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The Impact of Internal and External Variables on Non-performing Financing (NPF) of Islamic Banks in Indonesia

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A B S T R A C T
Islamic banking financing continues to experience better growth and provides great contributions in Indonesia. This industry must innovate products and improve its performance. This research paper aims to improve the Non-Performing Financing (NPF) and efficiency model of Islamic commercial banks in Indonesia while enhancing the quality of governance in the banking industry. In this study, researchers used Data Envelopment Analysis (DEA) to process overall technical efficiency (OTE) and panel regression to establish the causal relationship between independent and dependent variables, both partially and simultaneously. Researchers also analyzed the correlational association between NPF and the efficiency of Islamic banks in Indonesia. The data used in the study were obtained from Islamic commercial banks that were consistently published by Bank Indonesia and the Bank's database. Various micro or internal banking variables were used, and external variables, such as macro variables, were found to influence NPF. The study identified internal variables like CAR and FDR and external variables like GDP and inflation of Islamic banking in Indonesia that significantly impact NPF. Furthermore, the study results suggest that the FDR variable is among the significant variables with the highest significance value. It was also found that the "bad management" and "bad luck" hypotheses were not proven in Islamic banking in Indonesia.

Keywords: Back Luck; Bad Management; Efficiency; Financial Ratios Non-Performing Financing (NPF)

INTRODUCTION

The Indonesian government has been developing Islamic finance since the 1980s. Bank Muamalat was Indonesia's first Islamic financing institution, established in 1991 (Financial Services Authority/OJK, 2024). Regarding regulations, the government issued Law No. 21 of 2008 concerning Islamic banking. Islamic banking are banking that comply toward Islamic law and principles. Islamic banking aims to aid in accomplishing national development plans to achieve justice, unity, and equal distribution of wealth.

Based on Law No. 21 of 2008, the spin-off of Islamic business units must be carried out for a maximum of 15 years or, at the latest, in 2023 since the issuance of the law. With time, Islamic banking experienced a decrease. OJK has offered an option to postpone the spin-off of Islamic banking. Several parties, such as the legislature, banking practitioners, and the OJK, have proposed that Islamic banking spin-offs may be postponed.

Islamic financing is the distribution of financing based on Islamic principles. Islamic principles are based on fatwas and statements of the National Islamic Council (DSN) of the Indonesian Ulema Council (MUI). Islamic financing activities include buying and selling, investment, and service financing. Sales and purchase financing are carried out using

murabahah, salam, and *istishna* contracts. Investment financing is carried out using *mudharabah, musyarakah, mudharabahmusytarakah,* and/or *musyarakahmutanaqishah* contracts. Service financing includes *ijarah; ijarah muntahiyahbittamlik, hawalah* or *hawalahbilujrah, hawalahbilujrah, kafalahbilujrah, ju'alah* and/or *qardh*. Currently, Islamic financing uses a *murabahah* contract and an *ijarah muntahiyahbittamlik* contract.

The number of Islamic banks, both purely Islamic banks and those with Islamic business units, has not grown in the last five years. The total number of banks with activities in the Islamic sector was 44. In 2018, the number of Islamic business units decreased by one bank. This bank moved the Islamic business unit to become an Islamic commercial bank. The number of banks that remain in Islamic banking shows that banks' interest in Islamic businesses is still low. As of March 2020, the total number of banks in Indonesia was 109, according to the Financial Services or OJK report.

Regarding asset growth, Islamic banking grew from IDR356 trillion in 2016 to IDR555 trillion in 2020. However, the value of Islamic banking assets is still too small compared to the total assets of conventional banking. In 2016, the total assets of conventional banking reached IDR6.750 trillion, which means that the proportion of Islamic banking was only 5.27%. Until 2018, the comparison between Islamic and conventional banking was still around 5%.

Regarding profitability, Islamic business units and Islamic commercial banks performed at lower levels than conventional banks from 2016 to 2019. A comparison of banking profitability in Indonesia based on the OJK report shows that when the COVID-19 pandemic occurred in 2020, overall, Islamic and conventional banking experienced a decline. However, the percentage of decline varies; the largest is conventional banking, with a 55.34% decline in 2020 compared to 2019. Meanwhile, for Islamic banks, the decline in performance was 12.70%, while the decline in the performance of Islamic business units reached 28.15 %. On average, the performance of Islamic banks was slightly better than that of conventional banking in 2020.

