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The Determinants of Financial Performance in Indonesian Banking Industry : Testing Interaction Effect of Size

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Abstract. *This research was made to examine the determinants of financial performance of banking companies in Indonesia. There are four independent variables (board of diversity, net interest margin, operational efficiency, and liquidity risk) and a moderating variable (firm size) have been analyzed in this research. Testing the interaction effect of firm size in explaining the influence of these four independent variables on banking financial performance is still very limited. This quantitative research was analyzed by using secondary data from audited annual reports of the company. The purposive sampling technique was used to choose the research's samples during the observation periods (2018-2022) and obtained 200 observations (40 samples over 5 years of research). Panel data regression with the EViews program was used to test the eight hypotheses which was developed in this research. The results of the Chow test and Hausman test confirm the use of the Random Effect Model in the analysis. The findings from testing the interaction model show that firm size does not moderate the influence of board of diversity and net interest margin on financial performance, while for operational efficiency and liquidity risk variables, the firm size shows a pure moderating role for the both.*

Keywords: *Board of Diversity, BOPO, Financial Performance, Firm Size, LDR*

1. INTRODUCTION

According to UU No. 10 Tahun 1998, banks are business entities that collect funds from the public in the form of savings and distribute them to the public through the credit or other forms to improve the standard of living of many people. In this case, the bank is an institution that has a function as a financial intermediary between parties who have excess funds and who lack funds. The function of banks as intermediary institutions makes banks have a strategic position in the economy with the activities to collecting funds from the community and distributing funds to people in need and then it will increase the flow of funds for investment, working capital or consumption, and therefore it will improve the national economy.

One of the company's goals is to maximize profits. In the case of maximize profits, a company needs to have a good performance in running its business. Performance measurement is a measurement that determines a company's qualifications and efficiency in business operations during the accounting period (Budiasni et al., 2020). The company's financial performance is closely related to the company's profitability. According to Syofyan (2002), bank performance can be measured by using the company's level of profitability. The better financial performances, the more attractive it belongs to the

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investors. If many investors likely to invest their shares, then the share price will increase. The increase of the share prices will hit up the firm value. In this research, the author uses the Return on Assets ratio as an indicator to measure bank profitability.

Company performance is greatly influenced by the ability of the board of directors to carry out the good corporate governance. The board of directors is a core of corporate governance mechanism that helps reduce conflicts of interest between managers and owners and also plays a role in developing the company strategy and facilitating the company's access to several resources such as finance and technology (Garanina & Muravyev, 2021).

The board of diversity has been one of the most critical issues related to board effectiveness and its impact on corporate performance for many years ago. Based on Morgan Stanley Investment Management study report in 2022 which is covering more than 800 large-cap companies in America, England, Canada, and Australia, reveals that companies with more diverse boards tend to increase share prices because they are perceived as having good governance that encourages inclusion for people and the long-term value creation of the company. Gender diversity in the board of company becomes economically important because when looking at gender differences, there are differences in individual preferences and backgrounds as well as individual characteristics. Psychological studies find substantial differences between men and women in values and risk preferences (Garanina & Muravyev, 2021).

According to the regulation of Bank Indonesia, Net Interest Margin (NIM) can be measured by the difference between total funding and lending interest rates or the difference between total funding expenses and total loan income rate (Mawardi, 2005). A higher Net Interest Margin (NIM) will increase interest income from the bank's productive assets which is managed by the bank then finally boosting the profitability. The Banking financial performance is an illustration of the level of success which is how far can the bank achieves in its operational activities. The financial performance of banking sector that listed in Indonesian Stock Exchange is crucial to monitor as because it influences the firm value creation (Rahayu, 2020).

Banking performance is closely related to a bank's efficiency in managing its operations. The bank is responsible for maintaining their stability, growth, and profits, so the bank can operate effectively. According to Mawardi (2005), there is an approach to measuring the bank efficiency which is called as Operational Cost to Operational Income Ratio (BOPO). This ratio measures the ability of bank management to control operational

costs relative to operational income. The smaller this ratio, the more efficient the bank is in controlling its operating costs. Achieveng efficiency in banking industry, especially in cost efficiency, it will leads to optimal profit levels, more competitive costs, and better customer services.

