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FIRM SIZE AS A MODERATOR: CAR, FDR, AND OEOI ON ROA

Jafria Vinori[1)*] , Tiara Juliana Jaya[2)]
[12] Islamic Banking Study Program, Faculty of Economics, UIN Maulana Malik Ibrahim Malang
Email Correspondence[1)*] : jafriaaa03@gmail.com

Abstract

This research aims to examine Islamic commercial banks in Indonesia to find out how firm size moderates the relationship between ROA and CAR, FDR, and OEOI. Thirteen Islamic commercial banks make up the study's population. Eight Islamic banks in Indonesia made up the sample, which was obtained by purposive sampling. The data used is secondary data culled from the 2017–2023 annual financial statements made available online by each Islamic bank. In this research, Eviews 10 is used to analyze panel data using multiple regression analysis and an interaction test called Moderated Regression Analysis. According to the study's findings, ROA is significantly impacted positively by CAR and FDR, and negatively by OEOI. The impact of CAR and OEOI on ROA may be mitigated by larger firms, whereas the effect of FDR on ROA is unaffected by company size. Despite the fact that larger companies do tend to have stronger connections between financial performance indicators, operational efficiency, quality of financing, and risk management are still the most important elements in predicting profitability, according to this research. The research has a few flaws, such as a small sample size (eight institutions) and data coverage that doesn't reflect the whole Islamic banking market. Hence, to get a more complete picture, it would be wise to conduct further studies with larger samples, take other factors like risk management efficiency and finance diversification into account, and look at a broader variety of industries. The conclusion of this study emphasizes the importance of managing financial performance indicators such as CAR, FDR, OEOI and ROA and how much size influences financial performance indicators in Islamic Commercial Banks.

Keywords: *CAR, FDR, OEOI, ROA, Firm Size*

INTRODUCTION

Banks serve as important financial intermediary institutions in the economy, with operational sustainability highly dependent on public trust (Fajri, 2021; Jaya & Kholilah, 2020). An alternative to normal banks that adheres to Islamic principles has emerged: Islamic banks. This is due to the growing awareness among Muslims of the usury practiced by traditional banks. To address the investment requirements of Muslims and to combat usury, Islamic banks provide a profit-sharing system in lieu of interest (Alfakhirah & Jaya, 2024). Islamic banks in Indonesia have also grown substantially, even though their customers still have a hard time distinguishing between conventional and Islamic banking products. The branch networks, assets, and funding of Islamic banks in Indonesia are all showing signs of healthy expansion.

Islamic banks are for-profit businesses that must adhere to sharia law, which forbids riba, gharar, and maysir. Nugraha (2024); Soleh et al. (2022). In this context, Islamic banks seek profits through profit-sharing mechanisms and real asset-based transactions such as *murabaha*, *mudharabah*, and *musyarakah* (Farianti et al., 2020). The success of Islamic banks in achieving profitability goals greatly depends on effective risk management and a deep understanding of their customers (Himma & Jaya, 2024; Marisya, 2019). If Islamic financial institutions want to keep the public's faith and remain in business, they need to adhere to regulations laid forth by the Financial Services Authority (OJK). (Amin & Jaya, 2024; Utama, 2020). Return on Assets (ROA) is a measure of an Islamic bank's profitability in this research. It shows how profitable the bank is in relation to its total assets. Islamic banks are profit-driven, but they are also devoted to doing business ethically and in accordance with sharia law, which helps win over more customers and earn their confidence. (Abd Wahid, 2021).

However, not all Islamic banks in Indonesia experience positive growth trends. Some Islamic banks have reported significant profit declines in Q1 2024. PT Bank Muamalat Indonesia Tbk recorded a net profit decline of 72.7% year-on-year to IDR 2.78 billion. PT Bank Panin Dubai Syariah Tbk decreased by 41% to IDR 35.51 billion, and PT Bank Mega Syariah fell by 35.98% to IDR 50.06 billion. The significance of investigating the monetary elements impacting operational efficiency and profitability is underscored by this reduction, which suggests significant difficulties in sustaining these metrics. The Capital Adequacy Ratio (CAR), the Financing to Deposit Ratio (FDR), and the Operating Expenses to Operating Income (OEOI) are a few of the variables that might affect ROA. (Maghfiroh et al., 2021).

