

STRATEGI DIVERSIFIKASI PORTOFOLIO: ANALISIS DAMPAK RISIKO DAN KEUNTUNGAN PADA BANK KONVENSIONAL DAN SYARIAH MILIK NEGARA DI INDONESIA

(PORTFOLIO DIVERSIFICATION STRATEGIES: ANALYZING RISK AND RETURN IMPACTS IN INDONESIAN STATE-OWNED CONVENTIONAL AND ISLAMIC BANKS)

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Abstrak

Penelitian ini meneliti hubungan antara diversifikasi portofolio kredit dengan risiko dan imbal hasil bank milik negara (Bank BUMN) dari tahun 2019 hingga 2023. Menggunakan analisis regresi linier berganda, penelitian ini mengevaluasi dampak Indeks Herfindahl Hirschman (HHI) terhadap risiko kredit atau pembiayaan (NPL dan NPF) dan imbal hasil bank (ROA, ROE) pada bank BUMN yang terdaftar di Bursa Efek Indonesia. Variabel kontrolnya mencakup ukuran bank, rasio kredit atau pembiayaan terhadap simpanan (LDR dan FDR), dan rasio ekuitas terhadap total aset (ETA). Hasilnya menunjukkan bahwa diversifikasi portofolio kredit mengurangi risiko kredit di bank BUMN, menunjukkan bahwa menyebarkan eksposur kredit di berbagai sektor dapat mengurangi risiko. Namun, diversifikasi tidak secara signifikan mempengaruhi imbal hasil bank (ROA, ROE). Variabel kontrol seperti ukuran bank, LDR dan FDR, dan ETA tidak menunjukkan dampak signifikan terhadap risiko kredit, ROA, atau ROE. Studi ini memberikan bukti empiris tentang efektivitas diversifikasi portofolio pembiayaan dalam mengelola risiko kredit di bank milik negara, dengan mempertimbangkan prinsip-prinsip perbankan syariah. Meskipun diversifikasi dapat mengurangi risiko kredit, dampaknya terhadap profitabilitas memerlukan pertimbangan yang cermat. Bank BUMN harus menerapkan kerangka penilaian risiko yang kuat dan pengawasan strategis untuk memaksimalkan manfaat diversifikasi sambil menjaga stabilitas keuangan dan mematuhi praktik keuangan yang etis dan sesuai syariah.

Kata Kunci: Portofolio pembiayaan; Diversifikasi; Risiko dan imbal hasil; Bank milik negara.

Abstract

This research examines the relationship between credit portfolio diversification and the risk and return of state-owned banks (Bank BUMN) from 2019 to 2023. Using multiple linear regression analysis, it evaluates the impact of the Herfindahl Hirschman Index (HHI) on credit or financing risk (NPL and NPF) and bank returns (ROA, ROE) among state-owned banks listed on the Indonesia Stock Exchange. Control variables include bank size, loan or financing to deposit ratio (LDR and FDR), and equity to total asset ratio (ETA). The results show that credit portfolio diversification reduces credit risk in BUMN banks, suggesting that spreading credit exposures across sectors can mitigate risk. However, diversification does not significantly affect bank returns (ROA, ROE). Control variables such as bank size, LDR and FDR, and ETA show no significant impact on credit risk, ROA, or ROE. This study provides empirical evidence on the effectiveness of financing portfolio diversification in managing credit risk within state-owned banks, considering Islamic banking principles. While diversification can mitigate credit risk, its impact on profitability requires careful consideration. BUMN banks should implement robust risk assessment frameworks and strategic oversight to maximize diversification benefits while maintaining financial stability and adhering to ethical and Sharia-compliant financial practices.

Keywords: Financing portfolio; Diversification; Risk and return; State-owned banks.

Introduction

In their role as financial intermediaries, banks are engaged in the mobilization of funds from the public and their subsequent disbursement in the form of loans or financings. Banks are capable of distributing these financing across various economic sectors, thereby creating a diversified credit portfolio. This financing

distribution is inherently linked to financing risk and the returns generated from these financing. Financing risk poses a significant challenge for banks, as it can lead to financial instability and jeopardize operational continuity (Zuhroh, 2022). Financing risk refers to the potential for financial losses arising from a borrower's inability to meet their debt obligations, including both principal and interest

payments, as per financing contracts. This scenario not only risks the loss of funds but also hampers the bank's ability to achieve optimal profitability. To mitigate this risk, banks must diversify their financing portfolios across multiple economic sectors (Setiawan et al., 2023). For example, if a bank has a diversified credit portfolio in the agriculture, manufacturing, and services sectors, in the event of a crisis in the agriculture sector due to a drop in commodity prices, the impact will not be as severe as if the bank had only distributed its credit portfolio in the agriculture sector alone. The bank can still offset the losses with the other sectors such as manufacturing and services. Consistent with the findings of Prastiwi and Anik (2020), sectoral diversification emerges as an effective strategy for banks, as it helps in reducing the incidence of non-performing loans. Shim (2019) further corroborates that banks which diversify their credit portfolios are more efficient in mitigating fragility risks compared to those concentrating their financing in a single area.