Loan to Deposit Ratio (LDR) is used to measured the bank's ability to pay its liabilities and repay its depositors and fulfill the credit requests that have been submitted. Loan to Deposit Ratio (LDR) is the ratio between total amount of credit provided and third-party funds. The amount of credit disbursed will directly impacts the bank's profit. If the bank is unable to distribute the loan optimally while having a substantial amount of collected third-party funds, it will incur losses and reduce the bank's profitability (Kasmir, 2017). Loan to Deposit Ratio (LDR) should be lower than the bank's Capital Adequacy Ratio (CAR) because it affects the liquidity.

According to Ayem and Harjanta (2018), firm size indicates the stability and ability of a company to carry out its economic activities. Firm size is defined as a scale that classifies the size of the company based on total assets, number of sales, and market capitalization. The total asset value reflects the amount of capital invested, while the number of sales indicates the company's cash turnover. A larger market capitalization will give a signal to investors that the company is well-known to the public. Market capitalization is the value of a company based on the total value of its outstanding shares and the stock price. Therefore, the success or failure for the listed company is influenced by the growth of their market capitalization (Aghnitama et al., 2021).

The author recognizes that there is still limited research on the influence of gender diversity on the board of directors and the bank health ratios on banking financial performance in Indonesia with firm size as a moderating variable. Thus, the author is interested in researching the impact of board of diversity, net interest margin, operational efficiency, and liquidity risk on the financial performance of banking companies in Indonesia.

2. LITERATURE REVIEW

Financial Performance

In order for a company to be highly competitive, it must be able to improve its performance and have strong management capabilities. Company performance assessment is used to determine management performance and whether it has achieved the goal of maximizing firm value for the owners. Profitability analysis is traditionally the first

category in performance measurement. Company value will increase if the company's profitability exceeds the cost of capital that used by the company (Rahayu, 2020).

Company management is required to achieve the targets set for a company in order to accelerate its profitability and efficiency levels (Kasmir, 2017). In case management need to measure the company's ability to generate profits, management can use profitability ratio as a proxy for the measurement. Profitability is a variabel used to measure bank profits, employs with Return on Assets (ROA) for measurement purposes (Kusuma et al., 2021; Wisudanto & Fikri, 2023).

Board of Diversity on Financial Performance

a. Agency Theory

The monitoring function on boards is often described as control, has attract the attention of corporate governance researches across various disciplines for several years (Hillman & Dalziel, 2003). The theoretical foundation for the board's monitoring role stems from the agency theory, which is delineates the potential conflicts because of the separation of ownership and control within an organization (Fama & Jensen, 2019). Theorists conclude that the main role of the board is to monitor the actions of agent (management) to keep the interests of principal or owner (Jensen & Meckling, 1976).

Board monitoring is crucial due to the potential costs that arise when management pursues its interests over the shareholder, thus creating agency costs (Hillman & Dalziel, 2003). Monitoring by the board of directors can mitigate the agency cost which is associated with the separation of ownership and monitoring control, consequently enhancing firm performance. Ararat et al. (2015) suggested that diversity can enhance monitoring by preventing the group stereotype and fostering critical inquiry, leading to build decisions that can improve financial performance. According to Jensen and Meckling (1976), agency costs can be divided into monitoring costs, bonding costs, and residual losses.

Board diversity is a crucial aspect of good corporate governance mechanisms that has received extensive attention in research. Specifically, women and ethnic minorities on boards of directors are the two most studied mechanisms (Adams & Ferreira, 2009). A female director possesses more advantages than the men, including a caring nature towards employees, keen business intuition, and meticulousness in analyzing the business impacts and risks of various decision options. Those advantages is believed to counterbalance the leadership style of men, who may be less concerned about risk and

may encourage diversity of viewpoints when overcome strategic issues (Thornton, 2017).

Empirical research confirms the relationship between board diversity and financial performance consistently support the idea that the presence of female directors positively and significantly influences a company's financial performance (Yahaya, 2019). This finding aligns with the research conducted by Hasnawati (2020); Wisudanto and Fikri (2023), indicating that board gender diversity has a positive and significant effect on a company's financial performance. In the other side, research by Hasnawati (2020); Wisudanto and Fikri (2023) suggests that gender diversity has a negative and significant influence on company financial performance. In contrast, according to Wirawan and Willim (2023), gender diversity on the boards has no effect on banking financial performance in Indonesia. Based on the theoretical concepts discussed, the author's hypothesis is consistent with the findings of Hasnawati, (2020); Wisudanto and Fikri (2023); Yahaya (2019).

