



Panel Modelling to Analyze Financial Performance : Evidence on Islamic Commercial Bank in Indonesia

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ABSTRACT

Financial performance is a vital instrument in profit-making in the banking sector, therefore maintaining optimal is a must for banks to get maximum profit. This study aims to analyze the influence of financial performance instruments with CAR, NPF, OCR, and DER proxies on return on assets (ROA) in Islamic Commercial Banks (BUS). This research was conducted on Islamic Commercial Banks for 2016-2020. The sampling method used was purposive sampling method with a total samples 12 of Islamic Commercial Banks. The data used secondary data in the form of financial reports that published by Otoritas Jasa Keuangan (OJK) through the website www.ojk.go.id. The analytical method used multiple linear regressions of panel data with a Fixed Effect Model (FEM) selection using EVIEWS 10 statistic tool. The results show that the CAR, NPF, OCR, and DER variables have an effect on ROA.

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Introduction

Bank is an Islamic Islamic-based financial institution whose main function is to collect funds from the public and channeling them back to the public. The funds raised are in the form of deposits, whereas the funds distributed are in the form of credit or loans. Banks are one of the factors supporting the community's economy because they can improve the standard of living and welfare that can cover all circles. Banking can be said to be an economic milestone in Indonesia (Ningsih, 2020).

Indonesia is a country that adheres to a dual banking system that implements a conventional banking system and Islamic banking (Raharjo et al., 2020). Conventional banks in their operations apply an interest system, in contrast to Islamic banks based on Islamic Islamic principles which do not apply interest but use a profit-sharing system.

Islamic banks show their existence in the Indonesian banking industry. This can be seen in the Expansion of the number of Islamic Commercial Banks from the beginning of their emergence until the end of 2020, based on Islamic Banking Statistics data published on the official website of the Otoritas Jasa Keuangan (OJK) there are 14 Islamic Commercial Banks and 20 Islamic Business Units. Moreover, based on data, the profits obtained by Islamic Commercial Banks have increased every year, especially since the inauguration of Bank Syariah Indonesia (BSI) which is the result of the merger of three state-owned Islamic Commercial Banks (PT. Bank BRI Syariah, PT. Bank BNI Syariah, PT. Bank Syariah Mandiri) in early 2020.

Tabel 1. Expansion of Islamic Banking in 2016-2021

Year	Total Asset	Total Office	ROA (%)
2016	254.184	1.869	0.63
2017	288.027	1.825	0.63
2018	316.691	1.875	1.28
2019	350.073	1.919	1.73
2020	397.073	2.034	1.40
2021	441.769	2.035	1.55

Source: Islamic Banking Statistics (SPS) in 2018, 2021

The above data show the Expansion of Islamic banking from to 2016-2021. The Expansion can be proven by the total assets owned by Islamic banking continue to grow in every year for the 2016-2021 period with total assets recorded at 441,769 trillion rupiah. Likewise, ROA and the number of Islamic Commercial Banks offices continue to increase. Especially when there was a Covid-19 pandemic that hit the universe at the end of 2019 and impact on various sectors, including the banking sector. However, in this case, Islamic banking is able to maintain its existence in the midst of a pandemic due to various existing factors. One of them is due to the merger of three state-owned Islamic banks. This has resulted in a significant growth in profits of Islamic commercial banks, the increase in profits provides opportunities for Islamic banks to expand their business by building offices in each region. Besides that, the use of access to digital services such as mobile banking which is growing rapidly has resulted in Islamic banks getting rapid profits because mobile banking makes it easier for users to trade without having to transact directly.

The increase that occurs is inseparable from the hard work of Islamic banks that continue to strive to innovate and create a variety of products that vary in accordings to

the needs of society. Various products offered by Islamic banks include buying and selling (*murabahah, salam, isthisna'*), financing and investment (*mudharabah, musyarakah*), financing with a rental system (*ijarah*), guarantees (*kafalah*), and pawn products (*rahn*). The public's encouragement and desire for changes in banking is one of the reasons Islamic banks were established, especially the majority of Indonesians are Muslims who want banking services accordant to the Islamic Islamic principles.

