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Risk and Return Analysis of Bank Muamalat Indonesia Financing Using *VaR* and *RAROC* Methods

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ABSTRACT
This research aims to measure the potential risk and potential return as well as the application of the high risk high return principle of murabahah, mudharabah and musyarakah financing at Bank Muamalat Indonesia for the 2019-2023 period. The calculation technique uses the VaR and RAROC methods. The results of the analysis show that murabahah financing has the smallest potential risk and mudharabah financing has the greatest potential risk. This can be seen from the magnitude of the VaR (Mean) and VaR (Zero) values. Throughout the year period the VaR value always shows a negative value, which means it shows the potential return. In line with VaR calculations, positive RAROC method calculation results indicate potential returns that are adjusted to have potential profits due to income received being greater than the value of expected losses. Meanwhile, the application of high return, high risk is not in accordance with the potential risk and return as measured by the RAROC method. The RAROC value which indicates the largest return is in 2022, while the equivalent rate which indicates the smallest return (biggest risk) is in 2019.
Keywords: *Risk, Return, Value at Risk (VaR), Risk Adjusted Return on Capital (RAROC)*

INTRODUCTION

Banks are financial institutions that play a vital role in a country's economy. Banking in Indonesia operates under two systems: conventional banking and Sharia banking. The existence of Sharia banks within conventional banking offers an alternative banking system for those seeking banking services without the worry of interest (riba). Sharia banks were established with the aim of promoting and developing the application of Islamic principles and traditions in financial and banking transactions and related businesses. These transactions include fundraising, fund placement, and other service transactions. One such fund placement transaction is financing.

Financing distribution naturally carries risks. Risk is the uncertainty that must be faced regarding something that has the potential to cause loss. Essentially, risk is an inseparable part of everyday life. Risk is present in everyday life, whether we realize it or not. Therefore, in any business activity, there is always the potential for risk. Sharia banks in Indonesia, particularly Bank Muamalat Indonesia (BMI), are no exception, as they may also face potential credit or financing risks. One form of financing risk can be examined through Non-Performing Financing (NPF). Changes in financing and Non-Performing Financing (NPF) can be more clearly seen using the following graph.

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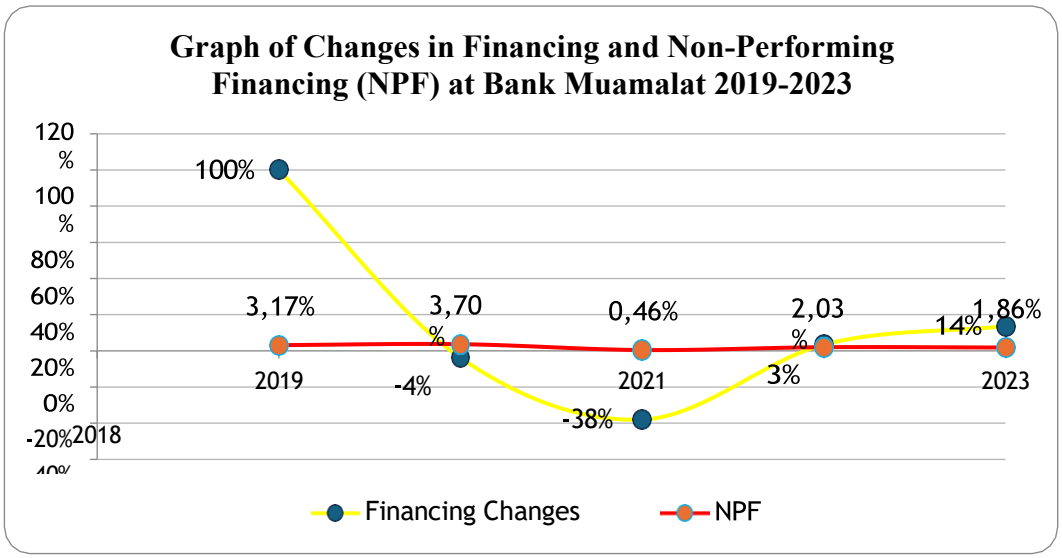

Figure 1. Graph of Changes in Financing and Non-Performing Financing (NPF) at Bank Muamalat 2019-2023

Source: Bank Muamalat Indonesia Financial Report, processed data.

In addition to potential risks, Bank Muamalat Indonesia also has the potential for returns on its financing. (Ghozali, 2007) states that returns are the income received when someone invests money in a financial or real asset. Financing returns are obtained from equivalent rate data, or in other words, the equivalent rate is the return on financing under Sharia law. The average financing return at Bank Muamalat Indonesia can be more clearly seen in the following graph.

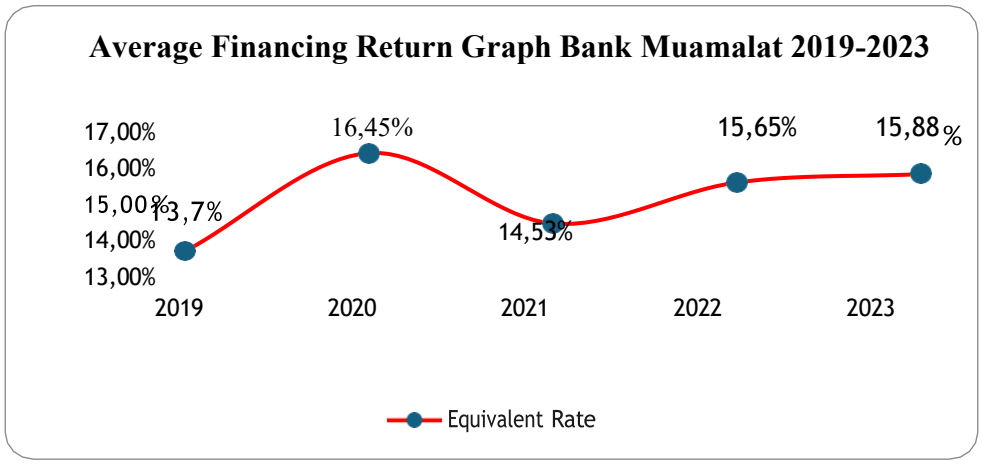

Figure 2. Average Financing Return Graph Bank Muamalat 2019-2023

Source: Bank Muamalat Indonesia Financial Report, processed data.