In line with the FSA Regulation Number 15/POJK.03/2017 article 4, the maximum allowed NPF ratio was 5%. If non-performing financing surpasses the threshold, the bank's profitability will be interrupted, which will influence its strength and effect on the country's economy. The continued growth in assets, third-party funds, and financing tracked by an upsurge in NPF, indicates the poor performance of Islamic banks in Indonesia. The leading cause is the bank's internal factors, which involve policies and strategies, and external factors related to the economy and competition. The internal banking factors include the capital adequacy ratio, financing to deposit ratio, operational efficiency ratio, and return on assets ratio. External factors influencing NPF are gross domestic product, exchange rate, and inflation. In addition to the above factors, the continuation of Sharia banking operations depends on its ability to uphold several factors such as competitiveness, that is reflected in operating efficiency. Good bank performance is critical. Measuring the efficiency level of Islamic banks can be viewed from how good the capability of Islamic banks is because efficiency will decrease expenses and hence increase profitability (Shawtari et al., 2019). Another opinion states that two types of methods are used to measure bank functioning: the size of financial ratios and measures of efficiency (Suzuki & Sastrosuwito, 2011).

Various empirical findings also show that Islamic banks in Indonesia are not yet entirely efficient, especially in managing treasuries and maintaining them continuously. There are still differences in the results for both internal and external factors. This study focuses on calculating efficiency, including inside and outside determinant factors (partially or simultaneously) on NPF and the correlational association between NPF and the efficiency of Islamic banks.

LITERATURE REVIEW

Every company needs to report its performance, especially financial performance, to its investors. This information is presented in the financial statements, which consist of a statement of financial position, a statement of income, owner's equity, and a cash flow statement. According to Bachtiar et al. (2014), financial statements present most of the data regarding the economic activities of public companies that investors and other parties need.

In the 19th century, the patterns of islamic financing were no longer used due to the deterioration of the political system and Muslim society itself, in addition to Western colonialism. In the current context, referring to the fatwa of the National Islamic Council (DSN) of MUI, several forms of payment can be developed according to the characteristics and production of agriculture. For example, *mudharabah, ijara*h, and diminishing musharakah (DM) contracts can be used to overcome the need for agricultural mechanization. Likewise, *murabaha* and *istisna* financing can be a suitable alternative for procuring cows and milk storage tanks. Thus, many choices can be made to develop financing methods. According to Said (2015), the NPF ratio is the ratio of Islamic banking used to describe the financing rate of return customers pay to the bank. In other words, NPF shows the level of financing risk. Based on the NPF criteria set by Bank Indonesia, NPF is divided into current, doubtful, and non-performing financing. Islamic banking (Arabic: *al-Mashrafiyah al-Islamiyah*) is based on Islamic philosophy. In Islam, a law prohibits the use of interest, which is also called usury. In addition to the prohibition on giving interest, there is also a prohibition on investing in businesses that do not comply toward Sharia principles or (*haram*). The conventional banking system cannot guarantee the absence of these things in their investments, for example, in businesses related to producing haram food or beverages, non-Islamic media, and entertainment businesses.

Islamic banking has the same goal as conventional banking; it raises capital from saving and uses the capital to fund business. The application of Sharia Law is the prohibit the following elements in these banking transactions: trading of illicit goods, interest (*riba*), gambling, intentional speculation (*maisir*), as well as ambiguity and manipulation (gharar). Yusuf and Ichsan (2021) examined the performance of Islamic companies from 2011 to 2021 using financial ratios consisting of non-performing financing (NPF), fund deposit ratios, operating costs, operating income, and capital adequacy ratios. The findings show that these variables have a positive influence. Kuswahariani et al. (2020) state that it is not enough to look at the level of NPF. In theory, the higher the NPF, the higher the NPLs faced by the bank. Ideally, the bank divides borrowers into segments: corporate borrowers, medium-sized borrowers, and small business borrowers. In addition, Islamic banks also have values that encourage the growth of small businesses. On this note, Kuswahariani et al. (2020) looked at each segment, especially the micro-segment. Non-performing loans (NPL)

negatively affect Islamic banks' financial performance (Mustafa, 2019). This research is also supported by Akber (2019), where an increase in NPL of 1% will decrease the net profit margin by 1.066%. Islamic banks are more sensitive to risk than conventional banks. Islamic banks lack risk mitigation expertise (Al Rahahleh et al., 2019). Macroeconomic growth also influences Islamic banks' performance (Ledhem & Mekidiche, 2020). Non-performing loans influence the profitability of Islamic banks (Sitompul & Nasution, 2019). Yusuf, Hamdani, and Kholik (2019) also found that non-performing financing (NPF) significantly affects asset return. Likewise, performance and profitability indicators have a negative significant effect on NPF. However, it is considered that business and CAR have an insignificant effect on NPL (Khan et al., 2020), while moral hazard from Islamic bank actors has a positive influence on NPF (Rodoni & Yaman, 2018). In addition to macroeconomic factors, age, gender, occupation, and financing type influence NPL (Fianto et al., 2019).