Table 1
Data on CAR, BOPO, FDR, ROA, and Size of Islamic Banking in Indonesia (2017–2023)

Tahun	CAR	BOPO	FDR	ROA	Size
2017	20,4	92,8	83,4	0,1	18553,5
2018	22,1	87,5	85,5	2,4	18584,9
2019	22,5	86,9	88,8	2,5	18843,1
2020	28,4	88,2	100,0	1,6	19560,8
2021	29,7	108,9	79,8	0,6	22255,1
2022	29,1	82,7	79,4	2,3	23699,5
2023	27,6	99,1	82,0	0,8	25198,5

Source: Processed by the researcher (2025)

Table 1 shows the performance metrics of Islamic banks in Indonesia from 2017 to 2023. These indicators include ROA, bank size, operating expenses to operating income (BOPO), financing to deposit ratio (FDR), and capital adequacy ratio (CAR). During the seven-year span, CAR showed a steady upward trend, reaching a high of 29.7 percent in 2021 and then slightly falling to 27.6 percent in 2023, suggesting a solid financial situation. BOPO was quite variable, peaking at 108.9% in 2021 and indicating major operational inefficiencies in that year. FDR showed a volatile trend, with a high of 100.0% in 2020 and a decline thereafter, indicating adjustments in credit disbursement relative to deposits. ROA varied notably, peaking at 2.5% in 2019 but falling sharply to 0.6% in 2021 and only slightly recovering to 0.8% by 2023, reflecting unstable profitability. Meanwhile, bank size demonstrated steady growth throughout the period, signaling asset expansion in the Islamic banking sector. Although this figure is still considered healthy, the downward trend indicates the need for sustainable capital structure strengthening.

Islamic commercial banks' Return on Assets (ROA) is impacted by a number of factors. One of them is the Capital Adequacy Ratio (CAR), which measures the bank's capacity to absorb losses from risky assets relative to its owned capital. (Rofiah & Arief Arfiansyah, 2023). Return on Assets (ROA) is affected by many variables for Islamic commercial banks. The Capital Adequacy Ratio (CAR) is one such metric; it indicates the extent to which a bank can weather losses on risky assets in relation to the capital it actually has on hand. (Widyastuti & Aini, 2021). From 2017 to 2021, CAR for Islamic commercial banks rose to 29.7 percent, but by 2023, it had fallen to 27.6 percent.

Another factor that affects return on assets (ROA) is the financing to deposit ratio (FDR), which measures how well a bank uses its assets to fulfill credit demand. An indicator of a bank's efficiency is its FDR value; a higher FDR indicates more distribution of finance, which in turn increases profitability. (Susilawati & Ari, 2022). On the other hand, operational inefficiency could be indicated by FDR values that are too high or too low, which has a

detrimental impact on profitability. (Almunawwaroh & Marliana, 2018). In 2020, the greatest FDR for Islamic commercial banks was 100%; in 2022, it fell sharply to 79.4%; and in 2023, it improved little to 82.0%. Overly high or underly low FDR levels may point to operational inefficiencies and possible liquidity concerns.

Finally, Islamic banks must keep costs down. One way to do this is by looking at the Operating Expenses to Operating Income (OEOI) ratio, which shows how efficient the bank is and how well it can run its operations. A decline in the bank's ROA can be the result of a drop in profit before taxes caused by rising operational expenses. (Sitompul & Nasution, 2019). OEOI rose drastically from 11.886 in 2017 to 22.255 in 2023. This sharp increase indicates that operational costs have grown faster than income, which certainly hurts ROA. Under these conditions, cost efficiency becomes a major challenge for the sustainability of Islamic bank profitability.

"Previous research by Kurnia & Wahyudi (2022); Yuliana & Listari (2021)Showed that the Capital Adequacy Ratio (CAR) has a positive and significant effect on Return on Assets (ROA). Conversely, research by Almunawwaroh & Marliana(2018); Anisa & Anwar (2021) Found that CAR has a negative and significant effect on ROA. Regarding the Financing to Deposit Ratio (FDR), Maghfiroh et al. (2021); Regina (2024)Showed that FDR has a significant effect on ROA, while Solika & Annisa (2023)Reported a negative and significant effect of FDR on ROA. As for the Operating Expenses to Operating Income (OEOI) ratio, research by Maghfiroh et al. (2021); Regina (2024) Indicated that OEOI has a positive and significant effect on ROA, whereas Yuliana & Listari (2021) and Kurnia & Wahyudi (2022)Found a negative and significant effect of OEOI on ROA."

