Factors Affecting Non-Performing Loans of Commercial Banks in Malaysia

Intan Suhaila Maulad Haji Md Isa[1], Raziah Bi Mohamed Sadique[2], Norhayati Alias[3] & Noor Hasniza Haron[3]

[1] UOB Bank Malaysia, Damansara Utama, 47800, Selangor, Malaysia

[2] Faculty of Accountancy, Universiti Teknologi MARA (UiTM), Cawangan Negeri Sembilan Branch, Kampus Seremban, 70300 Seremban, Negeri Sembilan, Malaysia

[3] Faculty of Accountancy, Universiti Teknologi MARA (UiTM), 40450, Shah Alam, Selangor, Malaysia

Correspondence: Norhayati Alias, Faculty of Accountancy, Universiti Teknologi MARA (UiTM), 40450, Shah Alam, Selangor, Malaysia. E-mail: norha927@uitm.edu.my

Received: August 30, 2023 Accepted: October 10, 2023 Online Published: October 16, 2023

doi:10.5430/afr.v12n4p32 URL: https://doi.org/10.5430/afr.v12n4p32

Abstract

With the economy's growth, the banking industry expands, and the competitiveness intensifies with the increased number of banks. Nevertheless, its non-payment also leads to huge losses for banks and the country. One of the critical determinants of the banking sector's performance is the loans advanced to get the profit. Therefore, the loans and their repayments are used as the comparison. Specifically, banks note their repayments seriously, and those default loans are declared non-performing loans (NPLs). Thus, NPL indicates a country's banking system's health. This study investigates the factors influencing Non-Performing Loans (NPLs) in the commercial banking sector of Malaysia from 2012 to 2021. NPLs are considered a crucial indicator of the banking system's health and the overall economic health of a country. The study examines the relationship between bank-specific and macroeconomic factors and their impact on NPLs. The bank-specific factors analyzed are loan-to-deposit ratios, capital adequacy ratios, and bank size. In contrast, macroeconomic factors are unemployment, inflation, and gross domestic product. Data were collected from published annual reports, the World Bank website, and DataStream navigators for ten years from 2012 to 2021, involving 26 commercial banks in Malaysia. Data analysis includes Descriptive Analysis, Correlation, Multicollinearity, and Multiple Regression Analysis using SPSS version 20 software. The result indicates that loan-to-deposit ratio, bank size, unemployment rate, and gross domestic product significantly impact the NPLs in the Malaysian Commercial Banks industry. Meanwhile, the capital adequacy ratio and inflation rate did not affect the NPLs in Malaysia.

Keywords: non-performing loans, bank-specific factors, macroeconomic factors

1. Introduction

Non-performing loans (NPLs) have gained prominence, particularly after economic downturns, financial crises, and unexpected events that strain borrowers' ability to meet their financial commitments. Instances of NPLs can emerge due to factors such as economic instability, rising interest rates, unemployment, and market fluctuations. In the context of NPLs, understanding the interconnectedness between borrowers, financial institutions, and broader economic conditions is crucial. The concept of non-performing loans (NPLs) is rooted in financial institutions' lending and borrowing practices. NPLs are loans borrowers have failed to repay according to the agreed terms and conditions, leading to financial distress for both borrowers and lenders. According to Islam (2020), NPLs affect the bank's liquidity and profitability, which is one of the significant components of the overall bank performance. The rise in NPLs leads to diminishing income in the economy. In addition, when they set aside more cash, they can procure progressively through the bank's loan costs. As a result, the bank will utilize its cash for loaning exercises and win the financing cost benefits (Mohamed et al., 2021). Therefore, the number of NPLs within a bank should be controlled due to their effect on its sustenance and the economy's survival (Islam, 2020).

1.1 Problem Statement and Significance of the Study

According to a previous study by Karadima and Louri (2021), a consumer loan over its balance constitutes a key indicator of loan default prediction, while the ratios of the installment and the actual payments of a loan over the

personal income of the borrower reduce the probability of default, thus suggesting that the payment rates of consumer loans could increase if loan installments were adjusted to borrowers' income. In addition, the lending activities of commercial banks are faced with the risk of default by some individuals and companies who cannot meet their debt payment obligations on time. Some individuals cannot fully repay, while others can only pay a small portion of the loans, resulting in accumulated NPL (Budiarto, 2021). Therefore, generally, the primary objective of this study is to investigate the factors affecting the non-performing loans of commercial banks in Malaysia from 2012 to 2021.

Borrower decisions are often at the core of the non-performing loan (NPL) issue. Many NPLs arise because borrowers choose without considering future implications and financial obligations. In some cases, individuals qualify for loans without adequately assessing their ability to manage repayments and cover other essential expenses. Sudden shifts in the market can significantly impact the loan landscape by altering borrowing capacity and payment capabilities. If the market suddenly changes and the prices of products increase due to shortages or superior demands, borrowers will have less money to pay their loans, which can lead to greater non-performance (Zeleke, 2018). The consequences of NPLs extend beyond individual borrowers. Banks experience diminished profitability and reduced capital base due to NPLs. These challenges influence banks' willingness to take on new risks and engage with new customers. The growing prevalence of NPLs among various entities and individuals has a substantial negative impact on both financial stability and the overall economy of a country. Additionally, as the volume of NPLs increases, banks need to allocate more funds for loan loss provisions. This reduction in revenue due to provisions further compounds the financial challenges. The combination of these negative influences ultimately jeopardizes the bank's sustainability. An increase in NPLs' provision reduces revenue. As a result of the negative impact on bank survival, the determinants of NPLs should be given significant consideration (Gezu, 2014).