From 2019 to 2023, Bank Muamalat's returns tended to decline in 2021, in line with the decline in financing. In 2021, returns decreased from 16.45% the previous year to 14.53%. However, in 2020, returns increased from 13.77% to 16.45%. In 2022, returns

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also increased from 14.53% to 15.65%. Between 2019 and 2023, both the financing amount, the NPF value, which indicates the risk level, and the return, measured by the equivalent rate, fluctuated. However, these fluctuations were not unidirectional. For example, in 2020, Bank Muamlat Indonesia's financing amount decreased, but the NPF and Equivalent Rate increased. Then, in 2023, the financing amount and the equivalent rate increased, but the NPF decreased. The ideal situation is that as financing amounts increase, risk levels increase, and returns also increase along with the increase in financing amounts. This is due to the unidirectional relationship between risk and return on financing products at Islamic banks in Indonesia.

There are differences in research on the potential risk and return in Islamic bank financing products conducted by Rahman and Saputri (2021), Prastiwi (2020), Budiasih et al. (2020), and Ningsih and Ali (2021). From the differences in research that has been conducted and business phenomena, namely the difference in the direction of the relationship between the amount of financing, NPF value, and Equivalent Rate during the 2019-2023 period at Bank Muamalat Indonesia, the formulation of the research problem is as follows: "How to measure the potential risk and return on investment in financing products at Bank Muamalat Indonesia for the 2019-2023 period"

Several methods exist to measure potential financing risk and potential returns in Islamic banks. Researchers use the Value at Risk (VaR) and Risk Adjusted Return on Capital (RAROC) methods. A study by Rahman and Saputri (2021) found that, based on Value at Risk (VaR) calculations, murabahah financing has the lowest risk with a relatively stable value, while musyarakah financing has the highest risk. Furthermore, the analysis of potential losses against returns based on the RAROC (Return-to-Return Option) indicates a potential loss due to the negative RAR value, which would negatively impact Bank Syariah Mandiri. If realized losses occur, these losses would erode Bank Syariah Mandiri's capital to cover them.

VaR (Value at Risk) and RAROC (Risk Adjusted Return on Capital) are important tools for assessing risk and returns in Islamic banks, including Bank Muamalat Indonesia (BMI). VaR measures the maximum potential loss that may occur within a given period with a certain level of confidence, helping Islamic banks understand the financial risks they face from products such as mudharabah deposits. RAROC measures returns adjusted for the risk taken, thus providing an indicator of the efficiency and profitability of capital

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allocated to the bank's business activities. With RAROC, BMI can assess the extent to which its capital is optimally utilized to generate returns with controlled risk, helping with strategic decision-making and better risk management. VaR focuses on measuring the risk of potential losses, while RAROC assesses the profitability of capital by considering that risk, making it crucial for risk management and evaluating the financial performance of Islamic banks like BMI.

According to Ningsih et al. (2021), potential risk can be measured using the VaR method, and potential returns can be measured using the RAROC method. Furthermore, in a 2018 study conducted by Ridiawati, it was observed that investments in the form of deposits at Bank Syariah Mandiri, calculated using the VaR (Value at Risk) approach, have risks and the level of income the bank earns from its business activities, adjusted for risk using the RAROC calculation method. RAROC is a modern credit risk measurement method. Furthermore, Prastiwi (2020) stated that Bank BRI Syariah has prospective value, as evidenced by the level of risk and net returns during the study period. Therefore, the VaR method can be used to identify and quantify risk in the research object. Furthermore, Budiasih C. Cusyana (2020) explained in her research that the VaR and RAROC methods can be used as tools to measure potential risk and return.

Empirical evidence on risk and return assessment in Islamic banks indicates that financing fluctuations impact the credit risk faced by banks, while the Non-Performing Loan (NPF) indicates the level of non-performing financing, which directly reflects asset quality and default risk. The equivalent interest rate in Islamic banks serves as an indicator of the cost of capital and investment returns, which influence bank profitability. The research gap arises because many studies have not integratively examined the dynamic relationship between these empirical variables and financial risk measures such as VaR and RAROC, and their impact on Islamic banks' financial performance.

Existing research often focuses on a single aspect of risk or return without incorporating the empirical variables of financing fluctuations, NPF, and the equivalent interest rate as key determinants of risk and profitability. This results in a lack of a comprehensive understanding of how these variables interrelate and influence the effectiveness of risk measurement and decision-making in Islamic banks.

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Based on the above explanation, research is needed to determine the risk and return of Bank Muamalat Indonesia (BMI) financing products using the VaR (Value at Risk) and RAROC (Risk Adjusted Return on Capital) approaches.

THEORETICAL BACKGROUND

Modern Portfolio Theory (MPT) was developed by Harry M. Markowitz (1952). The essence of this theory is building an investment portfolio by selecting a combination of assets that provides the highest return for a given level of risk, or conversely, minimizes risk for a given level of expected return. MPT introduces quantitative concepts of diversification and the trade-off between risk and return. The basic assumption of this theory is that rational investors maximize utility based on expected return and variance/standard deviation (risk). The analysis is usually single-period (one time horizon). Asset returns are assumed to be sufficiently explained by the mean and variance (often assumed to be normal or with quadratic utility). Ideally, markets exist with no transaction costs, no taxes, symmetric information, and homogeneous investors (in the basic form of MPT). Assets can be traded fractionally; short selling is permitted unless restricted.