This fairly rapid Expansion certainly has a positive impact on stakeholders, be it for the government, investors, the community and for the bank itself. For the government, the existence of a Islamic bank is able to improve the country's economy. For investors, if the Expansion of Islamic banks shows a positive and significant direction, investors and potential investors will be more interested in issuing their funds to Islamic banks when viewed from the distribution of dividends and have promising business prospects. In addition, for the public, the existence of this Islamic bank can improve their welfare because Islamic banks offer a variety of financing without any burdensome interest. As for the bank itself, the more developed the company, the greater the profit obtained and shows that the bank has good financial performance.

Financial performance is one of the references in measuring how optimal a company or agency is in regulating the management of its company. The better the financial performance is given that the company is in a healthy state. The company's financial performance can be seen in its financial statements using measurement indicators, one of which is financial ratios. Financial ratios that are often used in measuring the level of financial performance are profitability ratios that include ROA (Return on Asset) and ROE (Return on Equity). ROA is a ratio that measures how much profit a company earns by utilizing its assets. Meanwhile, ROE measures how much profit a company gets by utilizing its capital. Bank Indonesia (BI) measures its profitability ratio by using ROA. Because the value of bank's profitability can be measured using assets sourced from public deposits (Raharjo et al., 2020).

According to research by Yuliana & Listari (2021) found that CAR, FDR, OCR affect on ROA. Meanwhile to the research of Hendrawan Raharjo et al., (2020) found that CAR, NPF, OCR and Inflation affect on ROA. In addition, the research of Ardhefani et al., (2021) found that CR and DER have an affect on ROA. Based on some of the research above, shows that CAR, NPF, FDR, OCR, Inflation, CR and DER are some of the factors that affect ROA.

CAR (*Capital Adequacy Ratio*) is one of the solvency ratios, where this ratio is used to calculate and see whether the existing capital of a bank or company can produce a risk such as disbursed credit. CAR can also be an indicator of how an asset owned by a Islamic

Commercial Bank is declining. Research conducted by Abdul (2017); Nyanyuki et al., (2022); Odekina et al., (2019); Pradhan & Shrestha (2017) pointed out that ROA is influenced by CAR because banks can optimize capital channeled through credit. Meanwhile, Indiarti & Utomo (2023); Sitompul & Nasution (2019); Sutrisno (2023) stated that ROA is not influenced by CAR because the bank has not maximized the existing capital to be channeled through credit, so the profit obtained has not been maximized.

NPF (*Non Performing Finance*) is a ratio that measures the risk of banks disbursing problematic financing. The lower the NPF value, the ROA will increase. According to research by Abimbola (2020); Anayochukwu & Ph (2016); Çollaku & Aliu (2021); Gabriel et al., (2019) pointed out that NPF affects ROA, this is due to the problematic distribution to Islamic Commercial Banks. Meanwhile to the research Indiarti & Utomo (2023); Sitompul & Nasution (2019) pointed out that NPF does not affect ROA because there is a problem with financing distribution to Islamic commercial banks.

OCR (Operating Costs and Revenue) is a ratio used to compare operating costs with operating revenue. The lower the OCR value, it indicates that the bank is able to manage its operations efficiently because the operational costs incurred are few. According to the reserach by BAL & SÖNMEZER (2022); Kariuki (2021); Lee (2023); Muriithi (2017) pointed out that ROA is influenced by OCR because banks can balance operating expenses with operating income. Meanwhile, the research of Sabir et al., (2012) pointed out that ROA is not influenced by OCR because Islamic commercial banks have not been efficient in regulating their operational costs, which results in the income obtained not being able to cover the costs incurred by a Islamic Commercial Bank.

