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THE EFFECT OF INCOME DIVERSIFICATION STRATEGY ON CREDIT RISK AND MARKET RISK IN COMMERCIAL BANKS IN INDONESIA DURING THE COVID-19 PANDEMIC

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Abstract

The phenomenon of economic instability due to the COVID-19 pandemic has encouraged banks to improve income diversification strategies in order to reduce risk exposure and maintain sustainable financial performance. This study aims to analyze the effect of income diversification on credit risk and market risk with the role of control variables Size, Tangible Asset, Return on Asset and Liquidity. The study was conducted at Conventional Commercial Banks in Indonesia during the period 2018-2023. This research method uses a quantitative approach with secondary data. The population in this study is all Conventional Commercial Banks in Indonesia as many as 105 banks, then the sample determination uses purposive sampling technique and produces 101 banks as samples. The observation period for six years produced a total of 606 observation data. The analysis tool uses SPSS 26.0 software through multiple regression tests. The first regression results show that income diversification has a significant negative effect on credit risk (sig. 0.000; t-stat -3.170). Meanwhile, the size control variable does not affect credit risk (sig. 0.353; t-stat 0.930), Tangible does not affect credit risk (sig. 0.261; t-stat -1.125). ROA has a positive effect on credit risk (sig. 0.000; t-stat 6.399). Liquidity has a positive effect on credit risk (sig. 0.000; t-stat 6.355). The R^2 value of 0.204 indicates that 20.4% of the variation in credit risk can be explained by income diversification, and the control variables Size, Tangible Asset, Return on Asset and Liquidity. In the second regression, income diversification has a significant negative effect on market risk (sig. 0.049; t-stat -1.972). Meanwhile, the control variable size has a positive effect on market risk (sig. 0.002; t-stat 3.049), Tangible has no effect on market risk (sig. 0.493; t-stat -0.686). ROA has a negative effect on market risk (sig. 0.002; t-stat 3.184). Liquidity has a positive effect on market risk (sig. 0.000; t-stat 21.080). The R^2 value of 0.583 indicates that 58.3% of the variation in market risk can be explained by income diversification, and the control variables Size, Tangible Asset, Return on Asset and Liquidity.

Keywords: ***income diversification, Size, Tangible Asset, Return on Asset and Liquidity and Conventional Commercial Banks***

INTRODUCTION

The COVID-19 pandemic, which first emerged in Wuhan, China, in December 2019, was declared a global pandemic by the WHO in March 2020. The pandemic has had a tremendous impact on global health, humanity, economy, and financial stability. With more than 85 million cases of infection and 1.8 million deaths by the end of 2020, the pandemic has created a significant health crisis and humanitarian disaster in many countries.

To control the spread of the virus, mobility and economic activity restrictions were imposed, which caused a global economic contraction, especially in the first half of 2020. Despite improvements in the second half of 2020, the global economic recovery was still hampered by further waves of the pandemic, including the rapidly spreading Delta variant in 2021. Mobility restrictions to contain the spread of this variant have had an impact on weakening various economic indicators, such as the consumer confidence index, retail sales, and the Purchasing Managers' Index (PMI).

The global economic recovery that has been ongoing since the third quarter of 2021 shows the inequality between developed and developing countries. This inequality is caused by differences in vaccination rates and the ability of policy stimulus in each country. The pandemic also provides important lessons in the international trade system, monetary system, and world financial system, which are of concern to strengthen global economic resilience in the future.

The COVID-19 pandemic has highlighted the importance of revenue diversification strategies for financial institutions, especially banks, in dealing with emerging risks, such as credit risk and market risk. This is an important background for examining the impact of revenue diversification strategies on both types of risks in commercial banks in Indonesia during the pandemic.

In Indonesia, The government, Bank Indonesia (BI) and the Financial Services Authority (OJK) are working together to provide stimulus and relaxation to maintain the economy and the stability of the financial system. The government has issued various fiscal policies and social assistance, even providing interest subsidies and additional guarantees for working capital credit for MSMEs (Micro, Small and Medium Enterprises). The BI has also issued a liquidity relaxation policy so that economic liquidity is maintained, thus providing comfort for the financial industry and the community. OJK has issued various policy stimuli both in the Capital Market to maintain the performance and stability of the capital market, as well as in banking through credit restructuring affected by COVID-19 to provide time for business actors to organize their financial conditions. The Covid-19 pandemic has provided valuable lessons to improve and strengthen ourselves in facing future challenges, including the banking sector in Indonesia which has a very vital role in supporting Indonesia's economic growth.

Amidst the global and domestic economic conditions that are still affected by the COVID-19 pandemic, banking credit risk in general during the pandemic is still under control, as reflected in the condition of bank NPLs which are quite well maintained at 3% at the end of 2021 with credit growth of 5.2%. However, it is necessary to pay attention to the increase in credit risk considering economic activity that has not recovered and the threat of new variants of COVID-19 and the global crisis related to the Russia-Ukraine war.