The relevance of Modern Portfolio Theory to Islamic financing is the underlying principles of Modern Portfolio Theory itself, including the risk-return trade-off: the higher the risk, the higher the potential return, and the Efficient Frontier: choosing the best portfolio (maximum return for a given risk, or minimum risk for a given return). This principle is in line with “Al-ghunm bi al-ghurm”; There is no profit without bearing risk, and “Risk sharing”; in profit-sharing contracts (mudharabah, musyarakah), profits and losses are shared according to the ratio and portion of capital.

The principle of "al-ghunm bi al-ghurm" (risk accompanies benefit) implies that when someone seeks to obtain a benefit, they must be prepared to bear the risks involved in the process. According to Umar Abdullah al-Kamil, the implicit meaning of this principle is that whoever obtains a benefit is responsible for the harm and daman that may occur. The principle of "al-ghurmu bi al-ghunmi" (harm) means that anyone who benefits from something must bear the risk. According to Umar Abdullah al-Kamil, the implicit meaning of this principle is that anyone who benefits from something is responsible for the harm and daman that may occur. The principle of al-ghurm bi al-ghunm is a principle

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in Islamic law that emphasizes the concept of justice and risk sharing. This principle implies that in an agreement or economic transaction, the parties involved should not only share profits but also be willing to bear any risks that may arise.

According to the principle of al-ghunm bi al-ghurm, risk accompanies benefits. When someone desires to obtain a benefit, they must be prepared to bear the risks that arise during the activity. These contracts in Sharia transactions implement the profit-sharing principle, where the bank and customer both invest capital to run a business, and the profits from this joint venture are distributed either proportionally to their respective capital contributions or according to a mutual agreement (non-proportional), as in a musyarakah contract. If a loss occurs, liability for the loss is borne by the parties, as capital owners, according to their respective capital limits. Furthermore, due to the concept of the al-ghunm bi al-ghurm principle, sharia financing such as musharakah mudharabah in sharia banking is vulnerable to risk, in fact this factor is the reason why not many sharia banks are not yet/even not interested in applying musharakah financing.

The high-risk-high-return principle generally states that the higher the risk taken, the higher the potential return. However, this principle does not fully apply in the context of Bank Muamalat Indonesia (BMI), which predominantly uses murabahah financing as its primary instrument. Financing such as murabahah is predominantly characterized as a low-risk financing product due to its sale-based nature with a pre-agreed profit margin. In murabahah, the financing risk is relatively lower compared to other types of profit-sharing financing such as mudharabah or musyarakah because payments and profits are predetermined from the outset and are not directly related to fluctuations in the customer's business profits.

Therefore, although murabahah generates stable and relatively low-risk returns, it does not offer the potential for high returns typically expected from high risk. Therefore, at BMI, this product structure creates a discrepancy with the high-risk-high-return principle, as the bank prioritizes the stability and certainty of returns from low-risk murabahah financing. This also reduces the risk volatility in BMI's financing portfolio, so that the VaR value and return risk that must be calculated are also different from banks that use a lot of high-risk-based financing.

A Sharia Bank is a bank that conducts its business activities based on Sharia principles. According to its type, Sharia banks consist of Sharia Commercial Banks

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(BUS), Sharia Business Units (UUS), and Sharia Rural Financing Banks (BPRS). Therefore, Sharia bank operations are strictly determined by Sharia principles; no product may conflict with Sharia.

Funding distribution through financing products is divided into four contract categories, differentiated by their intended use: sale-purchase financing, lease financing, profit-sharing financing, and other complementary financing contracts. Sale-purchase financing includes receivables held by the company, such as murabahah receivables. Profit-sharing financing in Sharia banking has four contracts: musyarakah, mudharabah, muzara'ah, and musaqah. However, the most frequently used financing contracts are musyarakah and mudharabah, while muzara'ah and al-musaqah are typically used for agricultural financing at Islamic banks.

A murabahah contract is a sale and purchase agreement for an asset, confirming the purchase price to the buyer, and the buyer paying a premium as a margin. A mudharabah contract is a business cooperation agreement between one party (malik, shahibul mal, or Islamic bank) who provides all the capital and a second party (amil, mudharib, or customer) who acts as the fund manager, with an agreement outlined in the contract. Losses are borne entirely by the Islamic bank unless the second party commits intentional error, negligence, or breach of the agreement. According to (Anggraini, 2021), musyarakah is a cooperation agreement between two or more parties for a specific business, where each party contributes funds (or charity/expertise) with the agreement that profits and risks will be shared according to the agreement.

To manage and mitigate risks in Islamic Commercial Banks and Islamic Business Units through risk identification, measurement, monitoring, and control processes in accordance with Islamic banking business activities and considering compliance with Islamic principles, the Financial Services Authority (OJK) issued Circular Letter No. 25/SEOJK.03/2023 concerning the Implementation of Risk Management for Islamic Commercial Banks and Islamic Business Units. This OJK Circular Letter is an implementing provision of Financial Services Authority Regulation No. 65/POJK.03/2016 concerning the Implementation of Risk Management for Islamic Commercial Banks and Business Units.

According to Ghozali (2007), return is the income received if we invest money in financial assets such as stocks or bonds or in real assets such as property or land. The

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Equivalent Rate is an indicative percentage rate used to facilitate customer understanding of interest calculations in Islamic banks. The equivalent rate calculation uses information on the number of days in a year and the number of days in a month (Yaya et al., 2009).