Sebtianita (2015) states that in measuring Islamic banks, an Islamic comparison is ideally also used so that there is an appropriate comparison of apple to apple. One possible comparison is the Islamic Index in Indonesia. Yusnita (2019) specifically used the Islamicity performance index. This index uses ratios to measure Islamic banks' financial side and their particular values. Sharia bank efficiency is measured using seven financial ratios. Those ratios are profit sharing ratio, equitable distribution ratio, zakat ratio, employee welfare ratio, director to employee ratio, investment ratio and income ratio.

Setiawan et al. (2020) examined the performance of Islamic banks in Indonesia and compared it with those of Islamic banks in four other countries, especially countries with Islamic characteristics. The result is that each country's most prominent Islamic banks provide positive returns as measured by the value-added economic variable. Setiawan et al. (2020) added a measurement with the aim of justice, Maqasid al Shariah, and found that the most prominent Islamic banks in the five countries positively provided added value in fairness.

According to Farrel (1957), the concept of the overall efficiency of a firm is that it is equal to the product of technical efficiency and price efficiency. A bank's performance is often described in terms of the firm’s efficiency. Techniques for measuring efficiency can be distinguished as either non-parametric or parametric. The difference is the restriction imposed on the optimum frontier, the distributional assumptions imposed on the random errors and terms of inefficiency, and the dispersion in the estimates of average efficiency (Berger & Humphrey, 1997). The bank efficiency measurements are developed through stages. The first measurement indicators are data envelopment analysis. Then it began to become full disposable hull analysis. After that the analysis starts to include the probability and become the stochastic frontier approach. The stochastic frontier are developed with a thick frontier analysis and distribution free approach (Berger & Mester, 1997). Berger and Humphrey (1997) finds that both parametric and non parametric approaches are equally important in research. The DEA method uses efficiency to compare the relative efficiency of banks. Badruzaman (2020) examined the efficiency of Islamic banks in Indonesia. In his research, Hasan (2006) also employs a nonparametric data envelopment analysis (DEA) to calculate the overall, technical, purely technical, allocative, and scale efficiencies of Islamic and conventional banks in Yemen. In this research, the DEA method is used to measure

technical efficiency, and according to Mokhtar et al. (2006) has been used 23 times based on his review of 47 bank efficiency studies.

In order to be more comparable, a performance and efficiency matrix was created. Ideally, efficiency does not reduce performance because efficiency is carried out on activities that do not provide added value. The performance matrix shows four types of Islamic banks. The first is the type of Islamic bank in the lowest matrix, that is, those with low efficiency and performance. The second is the type of Islamic bank with only one prominent indicator: Islamic banks with low efficiency and high performance or Islamic banks with high efficiency but low performance. The last type is ideal: Islamic banks with high efficiency and performance. However, the efficiency of Islamic banks is higher while their margins are lower than those of conventional banks (Shawtari et al., 2019).

Islamic banks also play a positive role in Indonesia's economic growth. Setiawan (2020) shows the positive contribution of Islamic banks by linking the credit provided by Islamic banks and the level of economic growth. The result is a significant relationship between credit provided by Islamic banks and economic growth. On the other hand, Tripuspitorini and Setiawan (2020) bserved how macroeconomic developments influence third-party funds that Islamic banks can collect. The result is a positive relationship between macroeconomic variables and third-party funds that Islamic banks can collect. Therefore, Islamic banks and the Indonesian economy have a mutually influencing and influenced relationship. Nelmida (2020) considers another side of economic conditions: when economic conditions decline, Islamic banks bear financial distress. These findings are consistent with Fortrania and Oktaviana's (2016) findings that almost all Islamic banks in Indonesia remain healthy when experiencing financial distress. Only one Islamic bank is in a grey area or unhealthy position.

A statement can be a hypothesis if the statement can be tested scientifically (Sekaran & Bougie, 2016). Based on the literature review above, eight hypotheses were developed for testing. These hypotheses were built using a regression panel to examine the causal relationship between internal and external factors on the non-performing financing of Islamic banks in Indonesia, as follows:

1. Gross domestic product negative significantly influences the NPF of Islamic banks in Indonesia.
2. The exchange rate positive significantly influences the NPF of Islamic banks in Indonesia.
3. Inflation positive significantly influences of the NPF of Islamic banks in Indonesia
4. The capital adequacy ratio positive significantly influences the NPF of Islamic banks in Indonesia.
5. The financing deposit ratio positively significantly influences the NPF of Islamic banks in Indonesia.
6. The operational efficiency ratio positive significantly influences the NPF of Islamic banks in Indonesia.
7. There is a simultaneous influence between GDP, exchange rate, inflation, CAR, FDR, and OER, on the NPF of Islamic banks in Indonesia.

