICB diversifies into low income. Based on the results of these studies, several arguments lead to positive and significant market share relationships with NOM, especially when banks make low-income diversification.

First, the results of this study are in line with the market power theory that banks with a high level market share will have greater power to set high margins. These results can only be confirmed at a low level of income diversification. According to Nguyen (2012), banks with a larger market share both in financing distribution products and fund collection products will be more focused on traditional financial products than diversifying because they have been able to reap the benefits of their traditional activities.

Second, the results of this study are in line with the results of Trinugroho, Risfandy, and Ariefianto (2018), who found that Islamic banks with large market power are able to set high margins when diversification is low. Islamic banks that focus on one type of financing contract, such as Murabaha, will be directly affected by market competition. This finding can relate to the fact that Islamic bank competitors also use Murabaha financing contracts because the contract is the most popular one and has a lower level of risk than other contracts (Chong & Liu, 2009); (Khan, 2010); (Shaban et al., 2014)) Therefore, the contract of Murabaha financing on the loan market is a very competitive contract, and Islamic banks need to set their margins to follow the competitive conditions that exist in the market, thus building a positive relationship between the two.

#### **4.4 Effects of Diversification on The Sensitivity of Operational Costs and Net Operating Margin**

Operational costs (OC) have a positive relationship to net operating margin both when the ICB is in a regime of high and low levels of asset and income diversification. The results of this study support the ninth hypothesis of this study which states that BO sensitivity to NOM does not differ between ICB, which diversifies high income and high asset diversification. Compared to other variables, operating costs have the greatest impact on ICB margins. According to Maudos and De Guevara (2004), without market forces and all types of risks, banks must cover their operating costs, which are a function of third-party funds

collected and channeled. Diversification activities, both high and low on and bank income, tend to require costs and reduce the level of efficiency of Islamic banks.

In addition, ICB operating at a higher level of operating costs reflects a low level of cost efficiency, so that ICB in its intermediation services is still constrained by more expensive cost structures. Therefore, ICB tends to price these operational costs into its margins. On the other hand, despite having a low-efficiency level, diversifying assets and high income can increase the margin like general sharia. This finding supports the results of Saunders and Walter (1994)'s research, which found a negative effect caused by diversification activities in the form of increasing unit costs along with an increase in widespread activity. Diversification activities tend to increase ICB operating costs, so Islamic commercial banks operating at higher cost levels impose higher margins.

#### **4.5 Effects of Diversification on Capital Sensitivity and Net Operating Margin**

Capital has a significant negative relationship to NOM when in a low asset diversification regime. The results of this study do not support the tenth hypothesis of this study which states that capital sensitivity to NOM is different when ICB diversifies high income and high asset diversification. This result can be interpreted that the lower the level of equity capital owned by ICB will trigger an increase in ICB margins or any increase in ICB capital, it will trigger a decrease in ICB margins, especially in the low level of asset diversification. Several reasons can explain the significant negative relationship between the two.

First, the Financial Services Authority regulation No.11 / POJK.03 / 2016 concerning the obligation to provide minimum capital for commercial banks in order to increase the absorption of risks caused by crisis conditions and/or excessive bank credit growth, Islamic banks must meet the ratio. In order to protect stakeholders and meet the minimum capital requirements by the government, Islamic banks will tend to hold back funds or channel funds to investments that tend to be safe, such as government securities based on sharia principles in order to minimize large losses. Therefore, the bank will experience a decrease in margin due to holding its funds and reducing lending to the community, thereby reducing the opportunity for ICB to obtain a margin despite having a high level of capital.



**Table 7.** Results of endogenous switching regression estimate when Islamic commercial banks diversify income using bank size

Variables	Net Operating Margin function				Switching Function	
	Low degree of diversification		High degree of diversification		Coeff.	t-statistic
	Coeff.	t-statistic	Coeff.	t-statistic		
<b>Constant</b>	1.2758	0.7565	2.0966	2.44***	4.1820	2.39 **
<i>NPF<sub>it</sub></i>	-0.3118	-3.08	-0.2489	-2.91***	-	-
<i>FDR<sub>it</sub></i>	0.0020	0.30	0.0130	1.81	-	-
<i>BO<sub>it</sub></i>	0.5155	10.51***	0.2240	8.18***	-	-
<i>ETA<sub>it</sub></i>	-0.0486	-2.56	-0.0357	-1.62	-	-
<i>MS<sub>it</sub></i>	0.0257	1.40**	-0.0089	-0.73	-	-
<i>SIZE<sub>it</sub></i>					0.2648	2.33 **
<b>Log likelihood. -743.61LR test. 22.42 ***</b>						
<b>Total no. of observation. 320</b>						

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively.