State-owned banks or also called as BUMN banks in Indonesia refers to banks which are partially or wholly government-owned (Amaluis, 2023), require stringent oversight of their operations. Any financial losses incurred by these banks can adversely impact the broader Indonesian economy. As Amaluis (2023) notesd, the public tends to place greater trust in state-owned banks for their deposits, due to guarantees provided by the government. Hence, these banks have substantial opportunity to leverage deposited funds for other business activities. The level of credit portfolio diversification in state-owned banks can be assessed using the Herfindahl-Hirschman Index (HHI). According to Siregar et al. (2022), an HHI value approaching 0 indicates a highly diversified credit portfolio, whereas a value nearing 1 signifies a highly concentrated portfolio. A higher HHI denotes lower diversification levels and vice versa. The progression of credit portfolio diversification in the state-owned banks, as indicated by HHI values, is illustrated in Figure 1.

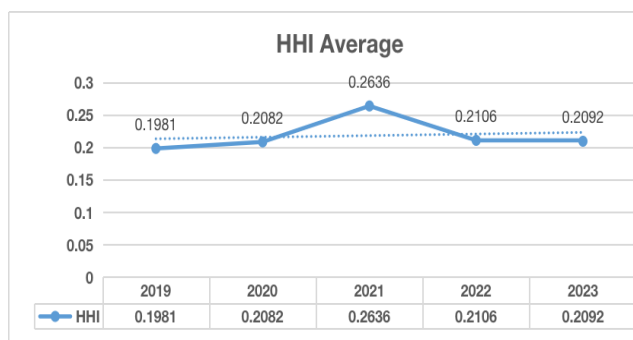


Figure 1. HHI Average of State-Owned Banks in Indonesia
Source: Author's elaboration (2024).

The analysis of state-owned banks (Bank BUMN) from 2019 to 2023 reveals an average Herfindahl-Hirschman Index (HHI) value of 0.22. This figure is obtained by averaging the HHI values calculated annually and then taking the mean of these yearly figures. An HHI value approaching 0 is indicative of a highly diversified credit portfolio. Consequently, a value of 0.22 suggests that the credit portfolios of Bank BUMN are well-diversified, implying that their loan distribution is spread across multiple economic sectors rather than being concentrated in a limited number of sectors.

The topic of credit portfolio diversification has been explored in various contexts and regions. For instance, Setiawan et al. (2023) conducted a study in Indonesia, Adzobu et al. (2017) in West Africa, Shim (2019) in the United States, and Chen et al. (2023) in China. Additional studies by Huynh Japan (2020) in Vietnam, Berger et al. (2023) in China, Hayden (2023) in Germany, and Acharya et al. (2023) in Italy have also contributed to this body of research. Despite these studies, research on credit portfolio diversification within the Indonesian context remains relatively limited, and the results of existing studies often exhibit inconsistencies.

This research aims to expand on previous studies by examining how credit portfolio diversification influences the risk and return of state-owned banks (Bank BUMN) over the period from 2019 to 2023. By utilizing a different sample and time frame, this study seeks to provide new insights and contribute to the understanding of this comprehensive relationship. The samples in this study include both conventional and Islamic banks in Indonesia, offering a comprehensive view of the banking sector's diversification strategies. Islamic banks, which operate under Shariah principles, prohibiting interest (riba), and emphasizing profit-sharing arrangements, present unique diversification dynamics compared to conventional banks. The research also incorporates several control variables, including bank size, loan-to-deposit ratio (LDR), and equity-to-total-asset ratio (ETA), to ensure a comprehensive and nuanced analysis. Bank size is an important control variable because larger banks may have more resources and capabilities to diversify their financing portfolios and manage risks effectively (Setiawan et al., 2023). The loan-to-deposit ratio (LDR) (for conventional banks) and financing-to-deposit ratio (FDR) (for Islamic banks) are another critical variables, as it reflects a bank's liquidity and its ability to distribute financing from its deposits (Rahmawati and Laila, 2020). A higher LDR and FDR may indicate a higher risk-taking behavior, which can impact the bank's risk and return profile. Finally, the equity-to-total-asset ratio (ETA) is used to measure a bank's capitalization and financial stability. Banks with

higher equity ratios are generally better positioned to absorb losses and manage risks (Priono and Pangestuti, 2019).

