Strategies to reduce credit risk and liquidity risk to increase bank profitability

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A B S T R A C T

The purpose of this study is to examine the effect of credit risk and liquidity risk on profitability with loan restructuring and income diversification as moderating variables. The research population is all general banking companies, which were listed on the Indonesia Stock Exchange (IDX) during the period 2018-2021. The research sample was created using the purposive sampling technique and 160 observations were obtained. This study conducts panel data regression analysis using EViews 12 software. The results of this study indicate that an increase in credit risk reduces profitability, liquidity risk does not affect profitability, a loan-restructuring strategy can reduce the effect of credit risk on profitability, and an income-diversification strategy can reduce the effect of liquidity risk on bank profitability. The research findings provide an understanding of banking strategy, namely loan restructuring and income diversification can increase banking profitability under urgent conditions. This study provides support for contingency theory and stakeholder theory. The limitation of this research is that it does not discuss Islamic banking because the policies of those companies are different in terms of rules and there are limited data.

1. Introduction

The performance of management is on behalf of the company. Performance is assessed from the company's ability to earn profit and manage risk. Profitability describes how much a company utilizes its assets to create earnings (Brigham & Daves, 2018). The risks that are often faced by banks are credit risk and liquidity risk. Credit risk arises because there are non-performing loans. Liquidity risk occurs when a bank lacks cash to meet maturing obligations. The profile of the banking industry published by the Indonesian Financial Services Authority (OJK) for the period 2018 to 2021 is illustrated in Fig. 1. The industry profile describes banking conditions where there is an increase in credit risk as assessed by non-performing loans (NPL) and a decrease in profitability resulting from the value of return on assets (ROA). The largest increase in credit risk occurred in 2020, followed by a decline in profitability. Data from the OJK for 2020 indicate an increase in credit risk due to the large number of debtors who were in arrears on debt payments. The category of debtors who were in arrears for at least 1 to 2 months (collectibility level 2) increased by 27.3 percent year-on-year (YOY). The number of credit categories from non-current (collectibility level 3) to non-performing (collectability level 5) increased by 19.10 percent. The decline in revenue and net profit as of March 31/April 30 2020 was negative 25 percent.
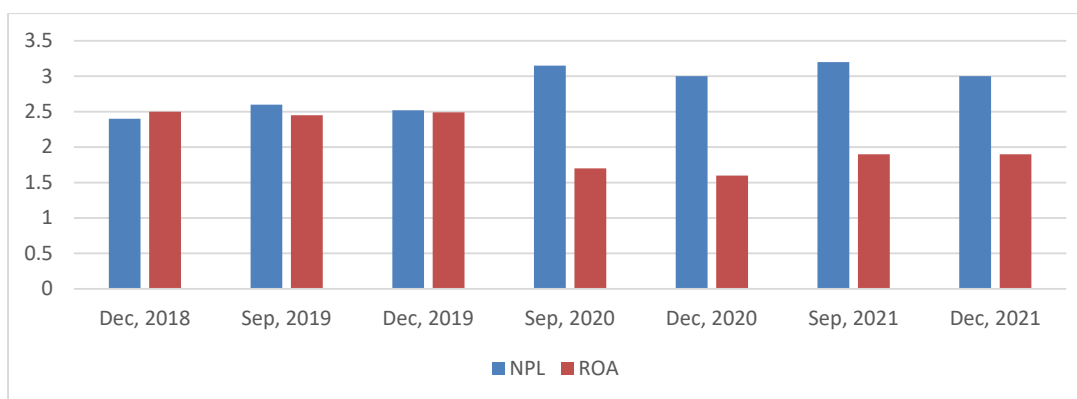
Fig. 1. Profile of the Banking Industry in Indonesia 2018 to 2021

Based on these data, there was an increase in credit risk, liquidity risk, and a decrease in profitability in banks in Indonesia. Loans that are not paid will increase the risk of default and if this continues, it will cause bad credit which can have an impact on bank liquidity and profitability (George & Hwang, 2010;Thomas, 2020). The risk of increased uncertainty will have the impact of reducing bank profitability (Abdelaziz et al., 2020).