METHOD, DATA AND ANALYSIS

In this study, the author used a quantitative approach. According to Cresweel (2013), this quantitative approach involves predetermined research, statistical data analysis, and statistical interpretation. Researchers using a quantitative approach test a theory by detailing specific hypotheses and then collecting data to support or refute these hypotheses. The approach used in this study is a quantitative analysis approach based on statistical information.

This study uses a descriptive method, which aims to explain and summarize various conditions, situations, or variables that arise in the community being studied based on actual events. The researcher uses a descriptive method to examine the measurement of financing risk and return, referring to non-performing financing, risk-adjusted return, and risk capital. The type and sources of data used in this study are quantitative data from Islamic bank financial reports, including Islamic bank financing data and equivalent rates. The data collection method is a documentary study. This study uses secondary data derived from Bank Muamalat Indonesia's financial reports, obtained from the official website of Bank Muamalat Indonesia (www.bankmuamalat.co.id/) in Indonesia for the period 2019-2023.

The research object, Bank Muamalat Indonesia (BMI), was chosen because it met criteria appropriate to the phenomenon being studied. The researcher established criteria or considerations that the research object must meet. For example, it must be a sharia bank offering murabahah, mudharabah, and musyarakah financing products. Furthermore, the research object must have and disclose annual reports and financial statements for the research period, from 2019 to 2023. Specifically, the researcher chose Bank Muamalat Indonesia because, in addition to meeting the aforementioned requirements, BMI is the first sharia commercial bank in Indonesia. Therefore, it not only offers financing products but is also considered a pioneer of sharia financing products for other sharia commercial banks. Furthermore, Bank Muamalat Indonesia's existence since 1992, or 32 years of existence, has attracted researchers' interest in understanding its risk

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management and returns.

The presentation of descriptive statistical data in the form of diagrams or tables consisting of mean, median, maximum, minimum, and standard deviation values purposes to describe the data obtained. Broadly speaking, descriptive statistical analysis is used to describe the distribution and behavior of the research sample data, as seen from the mean, maximum, minimum, and standard deviation values of each variable.

This study uses *return* data obtained from *equivalent rates* for *mudharabah, musyarakah*, and *murabahah* financing. This equivalent rate data is then used to find the financing. The obtained equivalent rate data is transformed into *natural logarithmic* (In) form and calculated using the following equation:

$$R_t = \frac{P_t}{P_t - 1}$$

Where:

R_t = Return of period i
P_t = Price at time t
P_t - 1 = Price at time t – 1

Before entering the VaR calculation, the financing data to be processed must first be tested. This test is necessary to determine the characteristics of mudharabah, musyarakah, and murabahah financing. The test used is a stationary test, used only to determine whether the data used is stationary. The stationary test is performed using the Augmented Dickey Fuller (ADF) test using e-views 10 software. The stationary test on time series data indicates that the data has a relatively constant average. This is because stationary data typically fluctuates around that average. Data is considered stationary if the ADF does not exceed 5%.

Basri (2008) states that the net risk weight measurement method is calculated by estimating the percentage of potential losses using the VaR absolute and relative values.

$$\boldsymbol{VaR\ (mean) = A0,* \alpha * \sigma * \sqrt{t}}$$
$$\boldsymbol{VaR\ (zero) = A0,* (\alpha * \sigma * \sqrt{t} - \mu * t)}$$

Where:
A0 = Exposure value
α = Confidence level
σ = Standard deviation
√t = time
μ = Expected return

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The absolute VaR value is the loss relative to zero, and the relative VaR value is the loss compared to the average expected return (μ). A VaR of zero represents the difference between VaR and the average gross expected return. If a VaR of zero is positive and significant, there is potential for financing losses, and if a VaR of zero is negative, there is potential for financing profitability. Assuming an amount A0, given the annual return rate, the value of the portfolio A = A0, (1 + R), the expected rate of return from the portfolio is μ with a standard deviation. VaR answers the question of how much a portfolio can suffer a loss in time period t.

In this study, A0 represents the annual financing exposure for the period 2019 to 2023. The confidence level is determined by the standard normal distribution value a, which can be found in the normal distribution table. For a 95% confidence level, the Z value is 1.65, and for a 99% confidence level, the Z value is 2.33. In this study, the confidence level used to measure VaR is 99% with a Z-value of 2.33 because a higher confidence level is preferable in VaR calculations. Standard deviation measures the percentage of the distance or fluctuation from the average value of the expected return.

In this study, the standard deviation is the sum of the squares of the equivalent rate variable minus the mean value of the equivalent rate variable divided by the number of monthly periods in a year. The expected rate of return is used to measure the average estimated probability of a financing return. For this study, the expected rate of return is calculated from the mean value of the equivalent rate variable over the monthly periods in a year.

After the VaR calculation is complete, the RAROC calculation is performed. The RAROC ratio tests the Risk Adjusted Return (RAR) factor with Risk Capital (RC). Several variables are used in measuring RAROC: the difference between total revenue and total cost, the expected loss, and the worst-case loss. In measuring RAROC, the rate of return and the level of capital are adjusted for risk, thus providing an explanation of net profitability. RAROC can be calculated using the following equation:

$$\mathbf{RAROC} = \frac{RAR}{RC} = \frac{TR-TC-EL}{WL-EL}$$

Information :
RAR = Risk Adjusted Return
RC = Risk Capital
TR = Total Revenue
TC = Total Cost

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EL = Expected Loss
WL = Worst Case Loss

Risk Adjusted Return (RAR) indicates the return adjusted for the level of risk. Risk Capital (RC) represents the amount of risk that erodes capital. In this study, the RAR variable can be calculated from three variables: total revenue, total cost, and expected loss. According to Damanik and Sangsoko (2010), Total Revenue or total income is the amount of revenue received from the sale of goods and/or services. Total Revenue, also known as total income, is the amount of income earned by a business from all sales before deducting costs and expenses. Total income can also include interest and dividends from investments. According to Damanik and Sasongko (2010), Total Cost can also be defined as the total costs incurred, both explicit and implicit, on resources to achieve a certain level of output. Total Revenue and Total Cost indicate the level of efficiency, the level of profit or loss, and the optimal level of output.