Meanwhile, the formulation of the hypotheses of the relationship between NPF and technical efficiency is as follows:

H1: "Bad Management": The number of technical efficiency coefficients estimated by Islamic banks is negatively related to non-performing financing.

H2: "Bad Luck": The number of non-performing financing coefficients estimated by Islamic banks is negatively related to the estimated technical efficiency.

RESEARCH METHOD

In this study, quantitative methods were applied. Creswell and Creswell (2018) explains that quantitative research investigates a problem by breaking it to each variable and measuring it using statistical procedures. This study focuses on factors that influence NPF. With efforts to measure the performance of Islamic banking, researchers have examined overall technical efficiency and its relationship with NPF. The measurement approach used was overall technical efficiency (OTE). Table 1 presents the measurement variable in this research.

Table 1. Measurement Variable

Variable	Operational Definition	Formula	Measuring Scale
Dependent Variables			
Non-Performing Loan (NPF)	Problematic financing reflects the large number of loans that cause problems and are difficult to collect. Increasing the NPF value has an impact on the poor performance of Islamic banks because it will eliminate the opportunity to obtain income from the financing provided so that profitability will be disrupted (Fahmi, 2014).	Total Bad Financing / Total Financing	Ratio
Independent Variables			
Gross Domestic Product (GDP)	Gross Domestic Product indicates the economic growth of a country important indicators in seeing the economic performance of economic actors in providing goods and services services including the banking industry are included (Popita, 2013).	$GDPt-GDPt\ n-1/$ $GDPt\ n-1$	Ratio
Exchange Rate	Growth in a firm refers to an increase in assets, mainly the amount of money allocated to its assets (Utami & Pernamasari, 2019)	(Total assets – Total assets$_{-1}$) / Total assets$_{-1}$	Ratio
Inflation	Inflation causes a continuous increase in general prices in the economy which has an impact on reducing people's real income, thereby weakening customers' financial ability to pay banks (Effendi et al., 2017).	(P1 - Po) / Po *P1* = the price of goods and services at the end of the period *Po* = price of goods and services at the beginning of the period	Ratio
Finance to Deposit Ratio (FDR)	Finance to Deposit Ratio can be defined by comparing the financing provided by the bank and third parties managed by the bank in its operations (Farika et al., 2018).	Total Financing will be offered / Third Party Funds	Ratio
Operational Efficiency Ratio (OER)	The Operational Efficiency Ratio is a ratio implemented to determine the level of bank operational efficiency, a high OER ratio will have an increasingly inefficient impact on bank operational costs (Taswan, 2010).	Total Operating Costs/Total Operating Income	Ratio

Source and Data Collection Method

Secondary data were taken from Islamic commercial banks, consistently published by Bank Indonesia and the Bankscope database for the 2015 – 2020 period for all research variables. Based on the criteria, the researchers chose six banks, i.e: BNI Shariah, Mega Shariah, Mandiri Shariah, BCA Shariah, Bukopin Shariah, and BRI Shariah. This study used two methods of data collection: a literature study and a documentary. A literature review was done using the literature and other library materials such as articles, journals, books, and previous studies. Furthermore, a documentary study was obtained from the website of each Islamic bank. Sampling was carried out by purposive sampling; a certain number of samples were drawn from the issuer population using specific considerations or criteria (Sugiyono, 2017). The panel data type was used in this study, combining time-series data with cross-sectional data (Firdaus, 2020; Widarjono, 2009) and increasing the number of data and the degrees of freedom (Hsiao, 2014).

Analysis Design and Hypothesis Testing

Analysis Design

Data processing was performed using EViews and data envelopment analysis (DEA). The analytical technique used in this study was a multiple linear regression. The dependent variable used was NPF (*Y*), and the independent variables were GDP (*X1*), exchange rate (*X2*), inflation (*X3*), CAR (*X4*), FDR (*X5*), and OER (*X6*), *e* = residuals, β_o = constant, and β_i = regression line coefficient. Before using all the independent variables, the researchers saw the impact of each independent variable one at a time, then added two independent variables, then three independent variables, etc., until all $X_{\text{-independent}}$ variables were exhausted.