Debt to Equity Ratio (DER) is the ratio used to estimate debt with capital. The lower the DER value has a positive impact on ROA. Research of Alzubi & Bani-hani (2021); Nasution et al., (2019); Nwude et al., (2016); Odhiambo et al., (2022) pointed out that ROA is influenced by DER this is because the available capital can be maximized to both pay off debts and expand its business such as through investment. Meanwhile, the research of Hafsoh Laela & Hendratno (2019); Herliana (2021) pointed out that ROA is not affected by DER because the amount of capital used to cover debts is still insufficient to pay off existing debts, so banks still need additional capital to cover existing debts.

Based on the background and inconsistencies of the results of previous studies, this study examines empirically the factors that influence the performance of profitabilitas as proxied by the return on assets in Islamic commercial banks for the 2016-2020 period. This study uses panel data analysis techniques because in the panel data approach

accurate images are related to model estimates in the presence of common, fixed, and random modeling.

Literatures Review

Islamic Bank

A Islamic bank is an institution engaged in Islamic-based finance whose activities are carried out by collecting and distributing funds to the public in accordance with principles in accordance with Islamic law, where business activities and financial products are carried out in accordance with the Qur'an and Hadith (Ledhem, 2022).

The first Islamic bank that appeared in Indonesia was Bank Muamalat which was established on November 1, 1991. The Indonesian Ulema Council (MUI) made the idea to create a bank where its business runs in accordance with Islamic principles. The Expansion of Islamic banks in Indonesia then conventional banks that create Islamic units to meet the wishes of people who want to trade Islamic.

Financial performance

Financial performance is an indicator that can show effectiveness and efficiency in an organization or company to achieve a goal. Financial performance can also be said to be a formal effort made to consider whether the activities carried out at a certain time are efficient and effective (Yusuf & Surjaatmadja, 2018).

Financial performance can be used as a sign of how the company's financial condition at a certain time so that internal and external parties of the company can see how the company's financial condition is (Tudose et al., 2022). Financial performance also describes how a strength of financial management in the company and looks at the available assets where the company can benefit. Financial performance measurements aims to ascertain whether decision-making during activities is on target, measuring financial performance can also be an evaluation material for banks to determine future steps to improve performance that has been carried out previously (Bayaraa, 2017).

Return On Assets (ROA)

Return on Asset (ROA) is a ratio used to calculate the ratio of net income to assets in a company. ROA is often used to see if a company or bank can profit from some of the policies implemented. ROA also has the goal of how existing investments in a company can provide the profit estimated by a company. As for the formula of Return on Asset (ROA) (Rostami et al., 2016).

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}} \times 100\%$$

Capital Adequacy Ratio (CAR)

Capital Adequacy Ratio (CAR) is an indicator used to compare capital with risk weighted assets (Hassan et al., 2016). As for the formula of CAR, it is:

$$CAR = \frac{(\text{Tier 1 Capital} + \text{Tier 2 Capital})}{\text{Risk Weighted Asset}} \times 100\%$$

Non Performing Finance (NPF)

Non Performing Finance (NPF) is a ratio that is a benchmark for bad or problematic financing at a bank. Return On Asset (ROA) can increase if non-performing financing at a bank is low, while Return On Asset (ROA) can decrease if there is non-performing financing that occurs at a high bank because the non-performing financing can hinder the performance of a bank so that it has an impact on financing that indirectly decreases (Fianto et al., 2019).

The formula of NPF is as follows:

$$NPF = \frac{\text{Total of Bad Financing}}{\text{Total of Financing}} \times 100\%$$

Operating Cost and Revenue (OCR)

Operating Costs and Revenue (OCR) is a ratio that compares operating costs and operating revenue obtained by banks, as well as indicators such as the efficiency of an activity carried out to run its business in terms of credit loans or financing in Islamic banks, where Islamic banks make a ratio as its main margin or profit (Raharjo et al., 2020).