The expected loss value can be determined using the NPF variable. This is based on Bank Indonesia Regulation (PBI) as stipulated in Bank Indonesia Regulation No. 13/13/PBI/2011 concerning Asset Quality Assessment for Sharia Commercial Banks and Sharia Business Units. Based on the default probability provisions for each collectibility, the expected loss value can be calculated by multiplying the financing exposure value by the default probability as stipulated in PBI No. 13/13/PBI/2011.

The worst-case loss (EL) value indicates the likelihood of the worst or maximum loss. In this study, WL is measured using the EL (expected loss) variable and estimated with a confidence level of 95%, with a probability of 5%. The WL estimate against the confidence level can be formulated as follows:

$$WL = EL + \frac{Zc\sigma}{\sqrt{N}}$$

Where:

WL = Worst Case Loss
EL = Expected Loss (average value of the NPF distribution)
Z = c value in the normal distribution table
C = Confidence level
σ = Standard deviation
N = Number of values

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RESULTS

Measuring the financing risk at Bank Muamalat Indonesia can first be seen from the financing composition at Bank Muamalat Indonesia in the period 2019 to 2023. Financing at Bank Muamalat Indonesia for the period 2019 to 2023, especially for murabahah contracts, mudharabah contracts, and musyarakah contracts, has the following financing composition.

Table 1: Composition of Murabahah, Mudharabah, and Musyarakah Financing at Bank Muamalat Indonesia for the 2019-2023 Period

(in millions of Rupiah)

		Financing			Average Total Financing
No	**Periode**	**Murabahah**	**Mudharabah**	**Musyarakah**	Per Year
1.	2019	14.138.127	756.514	14.206.884	9.700.508
2.	2020	12.880.811	620.075	14.478.476	9.326.454
3.	2021	7.700.646	526.140	9.122.394	5.783.060
4.	2022	6.695.153	564.059	10.694.846	5.984.686
5.	2023	5.851.614	583.887	13.961.666	6.799.056
Average of Each Financing		9.453.270	610.135	12.492.853	**7.518.753**

Source: Bank Muamalat Indonesia Annual Report 2019-2023

The data above shows that in 2019, Bank Muamalat Indonesia had an average total financing of Rp. 9,700,508,000,000.00. In 2020, it was Rp. 9,326,454,000,000.00. In 2021, it was Rp. 5,783,060,000,000.00. In 2022, the average total financing was Rp. 5,984,686,000,000.00. In 2023, it was Rp. 6,799,056,000,000. It can be seen that Bank Muamalat Indonesia disbursed the largest amount of funds through musyarakah contracts, followed by murabahah contracts, and the smallest amount through mudharabah contracts. Meanwhile, the average for each financing, namely for Murabahah contracts, is Rp. 9,453,270,000,000.00. For Mudharabah contracts, the average is Rp. 610,135,000,000.00. Meanwhile, for Musharakah contracts, the average is Rp12,492,853,000,000.00.

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Table 2: Equivalent Rate at Bank Muamalat Indonesia for the 2019-2023 Period

No.	Periode	*Equivalent Rate* (ER) (%)			Average ER of All Financing Per Year
		Murabahah	Mudharabah	Musyarakah	
1.	2019	15,04	9,95	16,32	13,77
2.	2020	18,85	10,37	20,14	16,45
3.	2021	14,88	9,76	18,94	14,53
4.	2022	17,12	10,21	19,62	15,65
5.	2023	18,26	9,95	19,42	15,88
Average ER of Each Financing		16,83	10,05	18,89	15,26

Source: Bank Muamalat Indonesia Annual Report 2019-2023

The data above shows that the average return or equivalent rate at Bank Muamalat Indonesia fluctuates over time. At Bank Muamalat Indonesia, the return is derived from equivalent rate data, or the equivalent rate is the return on financing at Bank Muamalat Indonesia. In 2019, the average equivalent rate for Bank Muamalat Indonesia was 13.77%. In 2020, the average equivalent rate was 16.45%. In 2021, it was 14.53%. Bank Muamalat Indonesia's average equivalent rate was 15.65% in 2022 and 15.88% in 2023.

For each financing contract, the average equivalent rate for Murabahah contracts was 16.83%. For Mudharabah contracts, it was 10.05%. Bank Muamalat Indonesia then had an average equivalent rate of 18.89% for the Musyarakah contract. It can also be seen that during the research period, the Musyarakah contract had the highest average equivalent rate of 18.89%, followed by the Murabahah contract at 16.83%, and then by the Mudharabah contract which had an equivalent rate of 10.05%. The highest average equivalent rate was in 2020 at 16.45% and the lowest average equivalent rate was in 2019 with a value of 13.77%. For more details, the following is a graph of fluctuations in the average equivalent rate for Murabahah, Mudharabah, and Musharakah contracts at Bank Muamalat Indonesia.