The Indonesian securities rating agency also stated that the number of debtor profiles in the high-risk and very high-risk categories continued to increase, reaching 45.2 percent in July 2020 compared to 41.2 percent in December 2019 of, consisting of commercial banks, rural banks (BPR), and finance companies (Thomas, 2020). Banks with high credit risk and high liquidity risk will have bankruptcy risk. If a bank operates in an environment with high uncertainty, for example in crisis conditions, it will have difficulty controlling the company's operations (Menicucci and Paolucci, 2016). High credit risk and high liquidity risk can reduce bank profitability, thereby impacting investor decisions (Moeljadi et al., 2020; Cherubini & Lunga, 2001; Tilman & Cohler, 2001; Duffy et al., 2005).

Profitability is very important for companies. They have an obligation to convey information about their profitability to stakeholders according to stakeholder theory (Freeman, 1983). The results of previous research have indicated that credit risk affects profitability when debts that are not paid on time reduce revenue and increase the cost of allowance for impairment losses which affects company profitability (Abdelaziz et al., 2020). Other research results from (Mendoza & Rivera, 2017;Pepur & Tripovic, 2017; Madugu et al., 2020) explain that credit risk has a negative effect on profitability. Increased credit risk can potentially reduce cash which has an impact on the risk of lack of funds or liquidity risk. Banks experience a lack of liquidity when they are unable to maintain third-party funds due to bad loans. This situation causes increased liquidity risk which will have an impact on profitability (Abdelaziz et al., 2020; Reschiwati et al., 2020; Jihadi et al., 2021). Under urgent conditions, such as a crisis or when there is post-crisis lending, there is a relatively big potential for liquidity risk and a decrease in bank revenues because there is a possibility that many debtors will experience financial difficulties caused by the crisis. Large credit distribution with high liquidity risk reduces bank profitability, especially in abnormal conditions (Madugu et al., 2020; Abbas et al., 2019). Liquidity risk reduces bank performance (Marozva, 2015; Athanasoglou, 2006; Abbas et al., 2019; Madugu et al., 2020), especially in crisis conditions.

The results of other studies have shown that increased credit risk has a positive effect on profitability because debtors' loan guarantees have a greater selling value than bank loans (Tan, 2013; Oleiwi et al., 2019). Empirical research on how credit risk and liquidity risk affect profitability has yielded different or inconsistent results. The authors suspect that there are other variables that can influence the effect of credit risk and liquidity risk on profitability. The contingency theory approach argues that banks will try to reduce the risk of bad credit with strategies to maintain profitability in urgent situations (Lawrence & Lorsch, 1967; Donaldson, 2001).

Organizational strategies provide a more effective direction for achieving long-term goals (David, 2011). The banking strategy for dealing with credit risk is a defensive strategy whereby problem loans are reorganized. This reorganization can be in the form of providing relief to debtors through a loan-restructuring policy by reviewing loans and providing rescheduling for loans where there is a problem. Several empirical studies support loan-restructuring strategies that can help debtors survive and at the same time maintain bank profitability (Bawa & Basu, 2020;Azhari and Kadir, 2018; Forgione and Migliardo, 2019; Ghosala and Miller, 2019).

Most of the bank's profitability comes from income from the interest on loans. The decrease in disbursed loans had an impact in terms of decreasing loan interest income and profitability. Banks will avoid high-risk activities where the opportunity costs are too large. They will try to increase the scale of operations, serve a wider range of consumer segments, provide more

services, and start increasing their non-interest income. They are also motivated to implement strategies that can reduce liquidity risk. It is suspected that they will carry out an income-diversification strategy.

Several empirical studies explain that product diversification can increase income through the addition of bank products and services that can be enjoyed by customers as they become more complete and of better quality (Fernández et al., 2016). Product diversification is one of the banking strategies to overcome the problem of shortage of income from credit interest and reduce liquidity risk. A strategy that can be selected is concentric diversification, namely the strategy of adding new but still related products (David, 2011:118). Banks seek to create new products in order to diversify and for their income portfolios (Deyoung & Rice, 2004; Elsas et al., 2010; Lepetit et al., 2008) according to the product portfolio theory approach (Devinney et al., 1985). The banking strategy is to increase fee-based income through product diversification, which was less common before the COVID-19 pandemic. This income-diversification strategy clarifies the urgent situation with a contingency approach (Lawrence & Lorsch, 1967; Donaldson, 2001).