When it comes to Islamic banks, firm size is a key component that may optimize profitability. Return on Assets (ROA) may be higher for larger organizations due to their greater resources, access to more markets, and capacity to realize economies of scale. (Utomo, 2019). But there are downsides to becoming big, such more operating expenses and complicated management. This research examines the link between ROA, CAR, FDR, and OEOI, where company size is measured by the logarithm of total assets. company size acts as a moderating variable in this relationship. The correlation between financial measures and profitability is impacted by the notion of economies of scale, which states that bigger organizations are generally more efficient. (Utomo, 2019). Although studies on firm size as a moderating variable in Islamic banking are still limited compared to those in the manufacturing sector regarding its influence on innovation, operational efficiency, and market competitiveness Laoli & Herawaty (2019); Maharsi et al. (2017); Simajuntak & Anugerah (2018); Wati et al. (2019); Yudhistira et al., (2023), previous research has shown the potential of firm size to strengthen the relationship between liquidity and profitability Fatimatuzzahro & Utomo (2022) and to moderate the effect of capital structure on company performance (Santoso & Susilowati, 2019). To reach the pinnacle of operational efficiency and profitability in Islamic banking, a more thorough understanding of the moderating effect of company size is required.

Research on firm size as a moderating variable in Islamic banking remains limited compared to the manufacturing sector, which has extensively examined its impact on innovation, operational efficiency, and market competitiveness Laoli & Herawaty (2019); Maharsi et al. (2017); Simajuntak & Anugerah (2018); Wati et al. (2019); Yudhistira et al., (2023). Although relevant in moderating the relationship between key financial variables in Islamic banking, empirical studies are still rarely conducted. Previous studies have shown that bank size plays a role in optimizing resources and operational efficiency; however,

further research is needed to explore its role in financial stability and profitability in Islamic banking.

This study aims to examine the relationship between ROA, Firm Size as a moderator, and the CAR, FDR, and OEOI in Islamic banks. In order to get a better knowledge of the variables impacting the financial performance of Islamic banks in Indonesia, this research seeks to examine and identify these impacts, as well as investigate how firm size might improve or weaken the link between financial parameters and ROA.

RESEARCH METHODS

Type of Research

Throughout the research process, from data collection to analysis, this study relies on numerical data, with an emphasis on numerical computations and measurements to deduce the link between variables. (Dhewy, 2022)

Population and Sample

Any and all items that meet the researcher-specified requirements for a certain set of attributes make up the population. This study's population includes thirteen (2023) Islamic commercial banks that were registered with the Financial Services Authority (OJK). If you want to learn about a group, you need to choose some parts from the whole, and that's called a sample. Purposive sampling, in which samples are chosen with specific goals in mind, is the method used for this sampling. (Sugiyono, 2017). Sample criteria include:

1. Sharia Commercial Banks registered with the OJK in the period 2017-2023,
2. Have complete financial reports for the period,
3. Provide relevant data according to research needs.

Eight samples were used in this study using the purposive sampling method. The following is a list of samples in this study.

Table 2
Research Samples

No	Bank Name	Links
1.	Bank BCA Syariah	https://www.bcasyariah.co.id/
2.	Bank Muamalat Indonesia	https://www.bankmuamalat.co.id/
3.	Bank Panin Dubai Syariah	https://pdsb.co.id/
4.	Bank KB Bukopin Syariah	https://www.kbbanksyariah.co.id/
5.	Bank BTPN Syariah	https://www.btpnsyariah.com/
6.	Bank Aceh Syariah	https://bankaceh.co.id/
7.	Bank BPD Riau Kepri Syariah	https://www.brksyariah.co.id/
8.	Bank Jabar Banten Syariah	https://www.bjbsyariah.co.id/

Source: data processed by researchers, 2024

Data Collection Technique

Panel data, a hybrid of time series and cross-sectional data, was used in this research. The data was gathered yearly from 2017 to 2023. These numbers are secondary data, meaning they were culled from other, already-existing sources. (Sugiyono, 2017). In this case, researchers utilize financial reports published by Islamic banks on their websites to support further analysis and research.