The formulation to identify whether there is a significant influence of the independent variable on the dependent variable using a multiple linear regression model is formulated as follows (Ghozali, 2018):

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

To test the proposed hypotheses, a regression analysis must be performed using a T-test (partial) and an F-test (simultaneous).

Data Envelopment Analysis (DEA) Model

In analyzing the data, the researchers used an application called data envelopment analysis (DEA-CSR) to test the cost efficiency score. DEA processing uses a mathematical program to apply trade-off implications in frontier empirical efficiency (Wasiaturrahma et al., 2020). There are two DEA approaches for measuring efficiency values. The first is the input orientation, while the second is the output orientation.

Eviews 9 VAR Model

Vector Autoregression model is a multivariate model that is used to find the connection between variables and their past values. Vector autoregression will show how banks efficiency and NPF are changing through time. Masykuroh et.al (2020) stated that vector

autoregression could be used to forecast time series and make a dynamic simulation. The VAR equation is as follows:

$$NPF_{l,t} = f_1(NPF_{i,t-1} \ldots NPF_{i,t-n};\ eff_{i,t-1} \ldots eff_{i,t-n}) + e_{it} \quad (1)$$

$$eff_{l,t} = f_2(eff_{i,t-1} \ldots eff_{i,t-n};\ NPF_{i,t-1} \ldots NPF_{i,t-n}) + e_{it} \quad (2)$$

where, e_{it} = error term of vector autoregression model

Equation 1: The dependent variable is NPF and independent variable is cost efficiency (bad management hypothesis)

Equation 2: The dependent variables is cost efficiency and the independent variable is NPF (bad luck hypothesis)

RESULTS AND DISCUSSION

The study observed 36 observations from 2015 to 2020, comprising six Islamic banks. Based on Table 2, the average non-performing financing (NPF) rate over the six years was 2.35%. BRI Shariah recorded the highest NPF rate of 4.99% in 2018, whereas BCA Shariah had the lowest NPF in 2020, as shown in Table 2. Before the COVID-19 pandemic, Indonesia's gross domestic product (GDP) peaked at IDR15.83 trillion in 2019, while its lowest GDP was IDR11.53 trillion in 2015. The rupiah's foreign exchange rate against the United States dollar was IDR14,481/USD in 2018 and IDR11,526 in 2015. This study employed an inflation rate of 2.92%, with the lowest inflation rate of 1.68% recorded in 2020 during the COVID-19 pandemic and the highest inflation rate of 3.61% in 2017.

Table 2. Descriptive Statistics of Dependent and Independent Variables

	NPF	GDP	Rate	Inflation	CAR	FDR	OER
Mean	2.35	13.94	13.88	2.92	21.59	86.93	91.61
Median	1.75	14.22	13.85	3.08	19.64	83.30	91.66
Max	4.99	15.83	14.48	3.61	45.26	196.73	109.62
Min	0.01	11.53	13.44	1.68	12.85	63.94	81.26
Std. Dev.	1.55	15.98	0.35	0.63	73.72	20.52	59.97
Observations	36.00	36.00	36.00	36.00	36.00	36.00	36.00

Descriptive Statistics

The average Capital Adequacy Ratio (CAR) was 21.59%, which is considered healthy. However, some banks had a lower CAR of 12.85%, while BCA Shariah had a CAR of 45.26%. The financing-to-debt ratio (FDR) reflects the amount of financing compared to the value of debt. The average FDR was 86.93%, with Bank Mega Shariah recording the lowest FDR of 63.94% and Bank Bukopin Shariah recording the highest FDR of 196.73%. The average operational efficiency ratio (OER) of Islamic banks was 91.61%, with Bank BNI Shariah recording the lowest OER of 81.26% in 2019 and Bank Bukopin recording the highest OER of 109.62% in 2016.

Normality Test

If the Jarque-Bera exceeds the significance level of 0.05, the data will be normally distributed. The results above show that the Jarque-Bera probability value is significant at 0.6647, or more than 0.05. This ensured that the data were normally distributed and followed the standard normality test.

Multicollinearity

The test results (shown in Table 3) indicate that the data does not have a multicollinearity problem. The highest matrix value is between the exchange rate and GDP, with a value of 0.5811 or less than 0.7.