As a financial institution that cares for the community, the principles that exist in a bank greatly affect the health of the bank itself, if this OCR ratio is small, the bank will indirectly incur costs more efficiently and if operating revenue increases it can result in the profit generated before tax can be reduced. Bank Indonesia also sets the OCR value between 94% and 96% to still fall into the normal category and has a positive impact banks (Azizah & Manda, 2021). There are some formulas from OCR:

$$OCR = \frac{\text{Operating Cost}}{\text{Operating Revenue}} \times 100\%$$

Debt Equity Ratio (DER)

Debt to Equity Ratio (DER) is a ratio to compare total liabilities or debt with equity, where the smaller the value of DER, the positive influence on the Return on Asset (ROA) or profit of a bank. If the debt to a bank exceeds the assets owned, then the bank must find another source of funds to pay off the debt, because a healthy company can be seen in the small value of the debt. The formula of DER is as follows:

$$DER = \frac{\text{Liabilities}}{\text{Equity}} \times 100\%$$

Hypotheses Development

CAR is a ratio to see and measure a bank's capital whether it can support assets that contain and can generate a risk, such as loans in the form of loans that are channeled. This ratio can also be a benchmark for how far the assets in the bank decrease and are closed by the equity of the existing bank. In other words, the higher the CAR ratio, the better the condition of the bank. Therefore, the smaller the risk in the bank, the greater the profits for the bank (Sudarmawanti & Pramono, 2017).

The relationship between CAR is directly proportional to ROA because CAR is a comparison between capital and risk related to capital that contains activities that produce a risk. If the value of CAR increases, it will have an impact on the bank, thereby increasing the bank's profits. This is supported by the research of Odekina et al., (2019) who state that CAR affects ROA. Therefore, the hypotheses of this study are as follows:

H₁: CAR affects positive significant ROA

The relationship between NPF is inversely proportional to ROA because NPF is bad financing in Islamic commercial banks. If the value of bad financing in the bank increases, of course, the profit obtained by the bank will decrease drastically because financing is one of the bank's sources of income. This is supported by Çollaku & Aliu (2021) which states that NPF affects on ROA. Therefore, the hypothesis of this study is as follows:

H₂: NPF affects positive significant ROA

The relationship between OCR is inversely proportional to ROA because OCR compares operating costs with operating income received by banks. If the value of OCR increases, it indicates that the bank has expenses that are greater than the income received, resulting in the profit obtained by the bank decreasing and having a bad impact on the bank because it indicates that there is poor management. This is supported by the research of Odhiambo et al., (2022) who stated that OCR affects on ROA. Therefore, the hypotheses of this study are:

H₃: OCR affects negative significant ROA

The relationship between DER is inversely proportional to ROA because DER compares total debt to equity, If the value of DER rises it indicates that the bank cannot cover its debt using capital, or the bank's debt is greater than capital. Debt that is larger than capital results in a decrease in profits because banks cannot get more income, instead adding outside sources of funding to cover soaring debt. This indicates that there is poor

management of the bank itself. This is supported by research by Alzubi & Bani-hani, (2021) who stated that DER affects on ROA. Therefore, the hypothesis of the study is as follows:

H₄: DER affects positive significant ROA

Methods

This research is a secondary data quantitative research. The data is taken from the official website of the Otoritas Jasa Keuangan (OJK) www.ojk.go.id in the form of financial reports. The research population is all Islamic commercial banks registered with the OJK from 2016-2020 and the sample selection used a purposive sampling technique and 12 samples were obtained that met the criteria. The data analysis used is multiple linear regression with panel data (a combination of time series and cross section) utilizing the Eviews 10 statistic tool.

Results

Statistic Descriptive

Tests conducted on 12 Islamic commercial banks registered with the OJK with the aim of showing the amount of minimum, maximum, average, and standard deviation of each variable.