Bank Muamalat Indonesia's Non-Performing Financing (NPF) is a term in Islamic banking that describes non-performing financing or financing that is not running smoothly. NPF is a ratio that measures the proportion of non-performing financing to the total financing disbursed by Islamic banks. In conventional banking terms, NPF is similar to Non-Performing Loans (NPL). Although the average Non-Performing Financing

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percentage is consistently below 5%, it can be said that Bank Muamalat Indonesia is considered healthy because it consistently maintains an NPF below 5%. This is based on Financial Services Authority Regulation No. 15/POJK.03/2016. Furthermore, Bank Indonesia Circular Letter No. 9/24/DPbS of 2007 stipulates that NPF has five levels.

Rank 1 represents a bank with an NPF <2%, which is considered very healthy. Rank 2 represents a healthy rating, which is held by a bank with an NPF of 2% or less than 5%. Banks with an NPF of 5% or less than 8% are ranked 3rd, with a rating of "fairly healthy." Banks with an NPF of 8% or less than 12% are considered less healthy, with a rating of 4. Banks with an NPF of 12% or more are ranked 5th, with a rating of "unhealthy."

Non-Performing Financing (NPF) at Bank Muamalat Indonesia. The Non-Performing Financing (NPF) value fluctuated from 2019 to 2023. From 2019 to 2023, the Non-Performing Financing (NPF) value was ranked 2nd (healthy), with the criteria for a Non-Performing Financing (NPF) value of 2% or less than 5%. The following is a graph of the Non-Performing Financing (NPF) at Bank Muamalat Indonesia from 2019 to 2023.

NPF of each financing institution at Bank Muamalat Indonesia for the period 2019-2023. Murabahah contracts have an average NPF spread compared to other financing options, at Rp346,275,716.00, or 3.82%. Mudhrabah contracts have the smallest NPF, at Rp4,639,134.00, or 2.21%. Meanwhile, musyarakah contracts have an average NPF of Rp299,264,756, or 2.25%. In this study, Non-Performing Financing (NPF) is used in the RAROC calculation, which calculates Expected Loss and Worst Case Loss based on the collectibility of substandard, doubtful, and loss.

Calculating Value at Risk (VaR) involves several steps. The following are the steps for measuring Value at Risk (VaR) for murabahah, mudhrabah, and musyarakah contracts at Bank Muamalat Indonesia. One step in measuring Value at Risk (VaR) is testing the financing return data, or equivalent rate, to determine whether it is stationary and suitable for VaR calculations. Eviews 12 software uses the ADF-Test (Augmented Dickey Fuller) method to test the stationarity of the equivalent rate data. The test method involves comparing ADF-Text values with critical values.

Based on data processing in Eviews 12 software, using the ADF-Test (Augmented Dickey Fuller) method, it can be seen that the equivalent rate data for mudharabah, musyarakah, and murababah financing contracts can be considered stationary. The

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following are the results of processing equivalent rate data in Eviews 12 software using the ADF Test (Augmented Dickey Fuller) method.

The equivalent rate results for murabahah, mudharabah, and musyarakah contracts are declared stationary because the ADF Test value is less than the Critical Value (α = 5%). In this study, the critical value used is 5% because at the 1% point, the data is non-stationary for mudharabah contracts. For murabahah contracts, the ADF Test value is less than the Critical Value (α = 5%), namely -8.141472 < -3.984991, thus the data can be considered stationary. Furthermore, for mudharabah contracts, the ADF Test value is -5.151556 < -3.984991, the Critical Value (α = 5%). Furthermore, in the musyarakah contract, the ADF Test value is less than the Critical Values (α=5%), which is -18.34905 < -3.984991, thus it can be considered stationary. Stationary data occurs when data consistently tends to move towards the average. The Risk Adjusted Return on Capital (RAROC) calculation at Bank Muamalat Indonesia for the period 2019 to 2023 is calculated by dividing the Risk Adjusted Return (RAR) variable by the Risk Capital (RC) variable. The results of the calculation of the RAR, RC, and RAROC values for financing at Bank Muamalat Indonesia for the period 2019 to 2023 are as follows.

The Risk Adjusted Return (RAR) value of Bank Muamalat Indonesia for the period 2019 to 2023 is positive, meaning that the Net Profit value is greater than the Expected Loss (EL) value. The Risk Adjusted Return (RAR) value in 2019 was Rp. 24,703,235,000.00 then became Rp13,381,758,000.00 in 2020. The Risk Adjusted Return (RAR) value in 2021 was Rp. 12,119,722,000.00 then became Rp. 51,345,150,000.00 in 2022. The Risk Adjusted Return (RAR) value in 2023 was Rp13,436,257,000.00. The highest Risk Adjusted Return (RAR) value for the 5-year research period was in 2022 and the lowest was in 2021. The average Risk Adjusted Return (RAR) value for 2019 to 2023 was Rp. 22,977,224,000.00.

DISCUSSION

Discussion on the calculation of Value at Risk and Risk Adjusted Return on Capital financing at Bank Muamalat Indonesia for the period 2019 to 2023 for mudharabah, musyarakah and murabahah financing at Bank Muamalat Indonesia.

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Table 3: Value at Risk (VaR) Calculation Results

Information	Murabahah	Mudharabah	Musyarakah
Standard Deviation	0,01113458	0,03682141	0,02568683
Ao / Eksposur (in millions of rupiah)	9.453.270	610.135	12.492.853
VaR Mean (in millions of rupiah)	175.792	36.633	517.547
VaR Zero (in millions of rupiah)	-1.236.975	-13.599	-1.593.236
VaR Mean (%)	1,84%	6,08%	4,24%
VaR Zero (%)	-13,25%	-2,16%	-12,70%
Average VaR (%)	-5,71%	1,96%	-4,23%

Source: Bank Muamalat Indonesia Annual Report for the 2019-2023 Period (data processed using Ms. Excel)

The Value at Risk (VaR) calculation results show that mudharabah financing has a standard deviation of 0.036. Musharakah financing has a standard deviation of 0.025. Murabahah financing has a standard deviation of 0.011. The largest standard deviation is found in mudharabah financing, and the smallest is found in murabahah financing. The average exposure value for mudharabah financing is IDR 610,135,000,000.00. The average exposure value for musharakah financing is IDR 12,492,853,000,000.00. The average exposure value for murabahah financing is IDR 9,453,270,900,000.00. The largest average exposure value is found in musharakah financing, and the smallest is found in murabahah financing.