By considering these control variables, the study aims to exclude the impact of credit portfolio diversification on the risk and return of state-owned banks (Bank BUMN) and provide a clearer understanding of how diversification strategies can influence bank performance in the Indonesian's financial market context. The importance of this study is underscored by the significant role that state-owned banks (Bank BUMN) play in the Indonesian economy. Given their substantial market share and influence, the stability and profitability of these banks are critical for the overall economic health of the country (Indonesian Financial Authority, 2023). By analyzing the diversification strategies of both conventional and Islamic state-owned banks, this study seeks to provide comprehensive insights that can inform more effective banking policies and practices. The findings of this research have the potential to offer valuable insights for policymakers, bank managers, and other stakeholders who are interested in enhancing the stability and profitability of banks through effective diversification strategies.

Literature review

Theoretical background

Portfolio credit or portfolio financing refers to a collection of loans with varying levels of risk and return potential (Setiawan et al., 2023). Banks strategically construct their financing portfolios to achieve maximum profitability while managing specific risk thresholds. Diversification, in this context, involves spreading these financing portfolios across various economic sectors to minimize financing risk (Setiawan et al., 2023). Diversification principles originate from portfolio theory initially developed by Harry Markowitz (Setiawan et al., 2023). Markowitz's theory advocates for not concentrating all investments in one asset class, famously summarized as "don't put all your eggs in one basket." This principle underscores the importance of spreading investments to reduce the impact of potential losses. Applied to financing portfolios, diversification across economic sectors helps mitigate financing risk by ensuring that if one sector underperforms, losses can be offset by other sectors, thus limiting overall financial exposure.

However, the strategy of diversifying financing portfolios comes with costs, primarily associated with monitoring and managing loans across diverse sectors (Huynh Japan, 2020). These monitoring costs can reduce banking profitability, as highlighted by Hartono (Setiawan et al., 2023). Nevertheless, the relationship between risk and return remains pivotal; typically, higher risks entail the

potential for higher returns, reflecting a positive correlation between risk-taking and profitability in banking operations. This study aims to explore how financing portfolio diversification impacts the risk and return profiles of Indonesian state-owned banks (Bank BUMN) from 2019 to 2023. By grounding the study in portfolio theory, which advocates for risk management through diversification, the objective is to provide empirical insights into how these strategies influence bank performance in the Indonesian context. Understanding these dynamics is critical for enhancing financial stability and profitability within the banking sector, particularly for state-owned institutions that play a significant role in the country's economic landscape.

Financing Risk

According to Siregar et al., (2022), financing risk pertains to the inability of a company, institution, or individual to meet their financial obligations in a timely manner, whether at maturity or post-maturity, as per agreed terms and regulations. This risk is commonly assessed through Non-Performing Loans (NPL) and Non-Performing Financing (NPF) for conventional banks and Islamic banks, respectively. The NPL and NPF represent loans with deteriorated quality, doubtful repayment capabilities, or defaults (Khamisah et al., 2020). The NPL and NPF ratios compare problematic loans and financing to the total amount of loans disbursed, serving as key indicators of financing risk and the performance or function of banks. Bank Indonesia's Regulation No. 06/10/PBI/2004 on the Assessment System for Commercial Bank Health specifies that the acceptable threshold for NPL and NPF is 5 percent (Indonesia, 2004). This regulatory standard aims to uphold the stability and robustness of the banking sector by limiting the proportion of non-performing loans and financing relative to total loans disbursed.

Bank Return

Bank return refers to the rate of return on the credit portfolio held by a bank (Siregar et al., 2022). According to Adzobu et al. (2017), return on assets (ROA) and return on equity (ROE) are commonly used metrics to measure bank return. ROA, as defined by Pratiwi and Anik (2020), represents a bank's ability to generate profit from its total assets. ROE, on the other hand, reflects the return on its equity (Waskito and Faizah, 2021). A higher ROA indicates that the bank is effectively utilizing its total assets to generate profits, while a higher ROE signifies greater net income generated from the utilization of its total equity. These metrics are crucial in evaluating the financial performance and efficiency of banks. ROA and ROE provide insights into how effectively a bank utilizes its resources to generate profits, thereby indicating its overall financial health and profitability.

Bank Size

Bank size, typically measured by total assets, is a crucial metric in assessing a bank's scale within the financial sector (Millenio, 2022). According to Bhattarai (2018), larger banks generally exhibit lower credit risks. This indicates that larger banks have greater resources and expertise to conduct more thorough risk analysis of borrowers, thereby enhancing their effectiveness in credit assessment and monitoring. Consequently, larger bank size correlates with lower credit risk. Moreover, banks with substantial total assets are positioned to achieve higher returns. In line with Adzobu et al. (2017), larger banks tend to yield higher returns on assets (ROA) and equity (ROE). This is attributed to their ability to attract funds from a broader customer base, thereby reducing the costs associated with fund collections. Additionally, larger banks have broader access to capital markets, enabling them to attract customers more efficiently. Therefore, greater bank size correlates with higher bank returns. The relationship between bank size and financial performance underscores the advantages of scale in banking operations, including enhanced risk management capabilities and greater efficiency in fund mobilization and customer acquisition. These factors contribute to the overall stability and profitability of larger banks in the financial landscape.