In responding to the phenomenon of the threat of new variants of COVID-19 and the global crisis, PUJK is competing to turn its business towards product diversification. The same thing is also done by Banks in Indonesia, where they issue new products that can facilitate consumers and formulate various strategies in order to survive and grow during the COVID-19 Pandemic, although we all know that the many products issued will certainly be directly proportional to the risks that will arise later. Therefore, it is necessary to conduct a study related to the diversification of income applied by Banks in Indonesia against credit risk and market risk that will arise later in line with the products that will be issued by banks during the COVID-19 Pandemic.

The banking sector plays an important role in supporting the stability of the financial system and economic growth of a country. Banks function as financial intermediaries that connect parties with surplus funds with parties in need of funds through fundraising and credit distribution activities. Therefore, the financial health of banks is one of the important indicators in assessing overall economic stability (Imbierowicz & Rauch, 2014).

Banking business activities are also inseparable from risks, especially credit risk and market risk. Credit risk reflects the possibility of customer failure to fulfill payment obligations, while market risk arises from fluctuations in the market value of bank assets or liabilities due to changes in interest rates, exchange rates, or security prices (Meslier, Tacneng, & Tarazi, 2020). In an uncertain economic situation, such as during the COVID-19 pandemic, the potential for an increase in both types of risks becomes greater, and has a direct impact on the stability and profitability of the bank.

Bitar et al. (2018) stated that income diversification is very important, especially during times of crisis such as a pandemic or global financial crisis, because banks cannot rely solely on income from credit interest which has decreased drastically due to decreasing demand and increasing risk of default. According to Stiroh (2004), income diversification is an effort by banks to expand their sources of income beyond traditional interest income by increasing income from fee-based activities, such as banking services and investments. This diversification aims to reduce dependence on interest income which is more volatile because it is influenced by the economic cycle and credit risk.

Revenue diversification is increasingly crucial in the face of today's economic dynamics and global uncertainty. The COVID-19 pandemic has become a significant turning point in the way various business sectors conduct their business activities. It is undeniable that the coronavirus has changed the way almost all industries work, including the financial and banking sectors. This crisis has forced companies, including banks, to re-evaluate their traditional business models and adapt to new strategies to maintain profitability and business sustainability. The CKPN ratio of general banks in 2019 before the pandemic emerged was around 3.14%, as shown in the following graph.

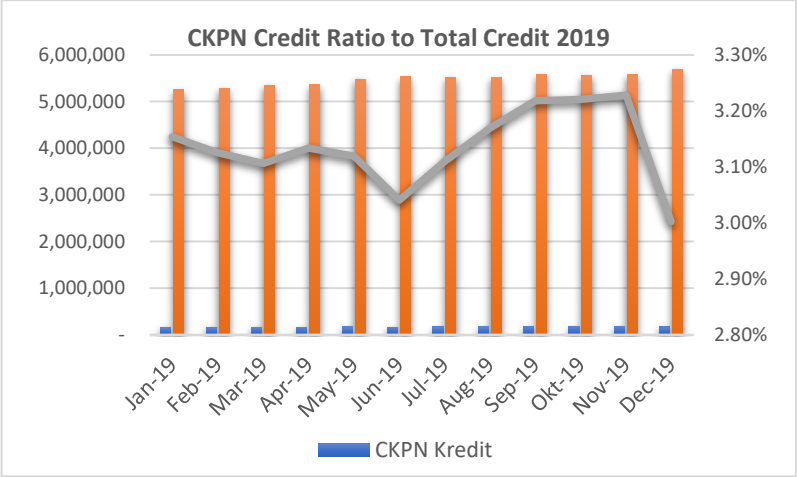


Figure 1. CKPN Credit Ratio to Total Credit in 2019

The graphic image 1. above illustrates the ratio of CKPN (Provision for Impairment Losses) Credit to Total Credit in 2019, before the pandemic. On the Y-axis, the percentage of the CKPN ratio is displayed, while the X-axis shows the months from January to December 2019. The line representing CKPN shows the fluctuation of the ratio throughout the year, while the total credit line reflects the total amount of credit disbursed by the bank. The average ratio of CKPN to total credit is around 3.14%. From this graph, it can be seen that the CKPN ratio varies, which may be influenced by economic conditions and policies implemented by the bank.

Meanwhile, the ratio of CKPN credit to total credit increased during the Covid-19 pandemic. The increase mainly started since March 2020 and was relatively stable in the range of 6% since May 2021 to December 2021.