Definition and Operational Research Variables

Research variables are characteristics that are described to conclude. The operationalization of variables is used as a guide in measuring variables, so that the quality of

measurement can be assessed. (Roflin & Liberty, 2021). This study uses three types of variables, namely independent variables (X) that do not affect other variables and act as factors causing change, consisting of CAR (X1), FDR (X2), and OEOI (X3) (Sugiyono, 2017) Specifically, ROA (Y) is an independent variable that affects the dependent variable Y. Furthermore, the connection between the independent and dependent variables might be influenced by a moderating variable (M), which in this case is firm size. (Sugiyono, 2017). The definition for each variable in this study is explained as follows:

1. Capital Adequacy Ratio (CAR)
   The capital adequacy ratio (CAR) measures a bank's resilience in the face of possible asset value drops caused by losses from exposure to risky assets, and it does this by looking at how much capital the bank has on hand. (Widyastuti and Aini, 2021)
2. Financing to Deposit Ratio (FDR)
   One way to gauge a bank's financial health and liquidity risk is by looking at its FDR, or financing to deposit ratio. (Amelia & Aprilianti, 2018)
3. Operating Expenses Operating Income (OEOI)
   The Running Costs A bank's operational income divided by its operating expenses is known as the operating income ratio (OEOI). This ratio is a way to evaluate the bank's operational efficiency and effectiveness. (Wahyuningtyas & Utami, 2021)
4. Return On Assets (ROA)
   An indication of a bank's profitability level is the Return on Assets (ROA) ratio. (Wahyuningtyas & Utami, 2021)
5. Firm Size
   Company Size is a company with large assets that has higher flexibility in managing its assets. From a managerial perspective, the ability to operate a company efficiently provides significant benefits in supporting the growth of the company's value (Rahayu & Sari, 2018)

Table 3
Operational Definition of Variables

Variables	Measurement	Scale
Capital Adequacy Ratio (CAR)	$CAR = Bank\ Capital \div Total\ ATMR\ x\ 100\%$	Ratio
Financing to Deposit Ratio (FDR)	$FDR = Credit\ Amount \div Third\ Party\ Funds\ \times 100\%$	Ratio
Operating Expenses Operating Income (OEOI)	$OEOI = Operating\ Expenses \div Operating\ Income\ \times 100\%$	Ratio
Return On Assets (ROA)	$ROA: Profit\ Before\ Tax \div Total\ Assets \times 100\%$	Ratio
Firm Size	Total Assets	Ratio

Source: data processed by researchers, 2024

Data Analysis Techniques

The findings provide the foundation for forming conclusions, which is why statistical data processing is crucial in research. To guarantee high accuracy, data analysis is required prior to making conclusions. Modified regression analysis, an interaction test, and multiple regression using a panel data approach make up the analytical procedure. Data that is both time-series and cross-sectional is known as panel data. Panel data may be either balanced, in which case all individuals have the same number of time units, or unbalanced, in which case

the numbers of time units vary. The research employs a balanced panel design since the number of time units for each person (business) remains constant. (Sugiyono, 2017).

The interaction test, also known as Moderated Regression Analysis (MRA), is a subset of multiple linear regression that takes into account the interplay of many independent variables. The purpose of a moderated regression analysis is to determine whether the independent and dependent variables may be strengthened or weakened by the moderating variable. (Zamzam & Suryaningprang, 2024). In this research, MRA is used to assess how the moderating variable, namely firm size, impacts the correlation between CAR, FDR, and OEOI and ROA.

RESULTS AND DISCUSSION

Research Result

Descriptive statistics are a description of the object of research using population or sample data, which is interpreted as a way to collect and present data that aims to obtain clearer and easier-to-understand information (Sulistiyo & Yuliana, 2019). The description can be in the form of average values, standard deviations, variants, *maximums, minimums, sums, ranges,* and *skewness* (distribution deviations) (Sugiyono, 2017). This study used multivariate regression analysis (MRA) to determine the effect of business size as a moderating variable on the relationship between CAR, FDR, OEOI, and ROA. (Sugiyono, 2017). Table 2 displays the following descriptive data as they pertain to the study:

Table 4
Descriptive Statistics

	CAR	FDR	BOPO	ROA	SIZE
Mean	25.66625	85.57607	92.30982	1.466607	9,691,786
Median	22.16500	86.27000	85.60000	1.170000	9,590,000
Maximum	58.27000	196.7300	217.4000	13.58000	1,111,000
Minimum	11.51000	38.33000	16.25000	-10.77000	8,560,000
Std. Dev.	11.05574	20.65429	34.35635	4.343991	0.710598
Sum	1437.310	4792.260	5169.350	82.13000	5,427,400
Sum Sq. Dev.	6722.611	23462.99	64919.73	1037.864	2,777,222
Observations	56	56	56	56	56