Tabel 2. Statistic Descriptive

	CAR	NPF	OCR	DER	ROA
Mean	27.27070	2.427437	92.97106	721.1809	1.373367
Median	19.29000	2.490000	93.93000	655.0000	0.620000
Maximum	330.8400	4.980000	217.4000	3047.000	13.90000
Minimum	10.16000	0.000000	40.36000	11.00000	-11.02000
Std. Dev.	36.96197	1.487243	18.39133	379.2634	3.560711

Source : data processed by researcher

Panel Data Regression

The first stage of testing begins with testing the selection of models. In this test, there is a chow test and a hausman test. The chow test is carried out to select the common (CEM) or fixed (FEM) model. If the significance value < 0.05 then the selected model is FEM, while if the significance value > 0.05 then the selected model is CEM. After it is known which model was selected as a result of the chow test, the next step is to conduct a hausman test to select the fixed (FEM) or random (REM) model. If the significance value <

than 0.05 then the selected model is FEM, while if the significance value > 0.05 then REM model is chosen. There are several test results as follows:

Tabel 3. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1330.129691	(11,183)	0.0000
Cross-section Chi-square	874.380250	11	0.0000

Source : data processed by researcher

Tabel 4. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	34.262556	4	0.0000

Source : data processed by researcher

The test results of the Chow and Hausman tests state that the selected model is the FEM because, based on the above tests, a significance value < 0.05 is obtained. The results of testing FEM:

Table 5. Fixed Effect Model Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.523916	0.090387	105.3680	0.0000
CAR	0.058032	0.000658	88.15513	0.0000
NPF	0.083672	0.015102	5.540324	0.0000
BOPO	-0.116125	0.000973	-119.2858	0.0000
DER	0.001192	7.47E-05	15.97068	0.0000
Cross-section fixed (dummy variables)				
R-squared	0.997572			
Adjusted R-squared	0.997373			
F-statistic	5011.612			
Prob(F-statistic)	0.000000			

Source: data processed by researcher

Based on the tabel 5 above as for regression equation is presented as follows :

$$Y = 9.523916 + 0.058032X_1 + 0.083672X_2 - 0.116125X_3 + 0.001192X_4 + e$$

$$ROA = 9.523916 + 0.058032_{CAR} + 0.083672_{NPF} - 0.116125_{OCR} + 0.001192_{DER} + e$$

Coefficient of Determination (R²) Square dan F Test

Based on the table 5, the coefficient of determination or the value of the adjusted R Squared (R²) shows a value of 0.997373. it can be interpreted that the variables CAR, NPF, OCR, and DER affect ROA by 99.73%. Meanwhile, 0.27% were influenced by other variables outside the study. F test based on the table 5 above obtained prob(F-statistic) value 0.0000. It can be interpreted that the benchmark value of prob (F-Statistic), if the value of prob (F-statistic) is < 0.05 then it means that it affects Y. The results of the data processing above indicate that CAR, NPF, OCR, and DER have a stimulatory affects on ROA.

Discussion

Effect of CAR on ROA

Based on the table 5, it shows that the first hypothesis is accepted where CAR affects on ROA. This research supports the findings of previous research from Abdul (2017); Pradhan & Shrestha (2017); Susila et al., (2021) pointed out that CAR affects on ROA. This proves that Islamic Commercial Banks can maximize existing capital so that they are able to influence Return On Asset (ROA) by utilizing the excess existing capital to supplement their profits through investment, cooperation and income from the sale of Islamic Commercial Bank products.

This statement is evidenced by comparing t_{count} greater t_{table} ($88.15513_{t_{count}} > 1.97420_{t_{table}}$) and significance $\alpha = 5\%$ ($0.0000 < 0.05$) which means that in this study the CAR ratio has an effect on ROA in Islamic Commercial Banks for the 2016-2020 period.

Effect of NPF on ROA

Based on the table 5, it shows that the second hypothesis is accepted where NPF affects on ROA. This research supports the findings of previous research from Dichevska et al., (2017); John (2018); Ljube Jolevski (2017) pointed out that NPF affects on ROA. The results of the study show that NPF affects on ROA, which means that the NPF value in the research period is low, or it can be said that there are only a few problematic financing or bad financing found in Islamic Commercial Banks in the research period because it is dominated by customers who pay financing on time so it does not have a negative impact on the income or profits obtained.