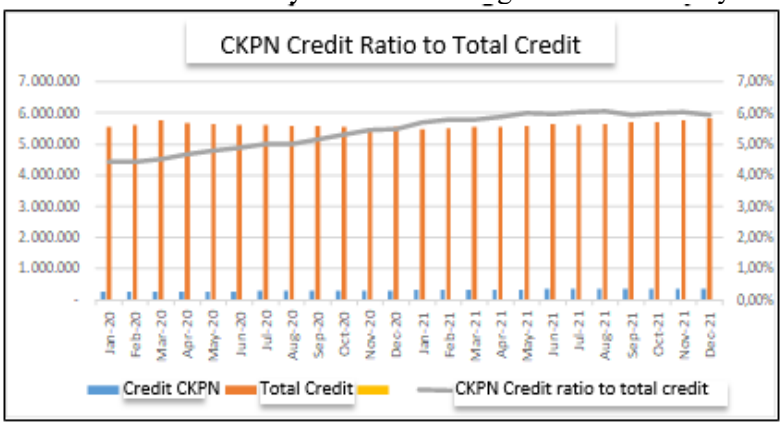


Figure 2. Credit CKPN Ratio to Total Credit in 2020 and 2021

Graph 2. above shows the ratio of CKPN (Allowance for Impairment Losses) Credit to Total Credit during the COVID-19 pandemic, especially from March 2020 to December 2021. From the graph, it can be seen that the CKPN ratio has increased significantly since March 2020, with a relatively stable figure in the range of 6% since May 2021 to the end of 2021. The CKPN line shows an increasing trend, reflecting the bank's response to higher credit risk due to the pandemic. While the total credit line shows a different trend, providing context for changes in the CKPN ratio. This graph reflects the impact of the pandemic on the bank's credit policy and risk management.The increase in CKPN also reflects the risk mitigation strategy implemented by the banking industry, namely by increasing reserves in order to maintain financial stability and protect profitability in the long term. Although this step reduces short-term profits, the policy shows a high level of caution from banking risk management.

The COVID-19 pandemic that hit throughout 2020 has put great pressure on the banking sector, especially conventional commercial banks in Indonesia. The Financial Services Authority (OJK) noted that banking profits experienced a significant decline ranging from 30% to 40%, depending on the size of the financial institution. State-owned banks experienced the deepest profit contraction of up to minus 50.07%, along with the high proportion of credit restructuring of 30.63%. Overall, the bank's net profit growth contracted by -33.08%. This was caused by several main factors such as lower interest rates, lower credit demand, and lower Net Interest Margin (NIM) which led to lower Return on Assets (ROA).

Banks in the BUKU 1 and BUKU 4 classifications also experienced the heaviest pressure, with profit contractions of -56.5% and -37.14%, respectively. On the other hand, the total restructured credit reached IDR 971 trillion, reflecting the high level of disruption to the ability of debtors to meet their obligations. The following presents the phenomenon of problems in the decline in the performance of conventional commercial banks in Indonesia due to Covid-19.

Table 1. Decline in Performance of Conventional Commercial Banks

Performance Indicators	Before the Pandemic	During the Pandemic (2020)	Decrease	Information
National Banking Profit	100% (baseline)	±60%–70% of normal profit	Down 30%-40%	General impact of the pandemic according to OJK
State-Owned Bank Profit	100% (baseline)	49.93% of normal profit	Down 50.07%	Related to high credit restructuring (30.63%)
Profit of Bank BUKU 1	100% (baseline)	43.5% of normal profit	Down 56.5%	Deepest decline among BOOK classes
Profit of BUKU 4 Bank	100% (baseline)	62.86% of normal profit	Down 37.14%	Significant impact on banks with large assets
National Bank Net Profit Growth	-	-33.08% (contraction)	Contraction 33.08%	Down due to interest rates and credit demand
Net Interest Margin (NIM)	Normal	Down	Decrease	Regarding low interest rates and loan demand
Return on Assets (ROA)	Normal	Down	Decrease	Asset efficiency impacted by pandemic
Restructured Credit	-	Rp 971 trillion	-	18% of total credit; 7.6 million debtors affected

Source: Republika.co.id.

This condition shows that the resilience of the banking sector to the global crisis still faces serious challenges, especially when major economic shocks such as the pandemic occur. This makes it urgent for banks to strengthen risk management, operational efficiency, and long-term adaptive strategies. Based on fphenomenon of declining performance of conventional commercial banksshows the existence of a gap phenomenon that is observed to indicate sOverall, the bank's net profit growth decreased by -33.08%. This was caused by several main factors such as lower interest rates, lower credit demand, and lower Net Interest Margin (NIM) which led to lower Return on Assets (ROA).

This research is also to fill ***research gap*** in literaturethat diversification and risk in the banking sector. Phe influence of income diversification strategies on credit risk and market risk in banks has been widely carried out, but the results still show inconsistencies or contradictions, especially when applied to a crisis context such as the COVID-19 pandemic. For example, research by Nguyen et al. (2021) shows that income diversification has a significant negative effect on credit risk, meaning that diversification can reduce the level of credit risk in banks, especially in emerging markets. However, this result differs from the findings of Elsas et al. (2020) which stated that the effect of diversification on credit risk was insignificant. This shows that diversification does not always automatically improve the quality of credit risk. In addition, DeYoung and Torna (2019) found that non-interest income as part of diversification actually increases market risk during the crisis period, which shows the negative side of uncontrolled diversification. In contrast, Meslier et al. (2020) proved that diversification can reduce market risk in emerging markets. These conflicting findings indicate contextual differences and inconsistencies in research results, which are an important basis for compiling this research.

Based on several previous studies pThe influence of income diversification strategies on credit risk and market risk in banks has been widely carried out. However, ***novelty*** from this research by referring to existing literature, This study lies in an attempt to integrate the diverse findings on the impact of diversification on bank performance and risk with a more comprehensive analytical approach, and consider contextual factors that may influence the relationship. By referring to the existing literature, this study aims to explore the dynamics between income diversification and bank risk in more depth, and to offer a new model that can explain how diversification strategies can be optimized to improve bank performance without significantly increasing risk. This study aims to analyze the Influence of Revenue Diversification Strategy on Credit Risk and Market Risk in Commercial Banks in Indonesia during the COVID-19 Pandemic., namely the period from 2019 to 2023.