The contingency approach is used to respond to urgent situations through corporate strategy. This study tries to provide empirical evidence of moderating variables that can reduce the effect of credit risk and liquidity risk on profitability. The phenomena of increasing non-performing loans and decreasing profits in banks can be reduced by adopting a loan-restructuring strategy and income diversification based on contingency theory and portfolio theory. This research in this study is of interest because it has never been conducted in the context of urgent situations.

2. Literature Review and Hypotheses

2.1. Credit risk and profitability

Credit risk occurs when another party fails to fulfill obligations to the bank, for example, a risk due to debtor failure, credit concentration risk, counterparty credit risk, and settlement risk (POJK, 2016). Theories related to the effect of credit risk on profitability are stakeholder theory and intermediation theory. Based on the theory of banking intermediation, a bank—which is an intermediary institution—is obliged to distribute funds to the public as a form of participation in the turning of the economy's wheels. Funds that are channeled into the economy will be serviced in the form of income from the interest which will become the basis for bank profitability. Loans that have the potential to default will cause credit risk and affect profitability. According to stakeholder theory, information about credit risk and profitability is important for stakeholders to know; it is their right and the company's obligation to convey it (Freeman, 1983; Parmar et al., 2010).

Credit risk in the banking industry was growing during the COVID-19 pandemic because many debtor companies were experiencing financial losses and difficulties. The more problem loans there were, the more a bank's credit risk would increase and its income decrease, which, in turn, would reduce the bank's profitability (Abdelaziz et al., 2020; Mendoza & Rivera, 2017; Pepur & Tripovic, 2017).

Research by (Madugu et al., 2020) explains that the smaller the credit risk, the more profitability will increase, and thus the health of the bank will be maintained. Increased credit risk will reduce the bank's ability to generate profits thereby affecting profitability. Based on the theoretical description and empirical studies, the research hypothesis is:

H₁: *Credit risk has a negative effect on profitability.*

2.2. Liquidity risk and profitability

Stakeholder theory states that a company is not an entity that operates for its own sake, but must instead provide benefits to its stakeholders, namely shareholders, creditors, consumers, suppliers, government, community, analysts, and other parties. The existence and continuity of a company is strongly influenced by the support of its stakeholders. Liquidity risk occurs when management makes a decision to provide maximum credit in the hope of obtaining high income from interest. Management will provide this information by explaining how the bank maintains liquidity by monitoring the credit disbursed as well as explaining everything in its financial reports which can be read by all stakeholders. Some of the information that can be provided regarding liquidity risk includes the bank's efforts to maintain and control the loans it disburses with procedures that are in accordance with bank and government regulations. Information about the level of liquidity risk is one of the types of information that affect the level of profitability (Freeman, 1983; Parmar et al., 2010).

Profitability is very important for companies. Banks will try to channel maximum credit from their funds to obtain high income and profits. The more credit is given to the debtor, the more the liquidity risk will increase when third-party funds may be disbursed by the customer. Several empirical studies have explained how the value of liquidity affects profitability more intensively than capital (Madugu et al., 2020; Abdelaziz et al., 2020). A high level of credit distribution carries the risk of debtor default and liquidity difficulties. The impact of liquidity risk causes an increase in the cost of allowance for impairment losses which can reduce bank profitability as demonstrated by empirical results (Abdelaziz et al., 2020; Marozva, 2015; Athanasoglou, P.P., 2006). Increased liquidity risk will reduce profitability in commercial banks in post-crisis or urgent situations as demonstrated by empirical studies (Madugu et al., 2020; Abbas et al., 2019). Liquidity risk is thought to reduce a bank's profitability performance, especially in crisis and urgent situations. Based on the description of the theory and empirical studies, the research hypothesis is:

H₂: *Liquidity risk has a negative effect on profitability.*

2.3. Loan restructuring reduces the effect of credit risk on profitability

Several empirical studies have explained that credit risk will reduce bank profitability. Loans provided by banks have the potential to become non-performing credit risks. Problematic credit arises when the repayment of bank loans by debtors is no longer smooth. The more non-performing loans to the total credit given, the bank's income will decrease. Empirical results indicate that credit risk reduces a bank's ability to generate profits (Abdelaziz et al., 2020; Oleiwi et al., 2019; Moeljadi et al., 2020; Cherubini & Lunga, 2001; Tilman & Cohler, 2001). The results of other empirical studies show that credit risk can increase profitability. The results of the study justify banks providing loans to debtors with strict credit conditions, especially collateral in the form of assets that are worth more than the loan. Banks have larger collateral assets to cover debtors' credit problems in the event of bad credit. (Tan, 2014; Oleiwi et al., 2019). Previous empirical studies have shown that there are inconsistencies in the results, so this study contributes by using loan-restructuring strategies—that could weaken the effect of increased credit risk on profitability—as the moderating variable.

Contingency Theory (Lawrence & Lorsch, 1967; Donaldsan, 2001)is used in this study to provide support for the strategies undertaken by banks in reducing credit risk that can affect their performance. The situation of urgency in this research is that the increase in bad loans during a pandemic is thought to be overcome by a restructuring strategy. Loan restructuring aims to save bank credit as well as save the debtors' businesses so that they return to health. Banks that have low profitability tend to have a better chance of restructuring(Bawa & Basu, 2020; Azhari & Kadir, 2018; Forgione & Migliardo, 2019; Ghosala, 2019). Based on the description of the theory and empirical studies, the research hypothesis is:

H₃: *Loan restructuring reduces the effect of credit risk on profitability.*

2.4. Income diversification reduces the effect of liquidity risk on profitability.

Most of the bank's income comes from the interest on loans. During a crisis, banks are faced with the risk of default by debtors, which means that liquidity risk has the potential to occur. Extensive distribution of credit can increase bank profitability under normal conditions (Abdelaziz et al., 2020; Saleh and Abu, 2020; Ebenezer et al., 2019a; Ebenezer, et al., 2019b). However, in abnormal or urgent conditions, for example in crisis situations, extensive credit distribution has the potential to increase liquidity risk and reduce profitability (Abbas et al., 2019). Liquidity risk reduces bank performance (Marozva, 2015; Athanasoglou et al., 2006).

Empirical studies have yielded inconsistent research results on the effect of liquidity risk on profitability. This study recommends that income diversification is used to reduce the effect of liquidity risk to profitability. Income diversification in this study is related to portfolio theory which explains that, in order to reduce losses on one type of income, companies can seek and create portfolios comprising other income sources (Cheng & Deets, 1971; Devinney et al., 1985). Income diversification can also be linked to contingency theory which explains that a company's strategy to survive during the COVID-19 pandemic was to diversify its sources of revenue (Lawrence & Lorsch, 1967; Donaldson, 2001). Income diversification means variety in terms of the sources and types of income. Income diversification aims to reduce the risk that occurs because a company only focuses on one source of income.

Diversification of bank income can increase company profitability (Deyoung & Rice, 2004; Elsas et al., 2010; Lepetit et al., 2008). Operating income, including fee-based income can increase a bank's profits and reduce systemic risk. Non-interest income activities affect a bank's performance in accordance with the risks. Income diversification can overcome the problem of lack of liquidity and can increase a bank's profitability (Gurbuz, et al., 2013; Lee, et al., 2014; Meslier et al., , 2014; Zhou, 2014; Senyo et al., 2015). Income diversification plays an important role in bank performance because it can reduce liquidity risk from the possibility of problems with interest income on non-performing loans (Abedifar et al., 2018; Brahmana et al., 2018; Luu et al., 2019; Ali and Khattak, 2020). Based on the description of the theories and empirical studies, it is thought that income diversification reduces the effect of liquidity risk on profitability, therefore the research hypothesis is:

H₄: *Diversification of income reduces the effect of liquidity risk on profitability.*

3. Research Methodology

3.1 Research Sample and Data Collection

The subjects of this study are all commercial banks listed on the Indonesia Stock Exchange (IDX) during the period 2018 to 2021. The sampling technique is non-probability sampling using a purposive sampling technique. This method uses specified criteria and considerations. The criteria for determining the companies included in the sample are (1) they are banks that were listed on the IDX during the period 2018 to 2021, (2) they are commercial banks and not Islamic banks, and (3) they have complete data on their operations during the observation period. The research sample is described in Table 1.