Source: data processed by researchers, 2024

Several noteworthy conclusions may be drawn from the descriptive statistics of Islamic commercial banks in Indonesia. Capital Adequacy Ratios (CARs) range from 11.51% in 2017 at Panin Dubai Syariah Bank to 58.27% in 2021 at BTPN Syariah Bank, with an average of 25.67% suggesting a solid capacity to absorb risk. If you look at the CAR distribution, you'll see that certain banks have very high capital ratios. While there are notable fluctuations, the average Financing to Deposit Ratio (FDR) is 85.58% and it demonstrates efficient financing distribution. In 2021, the lowest FDR was 38.33% at Bank Muamalat Indonesia and in 2020, the highest was 196.73% at Bank Bukopin Syariah. With a high of 217.40% in 2017 at Bank Panin Dubai Syariah, the average Operating Expenses Operating Income (OEOI) of 92.31% demonstrates that the majority of Islamic banks are still inefficient. Also, ROA is rather low, at 1.47% on average, which means that banks aren't very profitable. In 2017, Bank Panin Dubai Syariah lost as much as -10.77% of its assets, while in 2019, Bank BTPN Syariah had the greatest ROA at 13.58%. With a standard variation of 4.34%, ROA varies significantly throughout banks. Islamic banks in Indonesia are very

similar to one another in terms of total assets, with data distribution approaching normal, as shown by the average bank size (SIZE) of IDR 9.69 trillion.

Model Selection Test

When dealing with panel data regression, using the right model—Common Effect, Fixed Effect, or Random Effect—is crucial. The following are descriptions of the many tests that are part of this process: the Chow test, the Hausman test, and the Lagrange multiplier test.

Table 5
Chow Test Results

Effect Test	Statistics	Prob
Cross-section Chi-square	31.694835	0.0000

Source: data processed by researchers, 2024

The Cross-sectional Probability Chi-square value of 0.000 is less than the generally accepted significance threshold of 0.05, according to the data provided in table 5. The Fixed Effect model seems to be the superior choice over the Common Effect approach. Results from the Hausman test, which was also conducted, are as follows.

Table 6
Hausman Test Results

Effects Test	Statistics	Prob.
Random cross-section	31.870803	0.0000

Source: data processed by researchers, 2024

The results of the random cross-section value being 0.0000 > 0.05, as shown in table 6, indicate that the chosen FEM model accepts H1 and rejects H0.

The Fixed Effect Model (FEM) was chosen because of its performance in the Chow and Hausman tests. In order to determine how CAR, FDR, and OEOI impact ROA, FEM is used. Here are the outcomes of the panel data regression that was conducted using the FEM model:

Table 7
FEM Selected Regression Model

Variables	Coefficient	Std. Error	t-statistic	Prob.
C	5.271272	1.795353	2.936065	0.0054
CAR	1.898042	0.366738	5.175472	0.0000
FDR	0.196441	0.114216	1.719915	0.0928
OEOI	-0.420397	0.172021	-2.443875	0.0188
CAR_SIZE	0.196342	0.037980	5.169654	0.0000
FDR_SIZE	0.025502	0.012880	1.979965	0.0543
OEOI_SIZE	-0.052572	0.018868	-2.786297	0.0080
R-square 0.912845		F-statistic 33.838		
Adjusted R-square 0.885868		Prob. (F-statistic) 0.0000		

Source: data processed by researchers, 2024

Based on Table 7 above, the regression equation used in this study is as follows:

$$ROA = 5.271 + 1.898*CAR + 0.196*FDR - 0.420*OEOI + 0.196(CAR*SIZE) + 0.026(FDR*SIZE) - 0.053(OEOI*SIZE) + e$$

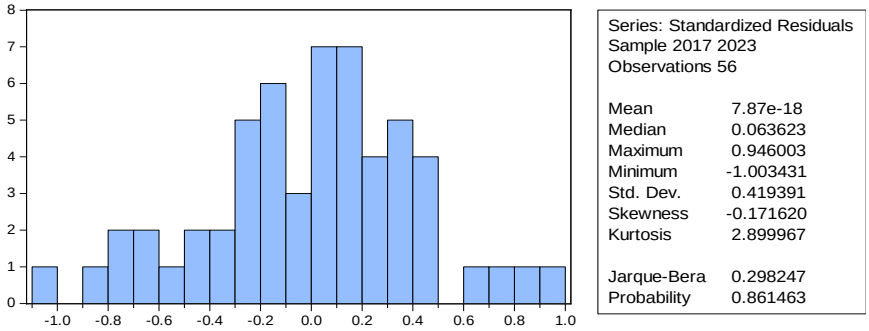
It is important to examine traditional assumptions before doing hypothesis testing. To check whether the regression model satisfies the requirements of residual normality,

heteroscedasticity, autocorrelation, and multicollinearity, the classical assumption test is run. According to Sugiyono (2017), in order for a regression model to be excellent, it must adhere to a number of classical assumptions that seek to provide independent estimates and trustworthy testing. Regression estimates will be the Best Linear Unbiased Estimator (BLUE) if the classical assumptions are satisfied, allowing the investigation to proceed to the next test step.