FORMULATION OF THE PROBLEM

The COVID-19 pandemic has caused significant pressure on the financial performance of conventional commercial banks in Indonesia. The Financial Services Authority (OJK) noted that national banking profits have decreased between 30% and 40%, with state-owned banks recording a profit contraction of up to 50.07%. This decline was triggered by high credit restructuring, declining interest rates, credit demand and Return on Assets (ROA). In this context, the income diversification strategy is one of the potential steps that banks can take to maintain stability and reduce risk, both credit risk and market risk.

However, based on the latest literature review, there is still a research gap, the results of previous studies show inconsistencies regarding the effect of income diversification on credit risk and market risk; there are not many studies that examine this effect in the context of banks in Indonesia during the crisis, especially the COVID-19 pandemic; and the limitations of studies in including control variables such as bank size, tangible assets, ROA, and liquidity simultaneously.

Based on this background, the formulation of the problem in this study is as follows:

1. Does income diversification affect credit risk in conventional commercial banks in Indonesia?
2. Does income diversification affect market risk in conventional commercial banks in Indonesia?
3. Does bank size as a control variable affect credit risk?
4. Do tangible assets as control variables affect credit risk?
5. Does return on assets (ROA) as a control variable affect credit risk?
6. Does liquidity as a control variable affect credit risk?
7. Does bank size as a control variable affect market risk?
8. Do tangible assets as control variables affect market risk?
9. Does return on assets (ROA) as a control variable affect market risk?
10. Does liquidity as a control variable affect market risk?

LITERATURE REVIEW

Banking Diversification

Banking diversification is a strategy carried out by banks to expand sources of income and reduce dependence on traditional interest income. This is done by developing non-interest income activities, such as fee-based services, foreign exchange trading, and other financial services. This strategy is considered important in dealing with increasingly complex risk dynamics, especially in times of crisis or economic uncertainty. According to Stiroh (2004), diversification of banking income can help reduce bank-specific risks because income from various sources has a low correlation, so that overall it can stabilize the bank's financial performance. This opinion is reinforced by research by DeYoung and Torna (2013) who found that income diversification can increase the stability of income and bank profitability, especially during times of market volatility. Furthermore, Sanya and Wolfe (2011) explained that income diversification can be an important tool in managing credit risk and market risk. By expanding activities into non-traditional segments, banks can reduce exposure to credit risk arising from conventional loans. However, careless diversification can increase operational risk if the bank does not have adequate risk management capacity.

Credit Risk Analysis

The risk of a bank loan portfolio can be viewed from the following risks: credit risk, investment risk, liquidity risk, operating risk, and fraud risk. These risks are the six risks found by Vojta faced by commercial banks. In an extreme situation of combined bank failure, credit risk and fraud risk are fatal. Under normal circumstances, the most important thing in a loan portfolio is credit risk which is related to losses arising from poor bank loan portfolios. In "risk return" on debtors who have a weak financial position therefore have high credit risk should pay greater credit risk and vice versa for those who have a strong financial position. In order to provide a better meaning for the purpose of credit analysis, the verbal term "strong versus weak" regarding financial position and also the term "high versus low" for credit risk need to be "quantified". To achieve this goal, each element of the 5C is analyzed in terms of the potentials inherent in it that can be quantified (Tamon, et al., 2016).

Market Risk Analysis

Market conditions and situations with various stability and instability can influence the continuity and profit of the company. Market risk is a condition experienced by a company caused by changes in external market conditions and situations and company control (Fahmi, 2014:69). One measurement of market risk is the interest rate, which is measured by the difference between the funding interest rate and the lending interest rate or in absolute form is the difference between the total funding interest cost and the total loan interest cost where in banking terms it is called Net Interest Margin (NIM). The higher the NIM, the higher the ROA. NIM is measured by the comparison between net interest income and productive assets.

Relationship Between Research Variables

The Effect of Income Diversification on Credit Risk

The relationship between diversification and credit risk depends on the theoretical approach applied. The modern portfolio theory approach states that there is a negative relationship between diversification and credit risk. This is in accordance with the studies conducted by Mawar (1996) and Liang and Rhodes (1988) who found that diversification reduces bank risk. Other studies show that diversification improves the performance of low-risk banks (Acharya et al., 2006), reducing credit risk (Akhigbe and Whyte, 2003; Zamore et al., 2019).