Loan-to-Deposit Ratio (LDR) and Financing-to-Deposit Ratio (FDR)

LDR and FDR are metrics used to gauge the extent to which banks utilize customer deposits to extend loans to other clients. A higher LDR and FDR indicate a greater amount of loans disbursed, thereby increasing credit risk (Astrini et al., 2018). The volume of loans disbursed contributes to higher bank returns due to reduced idle funds. Higher LDR and FDR values correlate with higher Return on Assets (ROA) (Setyarini, 2020), and also increase Return on Equity (ROE) (Asnel et al., 2020). Therefore, elevated LDR values correspond to increased credit risk and bank returns. The relationship between LDR, FDR, and financial performance underscores the balance between leveraging customers' deposits for lending activities and managing associated credit risks. These ratios reflect the operational efficiency of banks in utilizing available funds to maximize returns while navigating the inherent risks associated with higher loan disbursement levels.

Equity to Total Asset (ETA)

ETA reflects the effectiveness of a bank in utilizing its equity to finance its assets. A high ETA indicates that the bank relies more on its own capital rather than debt to fund its assets. According to Tabak et al., (2011) a higher ETA is associated with increased credit risk, as it suggests a

greater willingness to engage in riskier lending activities. On the other hand, as noted by Mercieca et al., (2006), banks with a higher ETA have the potential to achieve higher returns. This indicates that such banks possess the capacity and confidence to pursue more lucrative investment opportunities. Therefore, the magnitude of ETA can influence both the risk and return profiles of a bank. The relationship between ETA, risk management, and financial performance underscores the strategic importance of capitalization levels in banking operations. Higher ETA values may enhance profitability but also elevate credit risk, necessitating robust risk management frameworks to maintain stability and optimize returns.

Hypotheses Development

Portfolio Financing Diversification and Financing Risk

The theory put forth by Markowitz (Setiawan et al., 2023) emphasizes the principle of "don't put all your eggs in one basket." When applied to the allocation of bank financing portfolios, this principle suggests that banks should diversify their financing across multiple sectors rather than concentrating it in a single sector. This strategy helps mitigate the risk of substantial losses or potential bankruptcy if a particular sector experiences defaults or fails to repay borrowed funds. Effective diversification across sectors allows banks to minimize the risks they face, contingent upon maintaining robust monitoring practices. Aligned with the findings of Setiawan et al. (2023), Shim (2019), Adzobu et al. (2017), and Chen et al. (Setiawan et al., 2023), which highlight the risk-reducing benefits of financing portfolio diversification, it is hypothesized that high diversification (low Hirschman Herfindahl Index, HHI) leads to lower financing risk. Therefore, the hypothesis can be formulated as:

H1: Financing portfolio diversification negatively affects the financing risk of state-owned banks (Bank BUMN).

Diversification of Financing Portfolios and Bank Returns

Banks that implement a strategy of diversifying their financing portfolios often see a reduction in their overall return on assets. This is primarily due to the additional costs involved in diversification. According to Setiawan et al. (2023), the expenses associated with diversifying financing portfolios can be considerable. Research by Chen et al., (2014) and Adzobu et al. (2017) supports this view, suggesting that diversifying financing portfolios increases costs, which ultimately diminishes banking profitability. Therefore, higher portfolio diversification, characterized by a lower Hirschman Herfindahl Index (HHI), tends to lower returns. This outcome arises from the increased monitoring costs incurred by banks to oversee diverse sectors within their portfolios. Based on this

theoretical foundation, the following hypothesis can be formulated:

H2: Financing portfolio diversification negatively affects the return of state-owned banks (Bank BUMN).

Method

Sample and Data Collection

This study focuses on both state-owned Islamic and conventional banks listed on the Indonesia Stock Exchange (BEI) over a five-year period from 2019 to 2023. It employs a quantitative research approach to explore the relationships between variables, with a particular emphasis on hypothesis testing. The population for this research includes all state-owned Islamic and conventional banks in Indonesia that are listed on the BEI. The total population consists of 5 banks, including 4 conventional banks (BNI, BRI, MANDIRI, BTN) and 1 Islamic bank (BSI). Using census sampling, every member of this population is considered a research sample (Fitria & Ariva, 2019). The sample analyzed for this study is listed in Table 1.