The following are the results of the normality test:

Figure 1

Normality Test Results



Source: Data processed by researchers, 2024

Visual inspection of Figure 1 reveals a Jarque-Bera probability value of 0.861463 superior than 0.05. Hence, the data follows a normal distribution, satisfying the regression model's normality assumptions.

The multicollinearity test follows in the second round of testing. The findings of the multicollinearity test are as follows:

Table 8

Multicollinearity Test Results

	CAR	FDR	OEOI
CAR	1,000,000	0.097023	-0.295856
FDR	0.097023	1,000,000	0.098404
OEOI	-0.295856	0.098404	1,000,000

Source: data processed by researchers, 2024

The connection between the independent variables, namely CAR, FDR, and OEOI, is less than 1, and it varies from -0.295856 to 0.98404, according to the findings of the multicollinearity test in table 8. So, it can be concluded that multicollinearity is not present in the model used in this research.

The heteroscedasticity test is the third one that is run. Here are the outcomes of the test for heteroscedasticity:

Table 9

Heteroscedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.840142	1.459392	1.946113	0.0584
CAR	-0.456876	0.363299	-1.257576	0.2155
FDR	0.052131	0.089332	0.583566	0.5626
OEOI	0.015134	0.140635	0.107609	0.9148

Source: data processed by researchers, 2024

A significant value of 0.2155 for the CAR variable, an FDR of 0.5626, and an OEOI of 0.9148 were determined via heteroscedasticity testing using the Glejser model. We may

infer that the data does not exhibit heteroscedasticity as all of these values are larger than 0.05. This means that the regression model satisfies the homoscedasticity assumption.

Following the completion of the classical assumption test, the following outcomes should be considered in a hypothesis test.

The effect of CAR on ROA

A t-value of 5.175 and a probability value of 0.000 were determined for CAR according to the data in table 5. It has been shown that CAR significantly affects ROA due to the fact that Prob. 0.000 <0.05 and t count 5.175> t table 2.0076. This leads to the acceptance of H1.

The effect of FDR on ROA

According to the data in table 5, the likelihood of FDR is 0.093, with a t-count of 1.719 and a t-table value of 2.0076. Since 1.719 > 2.0076 and 0.093 > 0.05 in terms of probability. Therefore, H2 is not accepted.

The effect of OEOI on ROA

A probability value of 0.019 for OEOI and a computed t of -2.444 were found in Table 5. The result H3 is approved since the estimated t-value is 2.444 > 2.0076 and the probability value is 0.019 < 0.05.

Coefficient of Determination (R^2)

The R-squared value is 0.912845, or 91.3%, according to the findings of the determination coefficient test, as shown in table 5 above. This means that nine1.3 percent of the variation in ROA can be explained by the set of independent variables that includes CAR, FDR, and OEOI. Other variables, such as dividend policy, green investment, GCG, etc., may account for the remaining 18.7 percent.

Firm Size Moderates the Effect of CAR on ROA

Table 5 displays the results of the calculations. The value of the interaction between CAR and firm size (CAR*SIZE) is 5.1697, which is higher than the t-table value of 2.0076. Plus, it's less than 0.05, with a probability value of 0.000. We may infer that the firm size variable can somewhat attenuate the influence of CAR on ROA, as the hypothesis is accepted.

Firm Size Moderates the Effect of FDR on ROA

The value of the interaction between FDR and firm size (FDR*SIZE) is 1.97996, which is less than the t table value of 2.0076, according to the calculation findings provided in table 5. The probability value is also more than 0.05, coming up at 0.054. It follows that the firm size variable cannot mitigate or diminish the impact of FDR on ROA, since the null hypothesis is rejected.

Firm Size Moderates the Effect of OEOI on ROA

A value of 2.786297, which is higher than the t-table value of 2.0076, is demonstrated by the interaction between BOPO and Firm size (OEOI*SIZE), according to the computation results provided in table 5. Also, the likelihood value is greater than 0.05 at 0.008. This provides support for the null hypothesis and allows us to draw the conclusion that firm size modifies OEOI's influence on ROA to some extent.