H1: Board of Diversity has a positive and significant effect on banking financial performance.

b. Net Interest Margin on Financial Performance

The Net Interest Margin is a ratio that describes the level of profit obtained by a bank which is compared to the income received from its operational activities (Oktavianus, 2016). The assessment of the net interest margin ratio is derived from net interest income divided by average of productive assets. The strong growth in earning after tax was supported by a well going business activities in both the credit and collection.

The ability of management to generate net interest will influences the level of bank income from its total assets. Net interest is one of another components that form the profits or income because profit is a component that forms Return on Assets (ROA). Therefore, indirectly, if net interest income increases, then the profit was generated by the bank will also increase, thereby enhancing the bank's financial profitability (Rahmat et al., 2014).

The empirical results on this variable, according to Priharta et al. (2023); Surtikanti et al., (2022), suggest that net interest margin has a positive and significant effect on the company's financial performance. Meanwhile, Rahmat et al. (2014) found that net interest margin has a negative effect on the company's financial performance.

Based on the theoretical concepts that have been explained, the author's hypothesis is consistent with the research of Priharta et al. (2023); Surtikanti et al. (2022).

H2: Net Interest Margin has a positive and significant effect on banking financial performance.

c. Operational Efficiency on Financial Performance

Banks in carrying out their operational activities, they really need cost efficiency because it concerns the costs incurred and the amount of income received by the bank. Operational Costs to Operating Income (BOPO) is often called the efficiency ratio, which is used to measure bank management's ability to control operational costs relative to operational income. A bank can be categorized as efficient if the BOPO ratio is below 90 percent, because if it exceeds 90 percent or approaches 100 percent, the bank can be categorized as inefficient in carrying out its operations (Kasmir, 2017).

The empirical results of research on the relationship between BOPO and the financial performance, according to studies by Mawardi (2005); Pinasti et al. (2018); Puspitasari et al. (2021); Rahmat et al. (2014), indicate that BOPO has a negative and significant effect on banking financial performance in Indonesia. Meanwhile, research by Ikhsan et al. (2019); Sari and Fitri (2022) suggests that BOPO has no effect on the company's financial performance. Based on the theoretical concepts that have been explained, the author's hypothesis is consistent with the findings of Mawardi (2005); Pinasti et al. (2018); Puspitasari et al. (2021); Rahmat et al. (2014).

H3: Operational efficiency has a negative and significant effect on banking financial performance.

d. Liquidity Risk on Financial Performance

According to Kasmir (2017), the liquidity ratio is defined as a ratio that measures a bank's ability to fulfill its short-term liabilities, such as repaying the depositor’s funds when requested and meeting the credit requests that have been submitted. The bank's ability to honor withdrawals that made by customers relies on the credit deposited by debtors as a source of liquidity for the bank. Based on Regulation of Bank Indonesia No. 17/11/PBI/2015 on June 2015, the minimum Loan to Deposit Ratio (LDR) allowed by Bank Indonesia is 78 percent for the minimum, while the maximum allowed is 92 percent.

The Loan to Deposit Ratio (LDR) is a comparison between the total amount of credit or loans provided by the bank and the funds or deposits received from the customer. Empirical results of research on the relationship between the Loan to Deposit

Ratio (LDR) and financial performance, according to Dewi et al. (2016), show that LDR has no effect on banking financial performance in Indonesia. However, this differs from research conducted by Sari and Fitri, (2022); Tahu et al. (2023), which indicates that LDR has a positive and significant effect on the financial performance of banking company in Indonesia. Based on the theoretical concepts that have been explained, the author's hypothesis is consistent with the findings of Sari and Fitri (2022); Tahu et al. (2023).