Table 1
Research Sample

No.	Notes	Total
1	Banks listed on the IDX during the period 2018-2021	46
2	Islamic banks (syariah)	(4)
3	Incomplete data because these banks were only IDX-listed after 2020	(2)
	Number of banks in the sample	40
	Total observations over 4 years	160

Source: idx.co.id (2022)

This study did not consider Islamic banks for inclusion because they have different policies. The researchers use the time period from 2018 to 2021 due to the increase in credit risk, the decrease in profitability, and the decrease in lending that were seen during this period.

3.2 Variable Measurement

This study examines the effect of credit risk and liquidity risk (independent variables) on profitability (the dependent variable) with a loan-restructuring strategy and income diversification as moderating variables. The measurement of the research variables is explained in Table 2; the measurements used are based on previous empirical studies (Ebenezer et al., 2018; Madugu at al., 2020; Abdelaziz et al., 2020; Ebenezer at al., 2019; Mendoza & Rivera, 2017; Abbas et al., 2019; Oleiwi et al., 2019; Saleh & Abu Afifa, 2020; Tran & Phan, 2020; Cem & Christopher, 2015; Kiweu, 2012; Abuzayed et al., 2018).

Table 2

Type of the variable	Variable	Operationalization	Measurement
Independent Variable	Credit Risk (CR)	Potential gains or losses due to changes in the debtor's creditworthiness.	Non-Performing Loan (NPL)
Independent Variable	Liquidity Risk (LR)	The ability of a bank to repay the funds deposited by the customer.	Loan Deposits Ratio (LDR)
Dependent Variable	Profitability (Profit)	A bank's profits relate to the overall resources or assets that it has.	Return On Asset (ROA)
Moderation Variable	Loan Restructuring (Restruc)	Policies provided by a bank to debtors who have problem loans.	Loan restructuring/ Total loans granted
Moderation Variable	Income Diversification (Diver)	The amount of income other than from interest that contributes to a bank's total income.	Herfindahl Hirschman Index (HHI)

Definitions of the variables
Source: observavasations by the authors (2022)

3.3 Research Model

This study uses a panel data regression equation model with a software tool called EViews 12 to test the hypotheses. This testing uses a significant level of $\alpha = 0.05$ or 5 (five) percent. The appropriate regression model used is based on the Chow test, Hausman test, and Lagrange Multiplier test is the Random Effect Model (REM). The research model equation is as follows:

$$Profit = \beta_0 + \beta_1 CR_{i,t} + \beta_2 LR_{i,t} + \beta_3 Restruc_{i,t} + \beta_4 Diver_{i,t} + \beta_5 CR_{i,t} \times Restruc_{i,t} + \beta_6 LR_{i,t} \times Diver_{i,t} + \varepsilon_{i,t}$$

This research model examines the effect of credit risk (CR) and liquidity risk (LR) on profitability (Profit) with loan restructuring (Restruc) and income diversification (Diver) as the moderating variables. If the significance value of the probability variable is <0.05 then the alternative hypothesis is accepted.

4. Empirical analysis

4.1 Descriptive Analysis

Table 3 shows the descriptive statistics of the research variables. It also shows the indicators for the number of observations (N), the minimum, maximum, mean, and standard deviation values. The profitability ratio values for all samples range from -5.192 to a maximum value of 5.19 percent with an average of 0.6119 percent which indicates that the average profitability value is low. The credit risk (CR) ratio ranges from 0.01 to 5.4 percent with an average of 1.95 percent which indicates that the average credit risk value is still healthy, that is to say, below 5 percent according to Bank Indonesia (BI) regulations. The liquidity risk (LR) ratio ranges from 39.33 percent to 139.23 percent with an average value of 83.061 percent, which is still in good health. Loan restructuring has a range of 0.01 percent to 68.99 percent with an average of 12.97 percent which is still normal. Income diversification ranges from 4.25 to 49.98 percent with an average value of 30.82 percent, meaning that the banking income mix is diverse.