The more diversified income means the bank reduces its credit expansion. With reduced credit expansion, credit risk decreases. Diversification of income means that the bank has more businesses that generate non-interest income. So that credit expansion decreases, credit risk decreases which is in line with the decrease in CKPN. Meanwhile, based on agency theory, it shows a negative relationship between diversification and credit risk. Several studies state that diversification increases credit risk so that there is a more positive relationship. For example, an increase in credit risk was found due to diversification (Gulamhussenet al., 2014), problematic loans were found (Winton, 1999), company complexity and difficulty in monitoring credit risk due to diversification (Winton, 1999; Cerasi and Daltung, 2000). The condition is caused by management not being focused on building the quality of credit exposure because they get other benefits from income diversification. Based on the above, the first hypothesis is as follows:

H1: Income Diversification Has a Negative Impact on Credit Risk

The Effect of Income Diversification on Market Risk

The more diversified income means that banks increase fee-based income, then banks will reduce investment in securities that are affected by interest rates. With reduced credit expansion, interest rate fluctuations are reduced so that market risk is also reduced. Diversified income means that banks are increasingly doing business that generates non-interest income. So that credit expansion decreases, credit risk decreases. In addition, income diversification also shows investment in non-traditional sources of income compared to sources such as loans or interest-bearing securities.

Thus, income diversification can encourage the level of investment in the securities they hold. However, this is not directly expected to be positive or negative because it will depend on the level of loans that are part of interest-bearing assets. In the context of Indonesian banking, research by Widyarti and Sari (2023) shows that income diversification has a positive and significant effect on bank risk, as measured by the Z-Score, in digital banks in Indonesia. Another study by Fadli (2020) found that income diversification can improve bank performance, but credit diversification actually increases risk and decreases bank performance.

A study by Adem (2022) shows that income diversification can improve bank stability in developing countries, but the results vary depending on the context and banking structure of each country. Meanwhile, a study by Li et al. (2021) during the COVID-19 pandemic found that non-interest income is positively related to bank performance and negatively related to risk, indicating a beneficial effect of diversification during the crisis. Based on these findings, the second hypothesis in this study is:

H2: Income diversification has a negative effect on Market Risk

Theoretical Framework

This study explores the impact of income diversification on credit risk as well as on the market risk that arises. By referring to the background and literature above, the theoretical framework can be described as in the following figure.

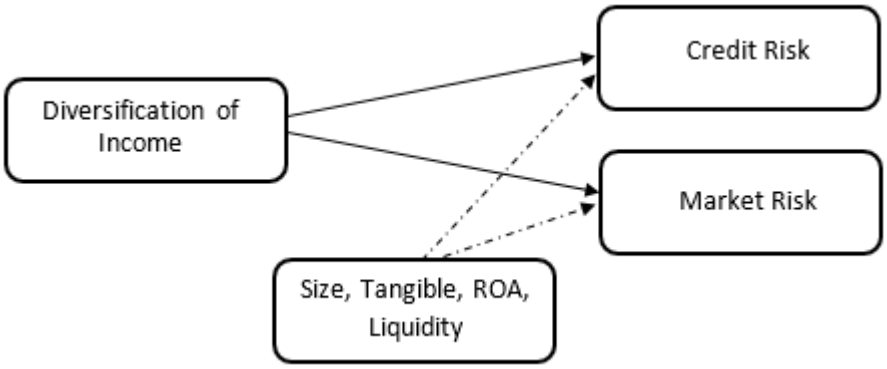


Figure 3. Framework of Thought

RESEARCH METHODS

Research Design

This research design is quantitative and aims to analyze how the influence of income diversification strategy on credit risk and market risk with control variables of Size, Tangible Asset, Return on Asset and Liquidity in banks in Indonesia during the Covid-19 pandemic.

Types and Sources of Research Data

This study uses Indonesian Banking Statistics data on State-Owned Commercial Banks, Regional Government Banks, National Private Banks, and Banks with branches located abroad. The financial report data in question uses a 6-year period (2018-2023), as well as other data sourced from research journals and the official OJK website.

Population and Sample

The population in this study is all Conventional Commercial Banks operating in Indonesia and have submitted complete annual financial reports to the Financial Services Authority (OJK) totaling 105 conventional commercial banks in Indonesia.The selection method used was purposive sampling, aThe sample criteria in this study are as follows:

1. Conventional commercial banks operating in Indonesia.
2. Conventional commercial banks that report complete and consistent annual financial reports during the period 2018 to 2023.
3. Conventional commercial banks that are supervised and report regularly to the Financial Services Authority.

Table 2. Conventional Bank Sample Criteria

Information	Amount
Commercial Banks with Conventional Business Activities in Indonesia	105
Conventional Commercial Banks that do not report complete financial reports for the period 2018-2023	(4)
Conventional Commercial Banks that report complete financial reports for six consecutive years in the period 2018-2023	101

Method of collecting data

This study uses secondary data from Indonesian Banking at Bank Umum Persero, Regional Government Banks, National Private Banks published on the OJK website. as well as other data sourced from research journals and the official OJK website.

Data Analysis Techniques

This study uses a quantitative data analysis approach, especially using quantitative data analysis methodology. This involves solving using multiple regression analysis there are two regressions, the first regression of income diversification with control variables on credit risk and the second regression on market risk.

RESEARCH RESULTS AND DISCUSSION

Research result

This study involved 101 Conventional Commercial Banks operating in Indonesia and had reported complete financial statements for six consecutive years, namely from 2018 to 2023. Of the total 105 registered Conventional Commercial Banks, 4 banks did not meet the criteria because they did not report complete financial statements during the period. Therefore, only 101 banks were sampled in this study. The data used in this study are secondary data sourced from the annual financial statements of each bank. With a time span of six years and a total of 101 banks, the total observation data used in the analysis amounted to 606 observations (101 banks × 6 years).