DISCUSSION

The effect of CAR on ROA

The research found that CAR had a t-value of 5.175 and a probability value of 0.000. It has been shown that CAR significantly affects ROA due to the fact that Prob. 0.000 <0.05 and t count 5.175> t table 2.0076.

These findings are supported by the financial stability theory proposed by Minsky 1977 (Surya & Iqbal, 2024). According to this theory, an institution's financial stability, including banking, is highly dependent on its capital adequacy. Adequate capital reflects the bank's ability to absorb the risk of loss from its business activities, including credit risk, operational risk, and market risk (Yuliana & Listari, 2021). Thus, banks that have a high *Capital Adequacy Ratio* (CAR) can maintain their operational stability while increasing efficiency in managing productive assets. This stability ultimately contributes to increased profitability, as reflected in Return on Assets (ROA) (Amin and Jaya, 2024; Mawardi and Jaya, 2024).

Based on Bank Indonesia regulations, banks are required to maintain a CAR value of a minimum standard of 8%. This is one of the reasons why CAR can affect profitability. According to research conducted by Ardianti & Zulkifli (2024)It is stated that CAR can influence ROA growth by effectively channeling funds. This means that if the CAR value held by the bank is too high, it may indicate that the bank's capital is excessively large, and therefore, the bank's management must strive to utilize the available funds to increase profitability. Furthermore, banks with sufficient capital are considered more capable of financing risky assets and developing their business. This discrepancy may be caused by the fact that a high CAR can hinder the bank's business expansion, which in turn can negatively affect the bank's financial performance. Additionally, this study aligns with research by Widyastuti & Aini (2021); Yuliana & Listari (2021), which shows that CAR has a positive and significant effect on profitability.

The effect of FDR on ROA

The research found that t count is 1.719 and t table is 2.0076, with a probability value of 0.093 for FDR. Since 1.719 > 2.0076 and 0.093 > 0.05 in terms of probability. This disproves the null hypothesis that FDR has no appreciable influence on ROA.

This means that the ratio of financing to third-party funds does not necessarily have a direct impact on a bank's profitability, and that the Financing to Deposit Ratio (FDR) does not play a substantial role in affecting Return on Assets (ROA). Several variables might be at play here, including the effectiveness of finance management, the amount of non-performing financing (NPF), or the quality of the financing itself. Several Islamic banks with FDR levels exceeding 90% had a decrease in ROA owing to high NPF levels, according to the Financial Services Authority (OJK) study from 2023. Even while some Islamic banks have high FDRs, the Islamic Banking Statistics (SPS) demonstrate that their persistently poor ROA is due to their inadequate operational efficiency. Therefore, if strong finance quality and operational efficiency are not there, FDR alone will not be enough to reflect profitability performance.

This finding is consistent with the study by Agustin Tri Lestari (2021); Jazila et al. (2021); Kamelia et al. (2019) On the impact of FDR on ROA, findings indicate that FDR does not significantly affect ROA. This indicates that changes in FDR may not have a direct bearing on banks' profitability, as assessed by ROA. Bank profitability may be more heavily influenced by other criteria including operational efficiency, asset quality, and external economic circumstances.

The effect of OEOI on ROA

According to the study's findings, the t-count is -2.444, and the probability value of OEOI is 0.019. The null hypothesis, which states that OEOI has a substantial negative influence on ROA, is accepted since the t-value is 2.444 > 2.0076 and the likelihood value is 0.019 < 0.05.

Drorthy and Claude's (2024) hypothesis, which posits that efficient cost management is a component in enhancing a company's financial success, lends credence to this finding. The operational efficiency of a bank is shown by OEOI, which stands for Operating Expenses Operating revenue, in relation to the revenue it generates. Return on Assets (ROA) is a measure of a bank's profitability, and a high OEOI ratio suggests operational inefficiencies (Kurnia & Wahyudi, 2022).

The results of this study are in line with the research of Yuliana & Listari, (2021) and Kurnia & Wahyudi, (2022), This shown that OEOI significantly reduces ROA. Highlighted the importance of operational efficiency as the primary determinant of bank profitability. Reduced profit margins and ROA might be the result of a high OEOI, which indicates high operating expenses relative to operating income. Banks that are successful in keeping OEOI low are more likely to have efficient management of operational expenses, which leads to greater financial performance. The significance of efficient cost management in preserving the profitability and competitiveness of banks is highlighted by this discovery.