The average Mean VaR value as a percentage for mudharabah financing contracts is 6.08%. Furthermore, for musyarakah financing contracts, it is 4.24% and for murabahah financing contracts, it is 1.84%. The Zero VaR for modharabah contracts is 2.16%. Furthermore, the Zero VaR percentage value for musyarakah financing contracts is 12.7% and for murabahah financing contracts is 13.25%. The greatest potential risk is in mudharabah financing, with the highest Mean VaR and Zero VaR values. Furthermore, the lowest potential risk is in murabahah financing, with the smallest Mean VaR and Zero VaR values.

From the Value at Risk (VaR) calculation above, it can be seen that financing with mudharabah contracts has the highest risk, while financing with musyarakah contracts has the lowest risk in this study. This figure is inconsistent with the equivalent rate or

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return at Bank Muamalat Indonesia, which indicates that financing under the musyarakah contract has the highest return. The return for financing under the murabahah contract is still higher than that for financing under the mudharabah contract. This is because the composition of financing under the mudharabah contract is only 3% of the total financing at Bank Muamalat, while the composition of murabahah contracts is 40% of the total financing at Bank Muamalat.

After calculating the Risk Adjusted Return and Risk Capital values, the RAROC value will be obtained by dividing RAR and RC. The following is a discussion of the results of the RAROC calculation of Bank Muamalat Indonesia for the period 2019 to 2023.

Table 4: Risk Adjusted Return on Capital (RAROC) Data Processing Results for Bank Muamalat Indonesia for the 2019-2023 Period

(in thousands of rupiah)					
Periode	**2019**	**2020**	**2021**	**2022**	**2023**
EL (1)	1.462.765	1.636.242	393.278	655.850	669.743
Net Profit (2)	26.166.000	15.018.000	12.513.000	52.001.000	14.106.000
WL (3)	2.045.182	2.421.060	1.058.659	1.014.882	1.012.565
RAR (4) = (2-1)	24.703.235	13.381.758	12.119.722	51.345.150	13.436.257
RC (5) = (3-1)	582.417	784.818	665.381	359.032	342.822
RAROC (6)=(4/5)	42,42	17,05	18,21	143,01	39,19

Source: Bank Muamalat Indonesia Annual Report for the 2019-2023 Period (data processed using Ms. Excel)

Based on Table 4.22, the Risk Adjusted Return (RAR) is positive, indicating that the Expected Loss (EL) is less than the Net Profit. This indicates no risk or loss, as the total profit is greater than the Expected Loss (EL) from Bank Muamalat Indonesia's financing from 2019 to 2023. Furthermore, Risk Capital (RC) indicates the amount of capital required to cover costs if a risk materializes. A positive Risk Capital (RC) value indicates that Bank Muamalat Indonesia has capital reserves capable of covering losses should such a risk occur.

The positive RAROC value during the study period indicates no potential loss, as the Risk Adjusted Return (RAR) is positive and the average profit, or Net Profit, is greater

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than the average loss, or Expected Loss (EL). This is positive for Bank Muamalat Indonesia. If losses are not realized or only profit is realized, Bank Muamalat does not need to cover them with capital. Bank Muamalat Indonesia's RAROC fluctuated, decreasing between 2020 and 2023. However, it increased in 2021 and then decreased again in 2022. The RAROC values were 42.42 in 2019; 17.05 in 2020; 18.21 in 2021; 143.01 in 2022; and 39.91 in 2023.

A higher or positive RAROC value indicates a bank's good performance, and vice versa. At Muamalat Indonesia, the RAROC value was positive throughout the study period. This indicates that Bank Muamalat Indonesia has good performance due to its potential for profitability. The RAROC value can also be used to assess a bank's resilience if estimated risks are realized. In other words, the higher the RAROC value, the safer it is for depositors to place their funds with that bank. A positive RAROC value at Bank Muamalat Indonesia during the study period indicates that Bank Muamalat has guaranteed profitability, allowing depositors to trust their funds.

The High Risk, High Return principle states that when an investment's return increases, its risk also increases. Bank Muamalat Indonesia's risk and return potential fluctuated during the five-year study period. Although total financing disbursed from 2019 to 2023 increased, the risk and return levels tended to fluctuate annually. The risk and return at Bank Muamalat Indonesia from 2019 to 2023, measured using the VaR and RAROC methods, are illustrated in the graph below.