Descriptive Statistics of Research Variables

The initial number of observations was 606 data (101 × 6). However, based on the results of the classical assumption test, extreme data (outliers) were found in several variables that could affect the feasibility of the regression model. Therefore, outlier data that was identified as abnormal was carried out. After this process, the final number of observation data used in the research data was 400 data. Desk rips vari abel researcher This tian is presented as follows.

Table 3. Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Income Diversification	400	-89.79	62.52	-29,9342	35,16290
Credit Risk	400	,23	100.13	57,7833	23.14885
Market Risk	400	,15	15.52	6,3841	3.62643
SIZE	400	,23	6.63	3,2557	1,16051
Tangible Asset	400	,05	3.37	1,3029	,76391
Return on Asset	400	-1.22	3.44	1,1589	,80648
Liquidity	400	,01	21.88	8,1884	4.96865
Valid N (listwise)	400				

Source: SPSS data processing, 2025

a. Income Diversification
The average level of income diversification in conventional commercial banks in Indonesia during 2018–2023 was recorded at -29.93%, with a minimum value of -89.79% and a maximum of 62.52%, and a standard deviation of 35.16%. The negative average value indicates that the majority of banks in this sample are still highly dependent on their main income in the form of interest income from credit, compared to non-interest income such as commissions, fee-based income, and income from trading activities.

b. Credit Risk
The Credit Risk variable, which in this study is measured through the ratio of Allowance for Impairment Losses (CKPN) to total credit, shows an average value of 57.78%, with a minimum value of 0.23% and a maximum of 100.13%, and a standard deviation of 23.15%. This average value indicates that conventional commercial banks have generally set aside almost half of their total credit as reserves for potential losses, reflecting a level of prudence in credit risk management.

c. Market Risk
Market Risk measured based on the proportion of investment in government securities to total assets shows an average value of 6.38%, with a minimum value of 0.15%, a maximum of 15.52%, and a standard deviation of 3.63%. Investment in government securities (SBN) is considered a relatively safe instrument, and conventional banks often use it as a liquidity instrument as well as a source of stable interest income. The average of 6.38% shows that some banks allocate a small portion of their assets to manage market risk, as well as maintain a balance between profitability and asset security.

d. Company Size
Bank size (SIZE) in this study is measured by the natural logarithm of total assets. The average value of SIZE is 3.26, with a minimum value of 0.23 and a maximum of 6.63, and a standard deviation of 1.16. This large variation indicates that conventional commercial banks in Indonesia have a very diverse operational scale, ranging from

small-scale banks (for example ex-BPD or new banks) to large national and multinational banks. Bank size plays an important role in risk management and profitability.

e. Tangible Asset
Tangible Asset, which shows the proportion of fixed assets to total assets, has an average value of 1.30%, a minimum of 0.05%, a maximum of 3.37%, and a standard deviation of 0.76%. This low average value reflects the characteristics of the banking industry which is a financial services sector, where most assets consist of financial assets (credit, securities, cash), not physical assets. Conventional commercial banks tend to keep the proportion of fixed assets to a minimum to maintain operational flexibility and cost efficiency.

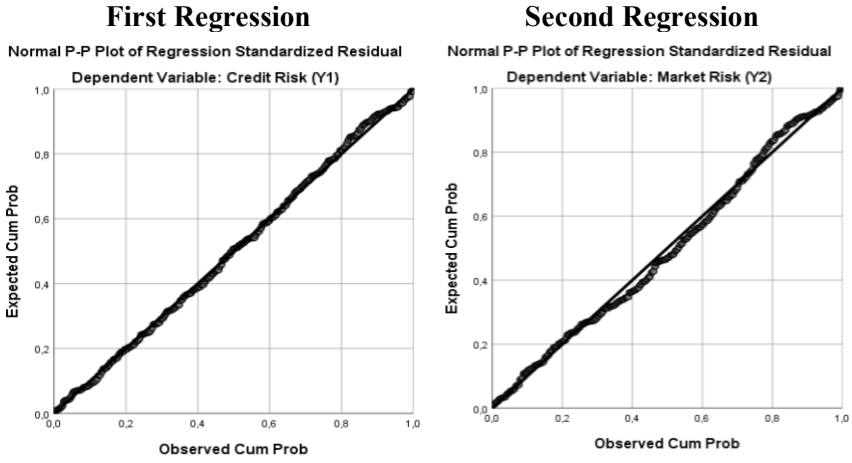
f. Return on Asset
ROA, which measures a bank's ability to generate profits from its total assets, shows an average of 1.15, a minimum value of -1.22, a maximum of 3.44, and a standard deviation of 0.81. The average value is quite moderate for the banking sector, which generally operates on thin but stable profit margins. A negative minimum value indicates that there are banks that experienced losses during the observation period, which could be caused by increased reserve costs, credit losses, or high operating costs. Meanwhile, banks with high ROA are likely to have healthy credit portfolios and are efficient in using assets. A fairly large standard deviation strengthens the indication that there is a disparity in efficiency between banks in generating profits. This can also be influenced by bank size, business strategy, and asset and liability management implemented by each institution.

g. Liquidity
The Liquidity variable, measured by the ratio of cash plus government securities to total assets, has an average of 8.18, with a minimum value of 0.01, a maximum of 21.88, and a standard deviation of 4.97. This ratio indicates how much liquid assets a bank has to meet short-term obligations. The average value of 8.18 is quite adequate and indicates that banks generally maintain a liquidity buffer to deal with potential sudden outflows of funds or market fluctuations.