The Influence of *Firm Size* in Moderating the Influence of CAR on ROA

Evidence like this shows that OEOI drastically decreases ROA. Stressed that operational efficiency is the key to a bank's bottom line. When operating expenditures are high in relation to operational income, it suggests that profit margins and return on assets (ROA) are reduced. A lower OEOI is an indicator of well-managed operational expenditures, which in turn indicates better financial performance for the bank. Findings like this demonstrate how crucial effective cost management is for banks to maintain their profitability and competitiveness. Mohammad & Bujang (2019) This kind of evidence proves that OEOI significantly lowers ROA. A bank's bottom line is directly proportional to how efficiently its operations run. It is indicative of lower profit margins and return on assets (ROA) when operational costs are high in comparison to operational revenue. Better financial success for the bank is indicated by a reduced OEOI, which is an indicative of well-managed operational expenses. Such results highlight the critical nature of efficient cost management in ensuring the continued profitability and competitiveness of financial institutions.

Therefore, the MRA test shows that the influence of CAR on ROA is moderated by firm size, suggesting that larger organizations are better able to manage their capital adequacy in a way that maximizes profitability. This may be due to larger enterprises' superior resource allocation and resilience in the face of market challenges. So, to make the correlation between CAR and financial success even stronger, firm size matters. According to the findings of this investigation, Indradi & Taswan, (2022), Who stated that company size can moderate the effect of CAR on ROA?

The Influence of *Firm Size* in Moderating the Influence of FDR on ROA

The t-statistic result is 1.979965 with a probability of 0.0543, which is larger than 0.05, according to the MRA test conducted on the FDR variable versus ROA moderated by

firm size. If the null hypothesis states that the impact of FDR on ROA is unaffected by firm size, then the following must be true.

With a probability of 0.0543, the t-statistic result is 1.979965, which is more than 0.05, as per the MRA test done on the FDR variable vs ROA moderated by company size. The following must be correct if the null hypothesis is correct and firm size has no effect on the effect of FDR on ROA.(Harsono, 2024), which asserts that variables like as business size, liquidity, risk, and management quality are not the most important in deciding profitability. The impact of FDR on ROA is complicated and indirect since big organizations may have funding dispersed across many divisions. It is possible for the beneficial effect of FDR on ROA to be mitigated when a firm grows in size due to the multiplicative effect of finance management complexity.

This study is in line with the findings presented by Muarief et al. (2024), demonstrating that the impact of the Financing to Deposit Ratio (FDR) on Return on Assets (ROA) cannot be mitigated by regard to business size. This implies that a larger company's access to markets and finance sources does not always translate to better financing management or more profits for the bank.

The Influence of *Firm Size* in Moderating the Influence of OEOI on ROA

The t-statistic value of -2.786297 was obtained with a probability of 0.0080, which is lower than 0.05, from the MRA test that was performed on the OEOI variable versus ROA moderated by firm size. In cases when the impact of OEOI on ROA can be mitigated by firm size, the hypothesis may be accepted.

These results indicate that company size plays a significant role in strengthening the relationship between OEOI and ROA, which is supported by the Theory of Economies of Scale proposed by Williamson, (1975). This theory explains that larger companies have advantages in terms of operational efficiency because they can take advantage of larger economies of scale. With a larger size, banks can reduce costs per unit of operation and increase productivity, which ultimately supports higher profitability, reflected in ROA.

Previous studies also support this finding, such as that conducted by Kurnia & Wahyudi, (2022) , who found that company size strengthens the impact of operational cost efficiency on profitability. Their research shows that large banks tend to have more resources to manage operational costs more efficiently, which contributes to increased ROA. Likewise, Zamzam & Suryaningprang (2024) suggest that large companies have the capacity to optimize cost management, which reduces OEOI and improves financial performance, as reflected in ROA.

CONCLUSION

The research found that ROA is considerably affected by CAR in a favorable way, negatively by OEOI, and unaffected by FDR. On top of that, firm size does not mitigate the impact of FDR on ROA, but it does attenuate the relationships between CAR and ROA and OEOI and ROA. These results indicate that operational efficiency and capital sufficiency are the most important factors in deciding profitability, whereas finance distribution does not directly affect it. Furthermore, the impact of Firm Size as a moderating variable is shown by its ability to either amplify or diminish these correlations, especially for CAR and OEOI. The data coverage of this research could not be representative of other business sectors, and other factors were not taken into consideration, which might have an impact. For future studies, it would be wise to broaden the scope of the study to include other industries,

increase the size of the sample, and include other factors like operational efficiency and risk management.

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