Table 1. Research Sample

No.	Company Name	Stock Code
1.	PT. Bank Negara Indonesia Tbk	BBNI
2.	PT. Bank Rakyat Indonesia Tbk	BBRI
3.	PT. Bank Mandiri Tbk	BMRI
4.	PT. Bank Tabungan Negara Tbk	BBTN
5.	PT Bank Syariah Indonesia Tbk	BRIS

Source: IDX (2024)

Data collection relies on secondary sources. A thorough literature review involves studying and synthesizing theories from relevant scholarly literature (Adlini et al., 2022). Documentation techniques are employed to gather data from the annual reports of each bank, accessible through the official BEI website. This comprehensive research design aims to provide insights into the dynamics affecting both Islamic and conventional state-owned banks in Indonesia over the specified period. By leveraging existing data sources and employing rigorous quantitative methods, the study seeks to contribute valuable knowledge to the understanding of these financial institutions' performance and risk management strategies.

Variables Identification

Independent Variable

The independent variable in this study is credit portfolio diversification, projected through Herfindahl-Hirschman Index (HHI). Herfindahl-Hirschman Index (HHI) serves as an indicator of market concentration, ranging from 0 to 1 (Millenio, 2022). According to Widyatini (2015), a lower HHI value indicates greater credit portfolio diversification, while a higher value suggests concentration in specific sectors. The calculation for HHI is expressed as:

$$HHI = \sum_{i=1}^n \left(\frac{X_i}{Q} \right)^2$$

Where HHI represents the Herfindahl-Hirschman Index; n denotes the number of groups measured; i represents the number of industry sectors; X_i denotes the total credit amount per sector; and Q represents the total financing amount. This index provides a quantitative measure of how widely or narrowly credit is distributed across different sectors, thereby quantifying the level of portfolio diversification within a bank's lending activities. This refined explanation integrates the concept of the Herfindahl-Hirschman Index (HHI) as a crucial metric for assessing the concentration or diversification of credit portfolios in banking research.

Dependent Variables

According to Ningsih (2021), dependent variables are influenced by independent variables (X). In this study, the dependent variables include credit risk projected through Non-Performing Loan (NPL) for conventional banks, Non-Performing Financing (NPF) for Islamic banks, and bank returns projected using Return on Assets (ROA) and Return on Equity (ROE). These variables are essential for assessing the financial health and performance of banks, providing insights into their risk management practices and profitability measures.

Non-Performing Loan (NPL) and Non-Performing Financing (NPF)

In conventional banking, the Non-Performing Loan (NPL) ratio is a crucial measure for evaluating credit risk, indicating the percentage of loans that have become problematic or defaulted compared to the total loan portfolio (Khamisah et al., 2020). The formula for calculating NPL is:

$$NPL = \frac{\text{Non Performing Loans}}{\text{Total Loans}} \times 100\%$$

NPL provides a vital insight into the asset quality and the effectiveness of credit risk management strategies employed by conventional banks. In Islamic banking, credit risk assessment centers around Non-Performing Financing (NPF), analogous to NPL but specifically relating to financing assets that are considered problematic or non-performing (Rahmawati and Laila, 2020). This metric evaluates the quality of financing portfolios in Islamic banks, taking into account factors such as liquidity constraints and repayment issues.

$$NPF = \frac{\text{Non Performing Financing}}{\text{Total Financing}} \times 100\%$$

Return On Asset (ROA)

Return on Assets (ROA) is a ratio that provides insight into the efficiency of a company in managing its operational activities (Prastiwi and Anik, 2020). According to Wibowo (2021), ROA is calculated using the following formula:

$$ROA = \frac{\text{Net Profit}}{\text{Total Asset}} \times 100\%$$

Return On Equity (ROE)

According to Waskito & Faizah (2021), Return on Equity (ROE) is a ratio used to measure how effectively each unit of invested capital in total equity generates net profit. As

per Kasmir (2012), the calculation formula for ROE is as follows:

$$\text{ROE} = \frac{\text{Net Profit}}{\text{Total Equity}} \times 100\%$$

Control Variables

Control variables, also known as covariates, are variables that control or mitigate the influence of independent variables on dependent variables (Ulfa, 2019). These variables are managed or kept constant to ensure that the impact of independent variables on the dependent variable is not influenced by unexamined external factors. In this study, the control variables include Bank Size, Loan to Deposit Ratio (LDR), and Equity to Total Assets (ETA). Bank Size refers to the total assets held by a bank, indicating its scale of operations and resource base (Millenio, 2022). A larger bank size may imply greater financial stability and risk management capabilities due to its ability to diversify operations and attract diverse funding sources (Bhattarai, 2018). Loan to Deposit Ratio (LDR) and Financing to Deposit Ratio (FDR) measures the extent to which a bank uses customer deposits to extend financing to other customers. A higher LDR and FDR indicates a greater amount of loans extended relative to deposits, potentially increasing credit risk but also maximizing profitability through efficient asset utilization (Astrini et al., 2018).