H4: Loan to Deposit Ratio has a positive and significant effect on banking financial performance.

e. The Interaction Effect of Firm Size on Financial Performance

In this research, firm size is being set as a moderating variable because a larger company size tends to strengthen profitability and enhance firm value. Research by Vijaykumar and Sridevi (2018) shows that company size is an important factor to influence the profitability and firm value. Profitability will robust when firm size and a good financial performance play a role. Firm size is generally categorized into three scales such as large, medium, and small scales based on total assets, number of sales, market capitalization, and number of employee (Widiastari & Yasa, 2018).

According to Rajan and Zingales (2009), suggest that as the scale of a company increases, its profitability also increases, but at a certain point of scale, the firm size can decrease the company's profits. The larger the total assets, the higher the profit growth of the company tends to achieve. In this research to measure the firm size, the author uses the market capitalization as the proxy, due to the limited use of this proxy to measure firm size. According to the research by Doğan (2013); Suliyanti and Damayanti (2022), suggest that firm size has a positive and significant effect on financial performance, whereas research from Juniarti and Hariyanto (2014); Singla (2011) argue that the firm size negatively affects the financial performance. Based on the theoretical concepts presented, the author's hypothesis is consistent with the findings of Doğan (2013); Suliyanti and Damayanti (2022).

H5a: The firm size strengthen the relationship of board of diversity and financial performance.

H5b: The firm size strengthen the relationship of net interest margin and financial performance.

H5c: The firm size weaken the relationship of operational efficiency and financial performance.

H5d: The firm size strengthen the relationship of risk liquidity and financial performance.

3. RESEARCH METHODS

Population and Sample

The research is a quantitative model and uses the secondary data as its source. The data in this research is based on panel data which is sourced from company's financial statement or annual reports. The annual reports can be searched on www.idx.co.id or the company's official website. This research uses purposive sampling method to selecting samples with criteria: (1) Issuers are from banking sectors that listed before 2017. (2) The observation period during 2018 until 2022. The sample selection criteria can be formulated as follows:

Table 1. Sample Selection

No.	Description	Total
1.	Banking Companies in Indonesian Stock Exchange 2023	47
2.	Banks are listed on Indonesian Stock Exchange after 2017	(7)
Total Sample		**40**
Total Observation		**200**

Variables and Measurement

Table 2. Operational Definition of Variables

No.	Variable	Definition	Indicator
1.	Financial performance (Y)	The variable is measured by the Return on Assets (ROA), which reflects the ability to optimize the use of total assets to generate profits (Swandayani & Kusumaningtias, 2012)	Earning after tax divided by total assets (Horne & Wachowicz, 2008)
2.	Board of diversity (X_1)	Board diversity encompasses various factors such as gender, age, experience, and other aspects that contribute to creating uniqueness within the board. (Mishra & Jhunjhunwala, 2013)	1= at least one female director 0= there are no female director (Li & Chen, 2018)
3.	Net interest margin (X_2)	Ability to manage productive assets in order to generate net interest income (Oktavianus, 2016)	Net interest income divided by total productive assets (Oktavianus, 2016)
4.	Operational efficiency (X_3)	The variable can be measured by comparing total operational expenses against total operational income (Mawardi, 2005)	Operational expenses divided by operational income (Mawardi, 2005)

5.	Risk liquidity (X_4)	The variable is measured by Loan to Deposit Ratio, which compares the amount of loan disbursed to the deposits held (Oktavianus, 2016)	Total loan divided by total third-parties fund (Oktavianus, 2016).
6.	Firm size (M)	The company's scale is based on the size of total assets, total sales, and market capitalization (Widiastari & Yasa, 2018)	The natural logarithm of market capitalization (Aghnitama et al., 2021)

Data Processing Techniques

In this research used EViews software version 13 for data processing. Data panel with ordinary least square approach included heteroscedasticity and multicolinearity assumption tests because panel data comprise both time series and cross-section data. In the other hand, data panel with generalized least square approach doesn't need to do assumption test. Before running the moderated regression analysis test, there are some panel data regression models including the Chow test, Hausman test, and Lagrange Multiplier and finally testing the hypotheses.

Estimation Model and Selection Method

Regression that uses panel data is called panel data regression. The advantage of using panel data, which is a data combination of time series and cross-sectional data, it is able to provide more data and resulting in greater degrees of freedom (Widarjono, 2018). There are several methods for estimating panel data regression models such as the Common Effect, Fixed Effect, and Random Effect Model.