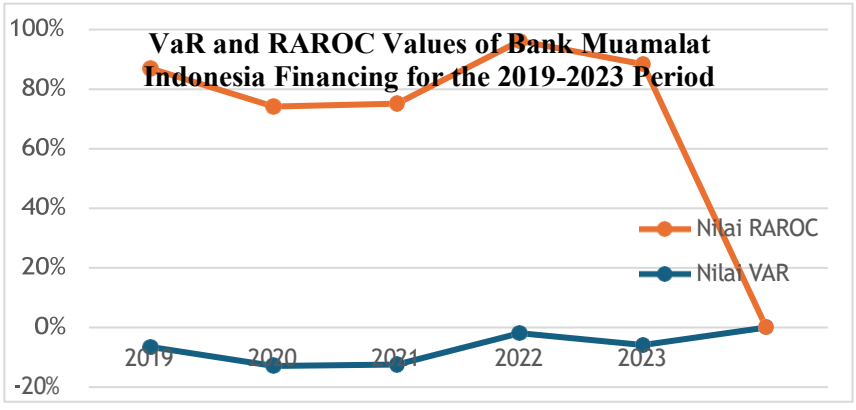

Figure 3. Graph of Bank Muamalat Indonesia's VaR and RAROC Values for the 2019-2023 Period

Source: Data processed using Excel (2025)

The graph above shows that increases and decreases in risk and return, as measured by the VaR and RAROC methods, move in the same direction. Each increase

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in VaR was not always accompanied by an increase in RAROC from 2019 to 2022. However, in 2023, a decrease in VaR was not accompanied by a decrease in RAROC, but was accompanied by an increase in RAROC. From 2019 to 2020, both VaR and RAROC values decreased. Then, from 2020 to 2021 and from 2021 to 2022, both VaR and RAROC values increased. However, from 2022 to 2023, both VaR and RAROC values decreased. A positive VaR value indicates potential risk, while a negative VaR value indicates potential return. Conversely, a negative RAROC value indicates risk, while a positive RAROC value indicates potential return. The VaR and RAROC calculations indicate that Bank Muamalat Indonesia is able to generate returns on its financing each year.

The findings regarding the importance of VaR and RAROC for measuring risk and return at Bank Muamalat Indonesia (BMI) highlight several key points in the global context of Islamic banking. First, they confirm that VaR is an effective method for measuring the potential risk of financing products in Islamic banks, particularly those based on contracts such as mudharabah and murabahah. This supports the relevance of the VaR and RAROC approach at BMI for assessing the risk and return of their financing, which is dominated by low-risk but stable murabahah products. Second, global literature also emphasizes that the dominant characteristics of murabahah financing in Islamic banks create a low-risk profile, making the high-risk-high-return principle less appropriate. Studies from various Islamic banks indicate that sale-based financing such as murabahah produces more manageable risk and tends to be more stable in return, in contrast to profit-sharing financing, which is riskier but potentially higher in return. Thus, BMI's findings, which rely on murabahah, align with global observations that risk and return in Islamic banks are not always directly proportional.

CONCLUSIONS

This study critically challenges the classic assumption of a high-risk-high-return relationship common in conventional financial theory by highlighting the unique context of Islamic banking, particularly at Bank Muamalat Indonesia (BMI). The findings demonstrate that the structure of Islamic banking products, particularly the dominance of low-risk but stable-return murabahah financing, challenges the premise that high risk must always be accompanied by high returns.

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The financing risk level at Bank Muamalat Indonesia is measured using the Value at Risk (VaR) method and the Risk Adjusted Return on Capital (RAROC) method. The following conclusions can be drawn from this study:

1. The Value at Risk (VaR) calculation shows that financing under the mudharabah contract has the highest risk, while financing under the murabahah contract has the lowest risk. This is inconsistent with the Equivalent Rate or return value at Bank Muamalat Indonesia, which indicates that financing under the musyarakah contract has the highest return. Therefore, it can be concluded that high-risk financing does not have the potential for high returns.
2. The RAROC measurement result is positive because the average profit, or Net Profit, is greater than the average loss, or Expected Loss (EL). This result indicates that in 2022, Bank Muamalat Indonesia had the highest potential return or the lowest potential risk. In 2020, Bank Muamalat Indonesia had the lowest potential return or the highest potential risk.
3. The high-risk, high-return principle in measuring potential risk and return does not apply to Bank Muamalat Indonesia, whether using the VaR or RAROC methods, particularly for mudharabah, musyarakah, and murabahah financing products. In fact, the musyarakah financing product with the highest return (measured by the equivalent interest rate) does not have the highest risk. Meanwhile, mudharabah financing, which carries the highest risk, has the lowest return. This is due to the higher proportion of musyarakah financing compared to other financing products, averaging IDR 12,492,853,000,000.00 during the 2019-2023 period.

The high-risk, high-return principle is inconsistent with the potential risk and return as measured by the RAROC method for Bank Umum Muamalat Indonesia. The RAROC value indicating the highest return occurred in 2022, while the equivalent value indicating the lowest return (highest risk) occurred in 2019. Return risk in Islamic banks is more related to fluctuations in customer returns and their impact on third-party funding behavior, rather than solely the risk of extreme financial loss as often assumed in conventional banking. Therefore, this study emphasizes the need for a risk management and performance evaluation framework tailored to the unique characteristics of Islamic banks, rather than simply adopting conventional risk-return theory without adaptation. This thinking opens up space for the development of risk management theories and

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applications that are more contextual and relevant to Islamic banking operations, while emphasizing the importance of risk measurement approaches such as VaR and RAROC that can capture the specific risk and return dimensions in this sector.

The limitations are as follows: This study only used the Value at Risk (VaR) and Risk Adjusted Return on Capital (RAROC) methods to measure risk and return applied to Bank Muamalat Indonesia. The second study was conducted at Bank Muamalat Indonesia during the 2019-2023 period, focusing only on three financing products: murabahah, mudharabah, and musyarakah.

Based on the research results and conclusions obtained, this study is expected to be beneficial for Bank Muamalat Indonesia. The following recommendations are provided.

1. Based on VaR calculations, it is important to maintain financing risk management to anticipate potential risks in financing and operational activities. This is particularly true for mudharabah contracts, which still have a positive VaR value, indicating potential risk.
2. Bank Muamalat Indonesia needs to further monitor and improve the management of its productive assets by adopting a risk-based approach to productive asset utilization.

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