This statement is evidenced by comparing t_{count} greater t_{table} ($5.540324_{t_{count}} > 1.97420_{t_{table}}$) and significance $\alpha = 5\%$ ($0.0000 < 0.05$) which means that in this study the NPF ratio has an effect on ROA in Islamic Commercial Banks for the 2016-2020 period.

Effect of OCR on ROA

Based on the table 5, it shows that the third hypothesis is accepted where OCR has a negative effect on ROA. This research supports the findings of previous research from Kariuki (2021); Lee (2023); Muriithi (2017) pointed out that OCR affects on ROA. The results of the study show that OCR has a negative influence on ROA, which means that a higher OCR value will impact in a decrease in income or profits in Islamic Commercial Banks. This is because Islamic commercial banks spend more of their operational costs than the operating income receives, resulting in an increase in the value of OCR, the greater the operational costs incurred shows that banks cannot be efficient in managing

operational costs which are not proportional to the profits obtained at Islamic Commercial Banks.

This statement is proved by comparing t count greater t table ($-119.2858_{t \text{ count}} > 1.97420_{t \text{ table}}$) and significance $\alpha = 5\%$ ($0.0000 < 0.05$) which means that in this study the OCR ratio has an effect on ROA in Islamic Commercial Banks for the 2016-2020 period.

Effect of DER on ROA

Based on the table 5, it shows that the fourth hypothesis is accepted where DER affects on ROA. This research supports the findings of previous research from Alzubi & Bani-hani (2021); BAL & SÖNMEZER (2022); Odhiambo et al., (2022) pointed out that DER affects on ROA. The results of the study show that DER affects ROA because Islamic Commercial Banks can balance debt with their capital. The Bank is also considered capable of paying off short-term debts which means that the Bank has the ability to manage its capital so that the existing capital is greater than its debt. This can attract investors to inject their funds into Islamic Commercial Banks seeing their very optimal financial condition.

The statement is proved by comparing t count greater t table ($15.97068_{t \text{ count}} > 1.97420_{t \text{ table}}$) and significance $\alpha = 5\%$ ($0.0000 < 0.05$) which means that in this study the DER ratio has an effect on ROA in Islamic Commercial Banks for the 2016-2020 period.

Conclusion

Based on the analysis of 12 Islamic Commercial Banks (BUS) taken from 2016-2020, the first hypothesis was supported. The CAR ratio has an effects on ROA of Islamic commercial banks because banks are able to optimize existing capital by utilizing the excess available capital to increase profits through investment, cooperation, and income from the sale of Islamic Commercial Bank products.

Hypothesis 2 in this research was supported. The NPF ratio has an effects on ROA because the NPF value in the research period was low, or it can be said that there were only a few problematic financing or bad financing that existed in Islamic Commercial Banks during the research period because it was dominated by customers who paid financing on time so that it did not adversely affect the income or profits obtained.

Furthermore hypothesis 3 in this research was supported. The OCR ratio has a negative influence on ROA, it means that the higher the OCR value will have an impact on decreasing in income or profits in Islamic Commercial Banks. This is because Islamic commercial banks spend more on the operational costs than the revenue receives, resulting in a high OCR value, the greater the operational costs incurred shows that the

bank is not efficient in managing its operational costs so that it is not comparable to the income earned at Islamic Commercial Banks.

Meanwhile hypothesis 4 was supported. The DER ratio has an affects on ROA, because it is able to balance debt with owned capital. Banks are also considered capable of paying off short-term debts which means that banks have a good ability to manage their capital so that the existing capital is greater than their debts. This can attract investors to inject their funds into Islamic Commercial Banks seeing their very optimal financial condition.

The recommendation that emerges is that Islamic Commercial Banks need to continue to optimize capital, keep NPF's low, manage operational costs efficiently, and maintain a balance between debt and capital to increase ROA and attract investment.

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