The Common Effect Model is an approach that does not account for individual or time dimensions. It assumes that the behavior of data among companies remains the same across various time periods. The Fixed Effect Model assumes there are differences in intercepts among companies, but these intercepts remain constant over time and therefore, panel data estimation techniques use dummy variables to capture differences in intercepts. Meanwhile, the Random Effect Model is a method for addressing disturbances or error terms that are correlated over time and among individuals (Widarjono, 2018).

Moderated Regression Analysis

This research employs the Generalized Least Squares (GLS) approach. According to Gujarati and Porter (2009), GLS is an equation that fulfills classical assumptions. In EViews, the GLS estimation model is only available within the random effects model. Based on the conducted model selection, the random effects model is the most suitable

recommendation for this research, so this research doesn't need to do the classical assumption testing.

This research is using a moderating variable, thus employing the panel data regression for the moderating variable as known as Moderated Regression Analysis (MRA). According to Ghozali (2011), moderated regression analysis is a specialized application of multiple linear regression, wherein the regression incorporates interaction terms, such as the multiplication of two or more independent variables. In this study, the moderating variable is firm size.

The relationship between the board of diversity, net interest margin, operational efficiency, and liquidity risk on banking financial performance in this research should be moderated by the size of the company. Therefore, the panel data regression to be tested in this research is divided into three models and formulated as follows:

$FP_{it} = \alpha_0 + \beta_1.BOD_{it} + \beta_2.NIM_{it} + \beta_3.BPO_{it} + \beta_4.LDR_{it} + \varepsilon_{it}$ ……..……...….. Model (1)

$FP_{it} = \alpha_5 + \beta_6.SZE_{it} + \varepsilon_{it}$ ……..……... Model (2)

$FP_{it} = \alpha_7 + \beta_8.BOD_{it} + \beta_9.NIM_{it} + \beta_{10}.BPO_{it} + \beta_{11}.LDR_{it} + \beta_{12}.SZE_{it} + \beta_{13}.BOD*SZE_{it} + \beta_{14}.NIM*SZE_{it} + \beta_{15}.BPO*SZE_{it} + \beta_{16}.LDR*SZE_{it} + \varepsilon_{it}$ ……..…….. Model (3)

Information:

FP = Financial performance

BOD = Board of diversity

NIM = Net interest margin

BPO = Operational cost to operational income

LDR = Loan to deposit ratio

SZE = Natural logarithm of market capitalization

α = Constant

β_1- β_{16} = Regression coefficient

ε_{it} = Residual

Hypothesis Testing

a. Coefficient of Determination Test

Testing the coefficient of determination aims to measure how well the independent variable can explain the dependent variable. The higher the coefficient of determination, the greater the proportion of the dependent variable that can be explained by the independent variable. In the other hand, the lower the coefficient of

determination, the smaller the proportion of the dependent variable that can be explained by the independent variable (Rinnaya et al., 2016).

b. Goodness of Fit (F-Test)

The F statistical test essentially shows whether all the independent variables included in the model simultaneously influence the dependent variable. The method used is to examine the level of significance or the probability. If the significance value is less than 0.05, then the independent variables will have a significant simultaneous effect on the dependent variable (Ghozali, 2011). This kind of method is used to check the goodness of fit of the model in the research.

c. Hypothesis T-test

According Ghozali (2011), the t-test essentially shows about how far an independent variable individually or partially explains the dependent variable. A t-test is an inferential statistic used to determine if there is a significant difference between the means of the variables and how they are related. The t-test is a test used for hypothesis testing in statistics with the t-distribution value and the degrees of freedom to determine statistical significance. By using the formula, values are calculated and compares against the standard values and take the result whether assumed null or alternate hypothesis is accepted or rejected. In this study, the t-test for the regression results was conducted with a degree of freedom of 95 percent, or a significance level of 0.05.