Table 3. Multicollinearity Test

	GDP	Rate	Inflation	CAR	FDR	OER
GDP	1	0.5811	-0.5933	0.2048	0.0014	-0.2938
Rate	0.5811	1	-0.3647	0.0847	0.0400	-0.1606
Inflation	-0.5933	-0.3647	1	-0.2150	-0.1537	0.3029
CAR	0.2048	0.0847	-0.2150	1	0.0533	-0.2021
FDR	0.0014	0.0400	-0.1537	0.0533	1	0.3166
OER	-0.2938	-0.1606	0.3029	-0.2021	0.3166	1

Heteroscedasticity

The heteroscedasticity test was used to test whether the regression model included inequalities with one residual value with other calculations. There is no heteroscedasticity in the panel data model. This model solves the problem of heteroscedasticity in the data. This study did not show any heteroscedasticity.

Autocorrelation

Autocorrelation tests in linear regression models are carried out if the data is time series data. Data can be declared free from autocorrelation symptoms if the results have implications between -2 and +2. The results show that the value of Durbin Watson is 1.36543. Based on these results, no autocorrelation was observed in this study.

Panel Data Model

The fixed effect model was chosen in the model test because, based on the results given in the Hausman test above, it has a probability value of 0.0006 (shown in Table 4). The probability of a smaller 0.05 shows that the relationship is significant and the fixed-effect model is an appropriate model.

Table 4. Fixed Effect Tests

Effect Test	Statistic	df	Prob.
Cross-section F	6.6844	(5.23)	0.0006
Cross-section Chi-4	32.3116	5	0

The multiple regression equation for this model refers to the regression coefficient of each independent variable. Table 5 shows the multiple regression analysis using the fixed-effect model. These results explain the partial estimated coefficients, as seen from the t-test, and the overall contribution of the independent variable (F-test) to the dependent variable in this study. Based on Table 5 above, the following form of regression equation can be described:

$$NPF = -8.1824 - 0.1243GDP + 0.1055ExchangeRate + 0.2876Inflation + 0.0523CAR + 0.0123FDR + 0.0848OER$$

Table 5. Multiple Linear Regression Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.1824	3.5717	-2.2909	0.0311
GDP	-0.1243	0.0368	-3.3787	0.0025
EXCHANGE RATE	0.1055	0.0368	2.8638	0.0086
INFLATION	0.2876	0.0956	3.0070	0.0061
CAR	0.0523	0.0233	2.2412	0.0345
FDR	0.0123	0.0024	5.1037	0.0000
OER	0.0848	0.0391	2.1700	0.0401
R^2	0.8571			
Adjusted R^2	0.7915			

The Influence of Gross Domestic Product on Non-Performing Financing

Gross domestic product (GDP) had a significant negative influence on Non-Performing Financing (NPF) with a probability value of 0.0025 or below 0.05, and the first hypothesis is accepted. This shows that if the level of gross domestic product (GDP) decreases, it can also be interpreted as a decrease in the level of the economy. In other words, if there is a decline in the country's economy, it will have an impact on an increase in bad loans and an increase in the ratio of Non-Performing Financing (NPF). The more complex the economic conditions are, the more difficult it will be for creditors to repay loans on time. On the other hand, if the gross domestic product (GDP) increases, creditors will likely have a better economic capacity to repay existing loans. This study's results align with those of Nelmida (2020) and Fortrania and Oktaviana (2016).

The Influence of Exchange Rates on Non-Performing Financing

The regression results show that the exchange rate has a positive significant influence on Non-Performing Financing with a probability value of 0.0086 or below 0.05, meaning the second hypothesis is accepted. This shows that if the value of the rupiah increases in numerical terms but decreases in terms of the exchange rate, it is certain that it will lead to an increase in the ratio of Non-Performing Financing. If a customer's business depends heavily on exports or imports, the foreign exchange rate will influence the customer's performance. Customer performance will influence foreign exchange rates, so foreign exchange rates influence the non-performing financing of Islamic banking. Islamic financing still focuses on small businesses (Kuswahariani et al., 2020). If the weakening of the rupiah exchange rate can be interpreted as an economic decline, then this will also influence the creditors' ability to repay borrowed credit. Sudirman et al. (2022) support this study, arguing that the exchange rate significantly negatively affects NPF.

The Influence of Inflation on Non-Performing Financing

Non-Performing Financing is significantly influenced by inflation with a probability value of 0.0061 or below 0.05. The third hypothesis is accepted. Inflation is a phenomenon of the general and continuous rise of the prices of goods, such as necessities and other items. The declining level of public consumption results in a decrease in a company's production. This means that the company's ability to pay for Islamic financing decreases. Thus, the non-performing financing of customers in Islamic banking will increase. However, this has an inverse effect during the COVID-19 pandemic, where inflation declines as the economy

contracts. This price increase will certainly impact creditors' ability to pay off the loans they borrow on time. Creditors may prioritize other personal economic aspects, such as basic needs, before paying off their loans. According to the research of Rustika (2016), they found an insignificant negative relationship between the inflation rate and the NPF because the value of financing and non-performing loans in Islamic banks was still relatively small in nominal terms compared to conventional banks.