Normality Test

In the normality test after the outliers were carried out, the first and second regression data are presented as follows.

Figure 4. PP Plot Normality Test



Source: processed data, 2025

The results of the normality test using the PP Plot method also show that the residual points are spread close to and follow the diagonal line consistently. This further strengthens that the residual distribution has approached the normal distribution after the outlier data is removed.

t-Test (First and Second Partial Regression Test)

The t-test is used to detect whether there is a partial influence between variables if the p-value (Siq.) is <0.10, meaning there is a significant influence. The results of the first and second regression t-tests are presented below.

Table 4First Regression t-Test

Variables	B	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	32,417	4,140		7,831	,000
Income Diversification	-,102	,032	-,154	-3,170	,002
Size Firm (K1)	,934	1,005	,047	,930	,353
Tangible Assets (K2)	-1,554	1,382	-,051	-1,125	,261
Return on Assets (K3)	8,473	1,324	,295	6,399	,000
Liquidity (K4)	1,403	,221	,301	6,355	,000

a. Dependent Variable: Credit Risk (Y1)

In table 4. above, the t-test will be explained below.

a. Income Diversification (MI) Variable
The results of the statistical test show that there is a significant negative effect of Income Diversification on the Credit Risk of conventional commercial banks in Indonesia in the financial report period from 2018 to 2023, seen from the significance value of 0.002 <0.10 with a t-count value of -3.170> -1.652. This shows that the higher the income diversification carried out by the bank, the lower the credit risk faced. The First Hypothesis is Accepted.

b. Control Variable Company Size (Size)
The results of statistical tests show that Size does not have a significant effect on the Credit Risk of conventional commercial banks in Indonesia, because the significance value is 0.353>0.10 and the t-count value is 0.930<1.652. This shows that company size does not have a significant effect on the level of credit risk borne by the bank.

c. Tangible Asset Control Variables
The results of statistical tests show that there is no significant influence of Tangible Assets on Credit Risk of conventional commercial banks in Indonesia, because the significance value is 0.261>0.10 with a t-count value of -1.125<-1.652. This indicates that the amount of tangible assets has not been able to explain the level of credit risk.

d. Control Variable Return on Assets
The results of statistical tests show that there is a significant positive influence of Return on Assets on Credit Risk of conventional commercial banks in Indonesia, indicated by a significance value of 0.000 < 0.10 with a t-value of 6.399 > 1.652. This means that the higher the bank's profitability, the higher the credit risk, possibly due to aggressive credit expansion.

e. Liquidity Control Variable
The results of statistical tests show that there is a significant positive effect of Liquidity on Credit Risk of conventional commercial banks in Indonesia, indicated by a significance value of 0.000 <0.10 and a t-count of 6.355>1.652. This means that the higher the liquidity of a bank, the greater the credit risk that may arise, possibly due to the distribution of liquid funds into risky credit activities.

Next, the second regression t-test will be explained with the dependent variable of market risk as follows.

Table 5.Second Equation t-Test

Variables	B	Std. Error	Standardized Coefficients	t	Sig.
(Constant)	1,408	,470		2,997	,003
Income Diversification	-,007	,004	-,069	-1,972	,049
Size Firm (K1)	,348	,114	,111	3,049	,002
Tangible Assets (K2)	-,108	,157	-,023	-,686	,493
Return on Assets (K3)	-,478	,150	-,106	-3,184	,002

Liquidity (K4)	,528	,025	,724	21,080	,000

b. Dependent Variable: Market Risk (Y2)

Source: processed data, 2025

a. Income Diversification Variable
The results of statistical tests show that there is a significant negative effect of Income Diversification on Market Risk of conventional commercial banks in Indonesia, indicated by a significance value of 0.049 < 0.10 and a t-value of -1.972 > -1.652. This means that the higher the income diversification carried out by the bank, the lower the market risk faced. Income diversification can help banks face market fluctuations more stably. The Second Hypothesis is accepted.

b. Control Variable Company Size (Size)
The results of statistical tests show that there is a significant positive effect of Size on Market Risk of conventional commercial banks in Indonesia, with a significance value of 0.002 <0.10 and a t-count of 3.049>1.652. This indicates that the larger the size of the bank, the higher the market risk borne, possibly due to greater exposure to market changes.

c. Tangible Asset Control Variables
The results of statistical tests show that there is no significant influence of Tangible Assets on Market Risk of conventional commercial banks in Indonesia, because the significance value is 0.493 > 0.10 with a t-count of -0.686 < 1.652. This shows that the amount of tangible assets has not been able to provide a significant contribution to changes in bank market risk.

d. Control Variable Return on Assets
The results of statistical tests show that there is a significant negative effect of Return on Assets on Market Risk of conventional commercial banks in Indonesia, indicated by a significance value of 0.002 < 0.10 and a t-count of -3.184 > -1.652. This means that the higher the bank's ability to generate profits from its assets, the lower the market risk faced. High profitability can strengthen the bank's position in facing market volatility.

e. Liquidity Control Variable
The results of statistical tests show that there is a significant positive effect of Liquidity on Market Risk of conventional commercial banks in Indonesia, indicated by a significance value of 0.000 <0.10 and a t-count of 21.080>1.652. This means that the higher the bank's liquidity, the higher the market risk, possibly because liquid funds are used in activities that are sensitive to market fluctuations.