Table 3

Descriptive Statistics of Variables for Commercial Banks

Variable	N	Minimum	Maximum	Mean	Std.Dev.
Profit	160	-5.1920	5.1900	0.6119	2.2547
CR	160	0.0100	5.4000	1.9476	1.3893
LR	160	39.3300	139.230	83.061	19.780
Restruc	160	0.0100	68.986	12.973	12.1191
Diver	160	4.250	49.98	30.82	12.54

Source: processed data (2023)

4.2 Regression Results

The research hypothesis was tested using panel data regression analysis. Based on the results of the Chow test, Hausman test, and Lagrange Multiplier test, the Random Effect Model (REM) is the most appropriate model to use in this study. Table 4 shows the results of the testing of the random effects regression model for panel data.

Table 4.

Results of the Random Effects Regression Model for Panel Data

Variable	Coefficient	Probability
CR	-1.215740	0.0000
LR	-0.015614	0.3339
Restruc	-0.024824	0.1805
Diver	-10.92102	0.0087
CR_Restruc	0.015036	0.0469
LR_Diver	0.152814	0.0024
C	3.692302	0.0091
R-squared		0.5141
Adjusted R-squared		0.4950
Durbin-Watson statistic		2.1462
ANOVA test, Prob(F-statistic)		0.0000

Source: processed data (2023)

The results of the panel data regression analysis in Table 4 show that the adjusted R-squared value is 51.41 meaning that the independent/moderating variables in the model can explain the dependent variable by 51.41 percent while the remaining 48.49 percent is explained by other variables outside the model. The results of the ANOVA test can be seen from the value of the F-statistic which has a probability of 0.0000<0.05, so the model is said to be feasible. The results of the autocorrelation test show that the statistical value of Durbin-Watson (DW) is 2.1462. The DW statistical value must be between upper bound (du) and 4-du to be free from autocorrelation. Based on the DW table, du value = 1.8198 and 4-du value = 2.1802, so there is no autocorrelation in this equation.

The results of testing the first hypothesis indicate a regression coefficient of -1.2157 and a significance value of 0.0000, and then, statistically, an increase in credit risk (CR) decreases company profitability, so **the first hypothesis (H₁) is accepted**. The results of testing the second hypothesis indicate a regression coefficient of -0.0156 and a significance value of 0.3339 greater than $\alpha = 0.05$, meaning liquidity risk (LR) does not affect profitability; so **the second hypothesis (H₂) is rejected**. The results of testing the third hypothesis indicate a regression coefficient of 0.0150 and a significance value of 0.046, meaning, statistically, the restructuring strategy is able to reduce the effect of credit risk (CR) on profitability, so **the third hypothesis (H₃) is accepted**. The results of testing the fourth hypothesis indicate a regression coefficient of 0.1528 and a significance value of 0.0024, meaning, statistically, income diversification is able to reduce the influence of liquidity risk and increase bank profitability, so **the fourth hypothesis (H₄) is accepted.**

5. Discussion

The first finding of this study is that an increase in credit risk will decrease profitability. Banks will experience a decrease in income and profitability when loans given to customers are not repaid smoothly, meaning that they can cause bad credit (Mendoza & Rivera, 2017). These results demonstrate that the bank is trying to maintain and control the non-performing loan ratio so that it remains in a healthy condition in order to provide confidence to stakeholders in accordance with stakeholder theory (Freeman, 1983; Parmar et al., 2010). The results of this study are also in line with the intermediation theory according to which banks extend credit to the public in order to obtain maximum profitability and remain in a healthy condition (Gurley, 1956). The results of this study support the empirical findings of (Madugu et al., 2020) which demonstrated that the level of credit risk is important for assessing the soundness of a bank. Research by (Pepur & Tripovic, 2017) explains that banks engage in credit risk management to reduce operational costs and increase profitability. The results of this study provide empirical evidence that increasing credit risk reduces profitability in line with previous research (Mendoza & Rivera, 2017; Ebenezer et al., 2018; Ebenezer et al., 2019; Ebenezer et al., 2019; Moeljadi et al., 2020; Penela et al., 2019; Reschiwati et al., 2020).