4. RESULTS AND DISCUSSIONS

Table 3. Descriptive Analysis

	BOD	**NIM**	**BPO**	**LDR**	**SZE**	**ROA**
Mean	0,6800	0,0428	0,9562	0,8545	29,8927	0,0030
Median	1,0000	0,0441	0,8943	0,8428	29,7409	0,0065
Maximum	1,0000	0,1383	2,8786	1,6319	34,5914	0,0474
Minimum	0,0000	-0,0352	0,4292	0,1235	26,1257	-0,1589
Std. Dev.	0,4677	0,0209	0,3678	0,2399	1,7275	0,0277
Sum	136,0000	8,5527	191,2351	170,9065	5978,530	0,6029
Observations	200	200	200	200	200	200

From Table 3, it is known that the total data in these observations are consist of 200 datasets. The variable Y is proxied by Return on Assets (ROA) has a mean value of 0,0030 with a standard deviation of 0,0277. This phenomenon indicates various data variations. The variable X1 (BOD) has a mean value of 0,6800 with a standard deviation of 0,4677 and indicating no variation in data distribution. The variable X2 (NIM) has a mean value of 0,0428 with a standard deviation of 0,0209 and indicating no variation in data distribution. The variable X3 (BOPO) has a mean value of 0,9562 with a standard deviation of 0,3678 and indicating no variation in data distribution. The variable X4 (LDR) has a mean value of 0,8545 with a standard deviation of 0,2399 and indicating no variation in data distribution. The firm size as moderating variable (SZE) has a mean value of 29,8927 with a standard deviation of 1,7275 and indicating no variation in data distribution.

The Estimation Model

Table 4. Estimation Model Results

Chow Test		**Hausman Test**		**Lagrange Multiplier Test**	
Effects Test	Prob.	Text Summary	Prob.	Test Hypothesis (Breusch-Pagan)	
Cross-section F	0,0000	Cross-section random	0,0817	Cross-section	55,11362
Cross-section Chi-square	0,0000			Prob.	(0,0000)

The Chow Test results in Table 4 show that the Cross-section F and Cross-section Chi-square probability values are 0,0000 lower than standard probability 0,05. Therefore, it can be concluded that the CEM model is rejected and the FEM model is accepted. The Hausman Test results show that the random cross-section probability value is 0,0817 higher than standar probability 0,05. Thus, in this test, the FEM model is rejected and the REM model is accepted. Lagrange Multiplier Test results show the Breusch-Pagan value is 0,0000 lower than standar probability 0,05. Consequently, the CEM model is rejected and the REM model is accepted. Therefore, it can be concluded from the three estimation models above, the best model in this research is the Random Effect.

Regression Test Result

Table 5. Regression Test Result

Variable	**Model 1**	**Model 2**	**Model 3**
Constant *Std. Error* Probability	0,0633 (0,0042) 0,0000***	-0,0796 (0,0421) 0,0602*	0,1749 (0,0789) 0,0279**
BOD *Std. Error*	0,0007 (0,0018)		-0,0311 (0,0347)

Probability	0,6818		0,3724
NIM	-0,0181		-0,2529
Std. Error	(0,0396)		(0,8354)
Probability	0,6472		0,7624
BPO	-0,0718		0,0212
Std. Error	(0,0019)		(0,0380)
Probability	0,0000***		0,5768
LDR	0,0100		-0,1759
Std. Error	(0,0033)		(0,0675)
Probability	0,0026***		0,0098***
SZE		0,0028	-0,0038
Std. Error		(0,0014)	(0,0027)
Probability		0,0506**	0,1502
BOD*SZE			0,0011
Std. Error			(0,0018)
Probability			0,3663
NIM*SZE			0,0080
Std. Error			(0,0282)
Probability			0,7780
BPO*SZE			-0,0031
Std. Error			(0,0013)
Probability			0,0159**
LDR*SZE			0,0062
Std. Error			(0,0023)
Probability			0,0062***
R^2	0,8860	0,0189	0,8937
Adjusted R^2	0,8836	0,0140	0,8886
F-Statistic	378,7270	3,8230	177,4131
Prob. F-Statistic	(0,0000)***	(0,0520)**	(0,0000)***

level of significance 1%*, 5%**, 10%**

The test results in Model 1 indicate that board of diversity and net interest margin have no effect on the financial performance of banking companies in Indonesia. However, operational efficiency (BOPO) has a negative effect, and liquidity risk (LDR) has a positive effect on financial performance, both variables have a significance level of 1 percent.

The test results in Model 2 show that company size, as a moderating variable has a positive and significant effect on the financial performance of banks in Indonesia, with a significance level of 5 percent. The larger the firm size, the greater the financial performance of banks in Indonesia.