Equity to Total Assets (ETA) reflects the proportion of a bank's assets financed by its shareholders' equity rather than debt. A higher ETA suggests greater reliance on internal funding, which can enhance financial stability and resilience against market fluctuations (Tabak et al., 2023). These control variables are crucial in ensuring that the observed relationships between the independent variables (such as portfolio diversification measured by Herfindahl Hirschman Index) and the dependent variables (such as credit risk and bank returns) are accurately assessed and interpreted within the context of Indonesian state-owned banks.

Analysis Techniques

The research employs multiple linear regression analysis to examine the impact of portfolio credit diversification on key banking metrics: Non-Performing Loans (NPL), Non-Performing Financing (NPF), Return on Assets (ROA), and Return on Equity (ROE). Two distinct models were tested, which is the first assessing the relationship between credit portfolio diversification (measured by the Herfindahl Hirschman Index, HHI) and credit risk (proxied by NPL); the second exploring the effect on bank returns (proxied by ROA and ROE). Hypothesis testing proceeded through partial hypothesis tests (t-tests) for each independent variable against the dependent variables. Decisions were based on significance levels (< 0.05 indicating acceptance and > 0.05 rejection), guided by established criteria and standards (Millenio, 2022). Additionally, coefficient of determination (R^2) analysis quantified the percentage of variance in dependent variables explained by independent variables. If the R^2 value is close to 1, it means that the independent variable explains the dependent variable more strongly; if the R^2

value is close to 0, it means that the independent variable explains the dependent variable less strongly (Millenio, 2022). Prior to hypothesis testing, classical assumption tests following Millenio (2022) were conducted to ensure robustness consisting of autocorrelation, heteroskedasticity, multicollinearity, and normality tests.

Findings

Results

Table 2 illustrates descriptive statistics encompassing minimum, maximum, mean, and standard deviation. In this investigation, the variables of interest are NPL (for conventional banks) and NPF (for Islamic banks), representing bank credit risk, and ROA and ROE, signifying bank returns. As per Table 2, the average Non-Performing Loans (NPL) for state-owned banks listed on the Indonesia Stock Exchange from 2019 to 2023 was 0.008021. The maximum recorded value was 0.296, indicating challenges in credit risk management among banks with higher NPL, potentially due to concentrated credit exposure, inadequate debtor monitoring, or external borrower-related factors. Conversely, minimal NPL values suggest either a low incidence of problematic loans or effective risk mitigation strategies.

State-owned banks during the period 2019-2023 exhibited an average ROA of 0.020804, with a maximum of 0.0403 and a minimum of 0.0013. A higher maximum ROA implies efficient asset management contributing to profitability, whereas a lower minimum ROA suggests less effective asset utilization for profit generation. Similarly, the average ROE during 2019-2023 was 0.145980, with a maximum of 0.2731 and a minimum of 0.0100. Higher ROE values denote effective equity deployment for profit generation, while lower ROE values indicate less efficient utilization of equity capital. The average Herfindahl Hirschman Index (HHI), utilized to gauge credit portfolio diversification, stood at 0.217932, with a maximum of 0.5335 and a minimum of 0.1082. A higher maximum HHI suggests lower portfolio diversification, potentially indicating concentrated credit exposures, whereas a lower minimum HHI indicates a well-diversified credit portfolio spanning multiple economic sectors.

Table 2. Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation
NPL (NPF)	0.0012	0.0296	0.008020	0.0071768
ROA	0.0013	0.0403	0.020804	0.0111620
ROE	0.0100	0.2731	0.145980	0.0588551
HHI	0.1082	0.5335	0.217932	0.0889724
SIZE	18.04	21.50	20.3640	0.96137
LDR (FDR)	0.7339	0.9536	0.800156	0.0623851
ETA	0.553	0.8633	0.175204	0.2075725

Source: Author's elaboration.

Moreover, the average bank size during 2019-2023 was 20.3640, with a maximum of 21.50 and a minimum of 18.04. A higher maximum size reflects larger total assets, potentially yielding higher returns if managed effectively, while a lower minimum size suggests smaller total assets. Lastly, the average LDR during 2019-2023 was 0.800156, with a maximum of 0.9536 and a minimum of 0.7339. A higher maximum LDR indicates significant lending relative to deposits, potentially impacting liquidity, whereas a lower minimum LDR suggests underutilization of available funds for lending. In summary, these descriptive statistics from Table 2 provide a comprehensive overview of critical financial metrics for state-owned banks, shedding light on their performance and risk profiles during the specified period. Such insights are pivotal for understanding credit risk dynamics, profitability, and portfolio management within banking institutions.