The second finding of this study is that liquidity risk does not affect profitability. The results demonstrate that banks have an Asset-Liability Committee (ALCO) which acts as the most senior management forum for monitoring the bank's liquidity situation. The ALCO is responsible for determining policies and strategies related to bank assets and liabilities with the principle of prudent management of liquidity risk. The ALCO approves the liquidity assumptions and stress-testing scenarios implemented by the bank so as to reduce liquidity risk. The bank always explains strategies related to assets and liquidity in the notes that form part of financial reports. The results of this study confirm that banks always maintain customer trust as providers of funds by instilling confidence that third-party funds are channeled responsibly. This is done so that liquidity risk is relatively small which does not affect profitability because the risk has been minimized. These results confirm that liquidity risk does not affect profitability because liquidity risk has been managed properly by a bank's management. The results of this study differ from those of (Abdelaziz et al., 2020) who state that liquidity risk has a positive effect on profitability. This is not in line with the results of other research (Abdelaziz et al., 2020; Madugu et al., 2020; Ebenezer et al., 2019) which show that liquidity risk reduces profitability and the value of liquidity affects profitability more intensively than capital. The results of this study align with the research of (Binsaddig et al., 2023; Harban et al, 2021; Oudat & Ali, 2021)

The third finding is that restructuring reduces the negative effect of credit risk on profitability. Restructuring is a defensive strategy to overcome the increase in non-performing loans and reduce credit risk. Loan-restructuring policies that are carried out include providing relief to debtors through a policy of reviewing loans given and or providing rescheduling for problem loans (Burakov, 2014; Schütte, 1993; Kim et al., 2019). The results of this study support the contingency theory approach which states that a loan-restructuring strategy is a solution used to mitigate credit risk and maintain a bank's performance, namely profitability, and this finding supports previous empirical studies (Burakov, 2014 Demiroglu, 2015; Demiroglu & James, 2015; Forgione & Migliardo, 2019; Ghosala, 2019; Jiang et al., 2021; Jiang et al., 2019; Kim et al., 2019; Marin et al., 2015; Noe, 2000; Damayanthi et al.,2022).

The fourth finding is that income diversification reduces the effect of liquidity risk on profitability. With more income diversification, a bank's profitability increases and liquidity risk decreases. Income diversification is where income comes from many non-interest and fee-based sources such as fees and commissions on loans, down payments, commission fees on securities trading income, other administrative costs, and income from dividends and foreign exchange (Kiweu, 2012; Abuzayed et al., 2018). The income portfolio adds to the bank's sources of non-operating income which are able to increase profitability as described by existing research (Deyoung & Rice, 2004; Elsas et al., 2010; Gurbuz et al., 2013; Lee et al., 2014; Senyo et al., 2015). The findings confirm the product portfolio theory approach; income diversification reduces losses on one type of income, so banks form a portfolio of sources of income other than interest from loans (Cheng & Deets, 1971; Devinney et al., 1985). The results of this study also confirm the contingency theory view that banks, in maintaining liquidity and profitability levels, create policies based on an income-diversification strategy to reduce the risk stemming from shortages in liquidity, especially during a cash crisis such as during the COVID-19 pandemic (Lawrence & Lorsch, 1967; Donaldson, 2001).

6. Conclusions and Suggestions

A high level of credit risk can reduce a bank's revenue and profitability. In order to generate maximum profitability, banks establish policies to maintain and manage credit risk. The policies enacted include re-checking the criteria for granting credit, credit approval, pricing, monitoring, management of non-performing loans, and portfolio management. Liquidity risk does not affect bank profitability. Increasing or decreasing liquidity risk does not affect profitability because liquidity risk has been minimized by the bank before credit is disbursed. The loan-restructuring strategy reduces bad loans meaning that the financial condition of banks and companies is maintained in urgent situations. The revenue-diversification strategy reduces the effect of liquidity risk on profitability. The bank's income-diversification strategy is to add other sources of income besides income from interest on loans with Fee-Based Income (FBI). A bank's income sourced from FBI includes fees and commissions; fees for other services; gains (losses) from changes in the fair value of financial instruments measured at fair value through profit or loss; gains (losses) that have been realized on derivative instruments; gains on transactions in foreign currencies; dividend income; share of net income of associates; and gain on sales of securities and government bonds.

The limitation of this study is that it does not test Islamic bank companies due to limited data. Therefore, in future studies, it would be possible to add a sample of Islamic banks and carry out a comparative test.

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