The Influence of Capital Adequacy Ratio on Non-Performing Financing

The capital adequacy ratio significantly positively influenced Non-Performing Financing with a probability value of 0.0345 or below 0.05, and the fourth hypothesis is accepted. This shows that an increase in the capital adequacy ratio also increases the Non-Performing Financing ratio. The level of non-performing loans owned by banks is significantly influenced by the availability of bank capital. Careless management can lead to detrimental decisions and increase the risk of NPLs. The increase in this ratio protects depositors and increases financial stability in the face of an increase in the Non-Performing Financing ratio. The lower the capital adequacy, the lower the ability of banks to minimize risk in burdening financing, so the potential for non-performing financing that occurs in banks will be higher (Purnamasari & Musdholifah, 2018). The result of this research is different with Purwanto (2021) where the increase in CAR due not directly affected the NPF and hence the relationships between CAR and NPF is not significant.

The Influence of Financing Deposit Ratio on Non-Performing Financing

Non-Performing Financing is also significantly influenced by the Financing Deposit Ratio variable with a probability value of 0.0000 or below 0.05, which means the fifth hypothesis is accepted. In order to measure liquidity of Sharia banks, the comparison between the financing and the part of financing is categorized as deposit. The more part is categorized as deposit it means that the saver is more prone to take the fund and it will affect bank liquidity. Research by C. Setiawan & Sherwin (2017) found that FDR had a negative significant effect toward NPF. It means that the increase of loans given by Sharia banks does not increase the NPF of Sharia banks. In other words the sharia banks succeeded in giving a quality loan and hence increased Sharia bank efficiency.

The Influence of Operational Efficiency Ratio on Non-Performing Financing

The operational efficiency ratio had an insignificant positive influence on Non-Performing Financing variable with a probability value of 0.0000 or below 0.05, causing the sixth hypothesis to be rejected. The increase in the operational efficiency ratio and non-performing financing could be due to banks requiring additional costs to collect back funds they lent to creditors or third parties. The increase in the ratio of bad loans also means that companies need to reassess the risks and the company's finances, which may incur extra costs. Therefore, operation efficiency can lead to cost savings and improved productivity, but it does not guarantee better credit risk management. Credit risk assessment and loan origination decisions are separate from operational efficiency.

Simultaneous Influence of All Independent Variables on Non-Performing Financing

Based on the results of multiple regressions, the F-statistics probability value is 0.0000 or lower than 0.05. These results indicate that all independent variables simultaneously influence Non-Performing Financing, and thus the eighth hypothesis is accepted. The influence of all independent variables in this study is indicated by the adjusted R-squared value of 79.15%.

The Most Influential Factors on Non-Performing Financing

The most significant influence of the independent variable on Non-Performing Financing can be ordered from the probability value in the t-statistical analysis. The closer the probability values are to 0, the greater the mathematical influence of the independent variable is. The results show that the Financing Deposit Ratio variable had the most significant influence among the other independent variables in this study.

Results of Data Envelopment Analysis

The Islamic banks selected as samples in this study can be said to have optimal technical efficiency based on DEA results if the specified value is equal to one. The researcher has summarized the overall results of processing the efficiency data of Islamic banks, namely the research samples, into a table. Each observation was arranged sequentially for each year to obtain the comparison results. The results of the data processing are as follows:

Table 6 shows the level of efficiency based on the technical efficiency scores of six Islamic banks from 2015 to 2020. The findings show that all the Islamic banks sampled in this study have an average efficiency value of 0.94 or 94%. During the studied period, the researchers noted that BCA Shariah, BRI Shariah, and Bank Bukopin Shariah managed to be fully efficient with a score of 1.00 for six consecutive years. Meanwhile, BNI did not achieve an efficiency score of 1.00 in 2020. On a similar note, Bank Mega Shariah also did not achieve an efficiency score of 1.00 from 2018 to 2020. Meanwhile, Bank Mandiri Shariah never achieved full efficiency during the six years. This makes Bank Mandiri's average efficiency score the lowest among the Islamic banks sampled for that period. To achieve full efficiency, BNI Shariah, Bank Mandiri Shariah, and Bank Mega Shariah or their companies that did not achieve efficiency need to refer to BCA Shariah, BRI Shariah, and Bank Bukopin Shariah in the following years because they have the same company characteristics.