Table 3. Results of Regression Analysis on NPL (NPF)

Variables	Standardized Coefficients (Beta)	T-value	Sig.
HHI	0.538	2.338	0.030
SIZE	-0.336	-1.599	0.125
LDR (FDR)	-0.422	-1.876	0.075
ETA	0.000	0.000	1.000

R Square – 0.529

Adjusted R Square – 0.435

Source: Author's elaboration.

The findings from Table 3 indicate a positive relationship between HHI and NPL, suggesting that portfolio credit diversification has a negative impact on credit risk. This implies that higher HHI values (indicating lower portfolio credit diversification) correspond to increased credit risk for banks. Additionally, lower portfolio diversification intensifies the risk exposure faced by banks. The significance level for the dependent variable NPL was found to be below 0.05, thereby rejecting the null hypothesis (H_0 1). This indicates that, financing portfolio diversification negatively affects the return of state-owned banks. By diversifying portfolio, it could help to minimize the risk, and thus, enhance return from portfolio diversification.

Table 4. Results of Regression Analysis on ROA

Variables	Standardized Coefficients (Beta)	T-value	Sig.
HHI	-0.213	-0.865	0.397
SIZE	0.569	2.532	0.020
LDR (FDR)	0.081	0.336	0.741
ETA	-0.023	-0.120	0.906

R Square – 0.463

Adjusted R Square – 0.355

Source: Author's elaboration.

Table 5. Results of Regression Analysis on ROE

Variables	Standardized Coefficients (Beta)	T-value	Sig.
HHI	0.006	0.022	0.982
SIZE	0.478	1.835	0.081
LDR (FDR)	0.182	0.651	0.522
ETA	-0.056	-0.256	0.800
R Square – 0.278			
Adjusted R Square – 0.134			

Source: Author's elaboration.

Portfolio credit diversification has proven to be an effective strategy for state-owned banks during the period 2019-2023 in mitigating credit risk. This aligns with the fundamental principle of diversification in portfolio theory, often encapsulated in the proverb "don't put all your eggs in one basket." Applied to credit portfolio diversification, this principle underscores the importance of avoiding over-reliance on specific credit sectors. By spreading credit portfolios across various sectors, state-owned banks can mitigate the impact of defaults or problems in one sector by relying on performance in other sectors. In the Adjusted R Square, the coefficient of determination (R^2) is reported as 0.435. This indicates that 43.5% of the variation in NPL can be explained by the independent variables studied, while the remaining 56.5% is attributed to other variables not included in this research. These findings are consistent with prior studies by Prastiwi & Anik (2020), Chet et al (Setiawan, 2023), Simpasa and Pla (Prastiwi & Anik, 2020), Ahyar (2021), Shim (2019), Moudud-Ul-Huq (2019), and Acharya et al (Setiawan et al, 2023).

Meanwhile, the results in Table 4 indicate that HHI does not influence ROA, suggesting that portfolio credit diversification does not affect Return on Assets. The significance value for the dependent variable ROA is above 0.05. The coefficient of determination is reported as 0.355, indicating that 35.5% of the variation in ROA can be explained by the independent variables studied, while the remaining 64.5% is attributed to other variables not included in this study. Similarly, Table 5 illustrates that HHI does not affect Return on Equity (ROE), indicating that portfolio credit diversification does not influence returns generated from total equity utilization. The significance level for ROE is also above 0.05. The coefficient of determination is 0.134, suggesting that 13.4% of the variation in ROE can be explained by the independent variables used in this study, while the remaining 86.6% is explained by other variables not included in the analysis.

The lack of significant influence of portfolio credit diversification on ROA and ROE is attributed to the fact that the significance values for these dependent variables, which project bank returns, exceed 0.05. Therefore, we failed to reject the null hypothesis (H_0 2), indicating that portfolio credit diversification does not affect a bank's return. Portfolio credit diversification does not significantly enhance or diminish ROA and ROE for state-owned banks, as the dispersion of credit portfolios does not uniformly yield similar advantages across every sector.

Each sector possesses distinct characteristics and varying levels of risk, which can influence the overall performance of the credit portfolio (Aiyubbi et al., 2022). According to Markowitz's portfolio theory, which advises against putting all eggs in one basket, diversifying credit portfolios involves not only spreading eggs (credit portfolios) across various baskets (economic sectors) but also selecting the right baskets (economic sectors) for each type of egg (credit portfolio). As highlighted by Ahyar (2021), banks must exercise selectivity in choosing economically profitable sectors to achieve desired profits. This perspective is reinforced by Archarya et al. (Raei et al., 2016) and Raei et al. (2016).