DISCUSSION OF RESEARCH RESULTS

The Effect of Income Diversification on Credit Risk

The results of the study indicate that Income Diversification has a significant negative effect on Credit Risk in Conventional Commercial Banks in Indonesia during the financial reporting period of 2018 to 2023. This finding is based on the results of statistical tests showing a significance value of 0.002 <0.10 and a t-count value of -3.170> -1.652, which means that the higher the level of bank income diversification, the lower the credit risk they face. Theoretically, income diversification reduces banks' dependence on a single source of income, especially from credit distribution activities, so that it can stabilize cash flow and reduce exposure to credit risk. Banks that are able to obtain income from various sources, such as fee-based income, treasury, or non-traditional services, have higher financial flexibility in dealing with potential defaults from debtors.

The results of this study are in line with the study by Bitar, Hassan, and Walker (2018) which shows that income diversification helps banks reduce credit risk by improving income structure and allowing banks to better bear credit losses. A study by Abedifar, Molyneux, and Tarazi (2013) also confirms that banks with higher income diversification have lower credit risk, especially in an unstable economic environment.

The Impact of Income Diversification onMarket Risk

The results of the study found that the Income Diversification variable has a regression coefficient value of -0.007 with a significance value of 0.049 and a t-value of -1.972. Because this significance value is smaller than the 10% significance limit ($\alpha = 0.10$), it can be concluded that Income Diversification has a significant effect on Market Risk. Theoretically, these results support the view that income diversification is an effective risk mitigation strategy, especially in the banking sector which is vulnerable to market volatility. Income diversification refers to the bank's efforts to not only rely on interest income, but also develop non-interest income, such as income from fee-based

services, investments, treasury services, and digital banking services. The more diverse the bank's sources of income, the less dependence on single market conditions can be reduced, so that market risk can be suppressed.

This finding is in line with the results of the study by Vo et al. (2022) which states that income diversification can reduce market risk in the banking sector by creating a more stable income structure that is resistant to external fluctuations. Zhou and Zhu (2021) also found that banks that successfully balance interest and non-interest income tend to have lower market risk exposure, especially in emerging markets.

CONCLUSION

The results of the study indicate that income diversification plays an important role in risk mitigation. Income Diversification has a negative effect on Credit Risk and Market Risk, indicating that the more diverse the bank's income sources, the lower the credit risk and market risk faced. This diversification strategy has been proven to increase the bank's resilience to economic turmoil and market fluctuations.

Company size (Size) does not have a significant effect on credit risk, but has a positive effect on market risk. This means that banks with large assets tend to face higher market exposure due to the complexity of their investment portfolios. Meanwhile, Tangible Assets do not show a significant effect on both types of risk, indicating that the proportion of fixed assets in the bank structure is not enough to determine the magnitude of credit or market risk.

Return on Asset (ROA) has a positive effect on credit risk, but a negative effect on market risk. This reflects that high profitability can encourage risky credit aggressiveness, but on the other hand strengthens resilience to market volatility. Finally, Liquidity has a positive effect on both types of risk, indicating that high fund availability can encourage greater risk-taking behavior, both in credit provision and market activity.

RESEARCH LIMITATIONS

This study has several limitations that need to be considered for future research development. First, the use of secondary data from conventional commercial bank financial reports for the period 2018-2023 has not accommodated macroeconomic factors such as inflation, interest rates, exchange rates, and economic growth, which also affect banking risk. Second, the observation period mostly covers the COVID-19 pandemic as an abnormal period, which can cause distortion of results and limit long-term validity. Third, the scope of the object is only limited to conventional commercial banks, so the research results cannot be generalized to other financial institutions such as Islamic banks, BPRs, or non-bank institutions that have different risk characteristics. Fourth, risk measurement is only based on financial report ratios such as NPL, so it does not fully capture the complexity of risk. A more comprehensive approach with market indicators or stress testing needs to be considered in future research.

FUTURE RESEARCH AGENDA

Based on the results of this study, future research agendas can be directed to expand the scope of banking risk analysis. First, it is recommended that further research include external variables such as macroeconomic indicators (inflation, interest rates, exchange rates, and GDP growth), regulatory changes, and financial system stability. This is important to see how external factors strengthen or weaken the influence of internal variables on credit risk and market risk. Second, the observation period should be expanded to include a more complete economic cycle, including before, during, and after a crisis such as the COVID-19 pandemic. This approach can increase the validity of the results in the long term and describe the risk dynamics more representatively. Third, the research object can be developed not only limited to conventional commercial banks, but also include Islamic banks, regional development banks, or non-bank financial institutions, in order to obtain a more comprehensive understanding of risk patterns in various types of financial institutions.

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