After being moderated by firm size in Model 3, the interaction effect of board diversity and net interest margin shows no influence on the financial performance of banking companies in Indonesia. This findings for the effect of board of diversity and net interest margin does not support the alternate hypothesis of the research and aligns with studies by Adams and Ferreira (2009); Kusuma et al. (2021); Wirawan and Willim (2023),

which found that board of diversity does not influence on banking financial performance in Indonesia. It also aligns with (Rahmat et al., 2014) which found that net interest margin has no effect on banking financial performance.

However, unlike board diversity and net interest margin, the operational efficiency (BOPO) and liquidity risk (LDR) show a significant effect on banking financial performance after being moderated by firm size in Model 3, at significance levels of 5 percent and 1 percent, respectively. BOPO consistently has a negative and significant effect on banking financial performance, while LDR has a positive and significant effect.

This phenomenon indicates the firm size moderates these relationships by weakens the negative relationship between BOPO and ROA, as evidenced by decreased probability value and regression coefficient. This finding is consistent with studies by Mawardi (2005); Pinasti, et al. (2018); Puspitasari et al. (2021); Rahmat et al. (2014), which is also found a negative and significant effect of BOPO on financial performance.

Conversely, the moderating effect of firm size strengthens the positive relationship between LDR and ROA, with an increased regression coefficient and a significance level of 1 percent. This aligns with research Sari and Fitri (2022); Tahu et al. (2023), which found that the LDR positively and significantly affects the financial performance. The findings from testing the interaction model, show that firm size does not moderate the influence of board of diversity and net interest margin on financial performance, while for operational efficiency and liquidity risk variables, the firm size shows a pure moderating role for the both.

Based on Table 5, the probability value (F-statistic) for the moderation interaction effect in Model 3 is below 5 percent. This result indicates that the inclusion of board diversity, net interest margin, operational efficiency, and liquidity risk on financial performance with the firm size as the moderating role are meet the criteria goodness of fit research model. The Adjusted R Square value in Model 1 was 88,36 percent, which increased to 88,86 percent after interaction effect in Model 3. This suggests that 88,86 percent of the variability in the financial performance of banking companies listed on Indonesian Stock Exchange can be explained by the variability in board diversity, net interest margin, operational efficiency, and liquidity risk while the remaining 11,14 percent is influenced by other factors has not include in the research.

The Effect of Board of Diversity on Financial Performance

The findings indicate that board of diversity has no effect on the banking financial performance, leading to the rejection of H1 and acceptance of H0. This suggests that the

board of directors has not optimally utilized all their abilities to improve the bank's performance. These results imply that board of diversity tends to reduce the banking financial performance. This finding is contradicting the findings of Ararat et al. (2015). The gender diversity on the boards can even lead to the loss because of conflict and miscommunication problems (Kusuma et al., 2021).

The gender diversity on the board of directors impact for the longer decision making process, further compounded by the annual rotation of directors. The different views and decision among board members ultimately fail to mitigate the negative impact of the slow decision making, beside of that phenomenon, market demands fast swift responses (Kusuma et al., 2021). These findings align with previous research by Adams and Ferreira (2009); Kusuma et al. (2021); Winata et al. (2018); Wirawan and Willim (2023).

Gender stereotyping can also impact company performance. Companies with female leader sometimes face negative market reactions. A heterogeneous board tends to generate more conflict and diverse opinions than a homogenous board of directors. The disproportionate percentage of female directors compared to male directors can become problematic issue. Research by Pasaribu et al. (2019), suggests that companies should have the minimum of two female directors. Companies that only have a single female director may encounter the problem called tokenism where the contribution of female directors are marginalized due to their minority status.

The Effect of Net Interest Margin on Financial Performance

The findings in this research indicate that the net interest margin has no effect on the banking financial performance. As the result to the hypothesis leading to the rejection of H2 and acceptance of H0. This is caused by the total average of banking companies as the samples in this research had just only 25 percent have a net interest income ratio above 5 percent. According to Bank Indonesia’s regulation No. 9/SEOJK.03/2020 said that if the net interest margin above 5 percent then it will indicate the bank can effectively manage their interest income from loan on its productive assets, thereby reducing the risk of their financial instability. A higher net interest margin signifies the bank is in a healthy condition. However, the average of net interest margin in this research samples is only 4 percent. Thus, indicate the banking sectors in Indonesia are still unable to maximize their interest income.