Discussion

The research findings underscore that while bank size does not significantly influence credit risk, this conclusion warrants critical scrutiny. Despite robust oversight mechanisms by large banks, external economic and market conditions can still jeopardize debtor repayment capacities. Consequently, size alone may not suffice to mitigate all credit risks effectively (Setiawan et al., 2023). Moreover, the observed influence of size on return on assets (ROA) but not on return on equity (ROE) suggests potential inefficiencies in capital utilization strategies within larger banks (Paramitha & Prasetyia, 2023). Regarding LDR and FDR, the study confirms that this indicator does not directly impact credit risk, contrary to initial expectations. This finding challenges the conventional belief that higher LDR or FDR correlates with increased credit risk, highlighting the effectiveness of rigorous monitoring practices in mitigating loan default risks (Rasyiddin & Hirawati, 2022). Furthermore, the lack of influence of LDR or FDR on bank return underscores the nuanced interplay between loan quality and profitability, emphasizing the importance of quality over quantity in lending practices (Widyastuti & Aini, 2021; Henry & Ruslim, 2022).

The analysis of ETA reveals that while ETA does not significantly affect credit risk, it underscores the cautious lending behavior associated with higher equity levels in banks. However, ETA negligible impact on bank return raises questions about the optimal allocation and management of capital resources within banking institutions (Setiawan et al., 2023). In conclusion, this critical examination of size, LDR or FDR, and ETA in relation to bank risk and return highlights the complexities and interdependencies within banking operations. While certain metrics may not directly influence risk or return as traditionally expected, their implications on banking strategies and operational efficiencies remain crucial. Future research could delve deeper into the qualitative aspects of risk management and capital allocation strategies to enhance the resilience and profitability of banking institutions in dynamic financial landscapes. These insights contribute to ongoing discussions in banking research, informed by empirical evidence and scholarly discourse (Aiyubbi et al., 2022; Archarya et al., 2016; Raei et al., 2016).

From an Islamic banking perspective, the results highlight a critical consideration. Islamic banks, which operate under Sharia principles prohibiting excessive risk and uncertainty (gharar), often emphasize risk-sharing and ethical investment. The finding of this study reveals that credit portfolio diversification reduces credit risk, which aligns with Islamic banking's risk management principles (Akram and Hushmat, 2024). However, the lack of impact on profitability measures such as ROA and ROE underscores the complexity of achieving financial returns while adhering to ethical guidelines. Islamic banks must strive to balance their diversification strategies with careful selection of sectors that comply with Sharia principles and provide stable returns. One example is Islamic real estate, investment in the real estate sector, including the development of residential housing, apartments, and commercial properties that comply with Islamic principles, such as being free from interest (riba) and having clear ownership rights.

Conclusion and Recommendation

The study reveals that credit portfolio diversification has a negative impact on credit risk within BUMN banks. This finding challenges the conventional wisdom, suggesting that spreading credit portfolios across various sectors reduces the overall risk exposure associated with loan defaults (Prastiwi & Anik, 2020; Simpasa & Pla, 2020). However, contrary to expectations, variables such as Size, LDR or FDR, and Equity to ETA do not significantly influence credit risk. Despite the large size of some banks and their supposedly stringent monitoring mechanisms, external economic shocks or sector-specific vulnerabilities may still pose substantial risks that cannot be entirely mitigated through portfolio diversification alone (Setiawan et al., 2023). Moreover, the analysis indicates that credit portfolio diversification does not significantly affect the return on assets (ROA) and return on equity (ROE) of BUMN banks. Similarly, the control variables, LDR and ETA also show no significant impact on ROA and ROE. This suggests that while diversification may mitigate risk, it does not necessarily enhance profitability in terms of asset utilization and equity returns (Ahyar, 2021; Shim, 2019; Moudud-UI-Huq, 2019).

Future researchers are encouraged to expand sample sizes and include additional variables such as Operational Costs to Operating Income (BOPO), which could provide further insights into their impact on bank risk and returns. Understanding these dynamics more comprehensively could contribute to refining risk management strategies and optimizing operational efficiencies within banking institutions. From a regulatory perspective, caution is advised in implementing regulatory mechanisms that promote credit portfolio diversification. While diversification can potentially reduce risk, the effectiveness of such strategies depends heavily on robust risk

assessment frameworks and vigilant oversight. Regulatory bodies should consider the nuanced impacts of diversification on both risk and profitability to strike a balance that ensures stability without compromising financial performance. For BUMN banks, strategic decision-making regarding diversification into new sectors should be approached with careful consideration. This includes rigorous monitoring and evaluation of sector specific risks to safeguard profitability. By maintaining a balanced approach between risk management and strategic expansion, BUMN banks can sustainably navigate market uncertainties and achieve long-term financial health (Archarya et al., 2016; Raci et al., 2016). For Islamic banks, this means adhering to Sharia principles while ensuring diverse, ethical, and stable investments.

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