**Table 8.** Results of endogenous switching regression estimates when Islamic commercial banks diversify assets using bank size

Variables	Net Operating Margin function				Switching Function	
	Low degree of diversification		High degree of diversification		Coeff.	t-statistic
	Coeff.	t-statistic	Coeff.	t-statistic		
<b>Constant</b>	2.18974	2.27**	2.05994	2.46**	8.58609	8.50***
<i>NPF<sub>it</sub></i>	-0.2991	-2.91***	-0.2842	-2.66		
<i>FDR<sub>it</sub></i>	0.0062	0.83	0.0003	0.06		
<i>BO<sub>it</sub></i>	0.4330	11.76***	0.25143	7.39***		
<i>ETA<sub>it</sub></i>	-0.0662	-2.56**	-0.4647	-2.24		
<i>MS<sub>it</sub></i>	-0.0941	-0.76	-0.1615	-1.09		
<i>SIZE<sub>it</sub></i>					-0.009	-0.23**
<b>Log likelihood. 711.831 LR test. 15.52 ***</b>						
<b>Total no. of observation. 320</b>						

Note: \*\* and \*\*\* denote significance at 5% and 1% levels, respectively.

Based on the size of the bank on the switching function Tables 7 and 8, the coefficient on the size variable has a significant positive coefficient when the bank diversifies income and has a significant negative coefficient when the bank diversifies assets, but the sensitivity of the NOM determinant to NOM shows unchanged results. Therefore, with every increase in the size ratio, Islamic commercial banks have a high probability of diversifying high income rather than diversifying high assets. This can occur because the average size of Islamic commercial banks is still small, and difficult to achieve a strong foothold in fee-based income-based activities.

Another reason that could support this finding could be that small-sized Islamic commercial banks may only have more expertise in traditional activities but have little expertise and experience in non-traditional activities ((Laeven & Levine, 2007)). In addition, small-sized ICB on average has low quality and capacity in HR and information technology systems, while diversifying non-traditional activities requires high quality and capacity both from the HR side and the information technology system, thereby reducing interest Small-sized ICB to carry out diversified activities in non-traditional activities. In addition, larger Islamic commercial banks have better risk management than smaller banks, so that they have a greater opportunity to diversify compared to small banks.

## **5. Conclusions and Policy Implications**

In this study, researchers expanded the research of Lin et al. (2012) using a sample of Islamic Commercial Banks operating in Indonesia in 2010-2017 and providing a detailed description of the benefits of diversifying assets and diversifying income. The researcher used the endogenous switching regression model with the classification of two regimes to categorize Islamic banks into regimes with high and low diversification levels. The results of this study indicated that overall, banks that are in a high asset diversification regime tend to be less sensitive to the fluctuations in the determinants of a NOM than banks that do focus strategies, thus providing benefits from conducting diversified activities.

The results of this study also indicated that operating costs are by far the most important determinant of the margins of sharia commercial banks in Indonesia. Diversifying assets and income both tend to reduce the level of efficiency of Islamic banking in Indonesia. Researchers also found that large-sized Islamic commercial banks have a high probability of diversifying high income compared to small-sized banks.

The attain successful achievement, diversification strategies cannot be generalized to all companies, but there are certain conditions and specific differences in financial

institutions that can support a successful strategy in a financial institution. However, it may not be applicable to other financial institutions. The following are some main implications:

First, the results of this study provide information that Islamic commercial banks in Indonesia are still less efficient in setting their margins, where the high operational costs tend to cause Islamic commercial banks to set high margins, which could potentially reduce economic activities counterproductive. Therefore, the management of Islamic commercial banks needs to improve efficiency in their operational activities and exercise better control of bank risk management.

Second, diversification of low or concentrated ICB assets against loans tends to increase NOM sensitivity to fluctuations in NOM determinants, especially in financing risks, operational costs and capital. If ICB aims to improve asset quality and maintain its capital adequacy level, ICB management needs to carry out a diversification strategy on its assets compared to focusing strategies.

Third, the results of this study can be used as a reference for policymakers, especially the government if they want to build the ideal NOM ratio for the Islamic banking industry by establishing regulations related to the level of efficiency of Islamic banking in conducting financial intermediation activities, especially when conducting high-income diversification activities and strategies focus on financing.

This study has several limitations stated as the following: this research included only Islamic commercial banks in Indonesia within 2010-2017 research period due to availability of data; thus, future research agenda can add a larger scope of research timeline in order to capture the better effect of diversification. Next, this study also only focuses on the company's internal variables so that future researchers can use external variables to enrich the diversification effect. This study uses the technique of the endogenous switching regression analysis to analyze the role of income diversification and asset diversification on the sensitivity of the determinant of the Net Operating Margin of Islamic Commercial Banks in Indonesia. Extensions of our paper could include applying the approaches use in our paper to other important issues. Readers may refer to Alghalith, et al. (2021) and Moslehpour, et al. (2021) for more information on the important issues that the approaches used in our paper to be applied.

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