These findings are consistent with the research done by Sari et al. (2022) which states that there is no significant influence of net interest margin on a company's financial performance. Net interest income is the result of subtracting the interest income received

by the bank and interest expenses the banks given for customer deposits. The smaller the net interest margin, the lower the bank's performance and profitability.

The Effect of Operational Efficiency on Financial Performance

The findings indicate the level of operational efficiency (BOPO) in Indonesian banking sector has a negative and significant effect on financial performance. As the result to the hypothesis leading to the acceptance of H3 and rejection of H0. The BOPO ratio is used to measure the bank's operational efficiency level in managing its activities. According to Bank Indonesia's regulations, the standard limit for the BOPO ratio is between the range of 94 percent to 96 percent, therefore the bank can enhance their efficiency and boost bank profits. If look forward to the samples of BOPO in this research, the average of BOPO ratio is around 95 percent. This phenomenon suggests that the financial performance of the banking sector in Indonesia still remains in healthy condition. A lower BOPO ratio signifies a smaller operational costs relative to operational income, thereby it can increasing the operational profit and bank profitability.

The findings align with research by Mawardi (2005); Pinasti et al. (2018); Puspitasari et al. (2021); Rahmat et al. (2014), confirm that BOPO negatively and significantly influences on banking financial performance in Indonesia. This suggests that a higher BOPO ratio correlates with the lower financial performance of banks. If the BOPO ratio increases without a corresponding rise in operating income, or even if the BOPO surpasses the level of operating income, it will lead to a decline in earning before tax. A high in BOPO ratio will make inefficiency in operations, thereby reducing bank profitability. Therefore, banks should maintain a low BOPO ratio to enhance efficiency in their business activities and sustain their profitability.

The Effect of Risk Liquidity on Financial Performance

The findings indicate that the level of liquidity risk which is measured by the loan to deposit ratio (LDR) positively and significantly influences the banking financial performance in Indonesia. As the result, leading to the acceptance of H4 and rejection of H0. The LDR ratio measures the effectiveness of financing (loan) distributed by banks, so an increase in the LDR ratio corresponds to higher bank profits and improved company performance, assuming the bank has an effective financing. This finding suggests that banks can repay the fund withdrawals made by customers by relying on the bank credit performance as a source of liquidity. The average of LDR ratio of the samples in this research is only 85 percent. Consequently, the banking sector in Indonesia is still

categorized in a healthy condition when compared with government rules with a standar minimum limit at 78 percent and maximum limit at 92 percent for the LDR ratio.

The results of this research are supported by findings from other studies Sari and Fitri (2022); Tahu et al. (2023), which state that LDR has a positive and significant effect on banking financial performance in Indonesia. These results indicate that banks in Indonesia have distributed their financing effectively. As banks distribute more financing to those in need, their profitability increases due to higher loan interest income, which in turn on an increase of return on assets.

5. CONCLUSION AND RECOMMENDATIONS

This research aims to determine the effects of Board Diversity, Net Interest Margin, Operational Efficiency, and Liquidity Risk on the financial performance of banking companies listed on the Indonesian Stock Exchange with the firm size as a moderating variable. Based on the test results and research discussion, it can be concluded that board of diversity and net interest margin have no effect on the company's financial performance. Meanwhile, Operational Efficiency (BOPO) has a negative and significant effect on the company's financial performance, and Liquidity Risk (LDR) has a positive and significant effect on the company's financial performance.

The limitation of this research is only observes the banking sector over a limited period (2018-2022). The variables involved in the research model are also limited to board of diversity, net interest margin, operational efficiency, and liquidity risk. Financial literature shows that many determinants can influence banking financial performance. Additionally, this research does not differentiate the banking classifications based on their asset values.

For the future research can address some of these limitations to obtain more comprehensive results. The separation of banking assets can be implemented based on the Bank Indonesia’s regulations whether small or large asset values. Additionally, financial performance measurement can be further elaborated by including other variables that have not been analyzed in this research. Furthermore, regarding to the research period, future studies could consider to add the analysis period beyond five years.

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