Table 6. Technical Efficiency Test

Period	Name of Sharia Bank						Average	MAX	MIN
	BCA	BNI	BRI	Bukopin	Mandiri	Mega			
2015	1.00	1.00	1.00	1.00	0.65	1.00	0.94	1.00	0.65
2016	1.00	1.00	1.00	1.00	0.62	1.00	0.94	1.00	0.62
2017	1.00	1.00	1.00	1.00	0.76	1.00	0.96	1.00	0.76
2018	1.00	1.00	1.00	1.00	0.79	0.98	0.96	1.00	0.79
2019	1.00	1.00	1.00	1.00	0.89	0.89	0.96	1.00	0.89
2020	1.00	0.94	1.00	1.00	0.77	0.63	0.89	1.00	0.63
Average	1.00	0.99	1.00	1.00	0.75	0.92	0.94	1.00	0.75
MAX	1.00	1.00	1.00	1.00	0.89	1.00			
MIN	1.00	0.94	1.00	1.00	0.62	0.63			

The results (see Table 7) show no reciprocal relationship between efficiency and Non-Performing Financing (NPF) because the probability value is higher than 0.05. Thus, the efficiency level of Islamic banks will not be influenced by the Non-Performing Financing (NPF) ratio, and vice versa. This shows that this study did not prove the "Bad Luck" and "Bad Management" hypotheses.

Table 7. Efficiency and Non-Performing Financing Relationship Test

Null Hypothesis	Obs	F-Statistic	Prob
EFF does not Granger Cause NPF	30	3.2519	0.0825
NPF does not Granger Cause EFF		0.3534	0.5771

The results obtained (shown in Table 8) indicate that the efficiency score does not significantly influence Non-Performing Financing (NPF), but has a negative sign. This means that if the Non-Performing Financing (NPF) ratio increases, it cannot be ascertained that it will affect the decline in bank efficiency because the effect is insignificant.

Table 8. VAR Regression Test

Variable	Coefficient	Std.Error	t-Statistic	Prob
C	-0.2292	0.1455	-1.5745	0.1266
D(EFF)	-1.4359	1.8816	-0.7631	0.4518

CONCLUSION

This research proved that three direct hypotheses on job satisfaction had a positive effect. However, the The influence of the partial significance of each independent variable on the dependent variable can be concluded as follows: Gross Domestic Product negatively significant influence NPF, that indicates an increase in GDP will decrease the NPF ratio, meanwhile the Exchange rate has a sign positive on NPF, but insignificant. This result indicate the fluctuation of exchange rate does not change the value of the NPF ratio. There are several variables such as Inflation, CAR, Financing Deposit Ratio positively significant influence NPF. Prices increase can lead to an increase on NPF; CAR has significant increase and the portfolio management is not run well can lead the increase of NPF; The high Financing Deposit Rate allows for an increase in the NPF ratio.The results of the F-statistical test show that all the independent variables simultaneously influence Non-Performing Financing. All independent variables can explain 78.26% of the variation in Non-Performing Financing changes, while other factors outside this study may influence the rest. In this study, the Financing Deposit Ratio had the most significant From 2015 to 2020, the average technical efficiency of the Islamic banks sampled in this study was 0.95% or 95%. BCA Shariah, BRI Shariah, and Bank Bukopin Shariah achieved total efficiency. Meanwhile, Bank Mandiri Shariah was the least efficient during that period.

The efficiency and Non-Performing Financing scores did not show a reciprocal relationship in the VAR test. Efficiency also did not significantly influence Non-Performing Financing but had a negative or opposite influence. This means that a decrease in efficiency could cause an increase in the ratio of Non-Performing Financing and vice versa. In other words, the hypotheses of "Bad Luck" and "Bad Management" did not have enough evidence.

This study has limitations in terms of both financial and economic variables as well as input and output variables. A larger sample or population input is suggested for future

researchers to achieve better diversification for further studies. The observation period can also be diversified to compare the results of previous studies. Future researchers are expected to add more independent variables from various aspects that can provide better research results and new findings. Researchers can also add more input and output variables to measure the efficiency of the sample so that it can provide more detailed efficiency values.

This study is also expected to serve as a reference for Islamic banking in Indonesia and a useful literature for future research development. This research will also provide added scientific value in the field of Shariah. This addition will also further support the growth of Islamic banks in Indonesia, particularly since research in Shariah banks is still limited. This research will also add knowledge to the financial industry in general. Moreover, the results of this study can also be used by Islamic commercial banks and regulatory agencies to improve the Islamic banking NPF model while assessing the efficiency of Islamic banking and improving the quality of governance in the banking industry.

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