Hirnissa et al. (2020) explored the determinants of problematic loans among non-bank financial institutions in Malaysia; the study used a quantitative research design and collected data through a survey of customers and non-bank financial institution managers. The findings suggest that factors such as the financing offered, the level of risk associated with the loan, and the level of customer experience play a role in determining the level of problematic loans in Malaysia. At the same time, Kepli et al. (2021) examined the relationship between NPLs and macroeconomic variables in Malaysia. The study used time series data and applied econometric techniques such as cointegration analysis and vector error correction modeling. The findings suggest that macroeconomic factors such as inflation, gross domestic product, and exchange rate play a role in determining the level of NPLs in Malaysia.

NPLs are a significant source of economic stagnation since they trigger financial crises. If NPLs are not addressed, it might lead to a financial disaster. As a result, NPL depreciation is required to improve economic growth. Knowing the fundamental cause of a problem is the first step toward resolving it. The research findings provide vital ideas to bank management regarding performance evaluation by identifying the primary causes of NPLs in the banking sector. In dealing with NPL management, as well as bank regulatory bodies. The issue is significantly more pressing at a large, state-owned bank because most resources belong to the public. Ultimately, this study offers commercial banks a fresh perspective on the internal and external factors driving NPLs. It aids in refining governance and policy within these institutions. It also serves as a reference for future research in this field, promoting continued exploration and understanding of NPL-related challenges and their solutions.

The COVID-19 pandemic profoundly impacted Malaysia from approximately 2020 to early 2022. The nation experienced significant challenges during this period due to the pandemic's economic disruptions. The effects were particularly felt through job losses and economic contraction. In response to the hardships faced by Malaysians, the government initiated a moratorium to provide relief for individuals who could not fulfill their loan repayments. Henceforth, reducing NPLs is mandatory to reinstate a sound banking system and stand in complete financial constancy. (Hosen et al., 2020). This study aimed to identify the factors contributing to NPLs in the banking industry. The research analyzed both bank-specific and macroeconomic factors to provide a comprehensive understanding of the issue. The findings of this study aim to help financial institutions and policymakers better understand the underlying causes of NPLs and make informed decisions to mitigate their impact.

1.2 Research Objectives

Malaysia's banking sector experienced the highest NPL ratio in 1998 due to the dire economic situation in 1997. Malaysia's government spent RM 12 billion to rescue several troubled banks. Subsequently, the Malaysian government has taken other actions through the Corporate Deby Restructuring Committee (CDRD) and Dana modal, which contribute to the government funds, and Dana harta, an agency to acquire NPLs. These measures have reduced NPLs (Loh et al., 2015). Based on this experience, Malaysia was severely hit by Covid-19 from circa 2020 to early

2022. The economy is currently recovering. Many Malaysians lost their jobs, and the government has introduced a moratorium to aid the poor Malaysians who cannot repay their loan. However, the situation worsens when OPR keeps increasing. Like the 1997 economic recession, the number of NPLs during the pandemic keeps increasing. Henceforth, reducing NPLs is mandatory to reinstate a sound banking system and stand in complete financial constancy. (Hosen et al., 2020).

The study analyzes the factors influencing commercial banks' NPLs in Malaysia. The proportion of NPL loans is one of the determinants of the banking sector's soundness. Thus, the primary goal of this study is to identify and investigate the factors affecting non-performing loans among the commercial banks operating in Malaysia. Thus, the objectives of this study are outlined below:

(1) To examine the relationship between bank-specific factors' effect on NPLs of commercial banks in Malaysia

(2) To examine the relationship between macroeconomic factors and NPLs of commercial banks in Malaysia

1.3 Literature Review and Hypothesis

A bank's goal as a business institution is to profit significantly. Because loans and advances are the most profitable assets, it is eager to lend as much cash as possible. However, banks must exercise caution regarding the security of such advances (Dejene, 2020). NPLs represent the overall performance of the bank. A high level of NPLs indicates a high likelihood of significant credit defaults, impacting banks' profitability and liquidity. Undoubtedly, the efficacy of non-performing loans (NPLs) can be impacted by bank-specific and macroeconomic factors within the commercial banking sector in Malaysia. Bank-specific factors can be regulated by the bank or introduced by a central bank to keep these elements under control (Makri et al., 2014). Macroeconomic variables, on the other hand, describe economic situations that are frequently uncontrollable, and policymakers must take them into account when developing policies (Messai & Jouini, 2013). Vaicondam et al. (2019), the macroeconomic environment affects the portfolio quality of debt and loans held by banks. This is because borrowers can pay off their obligations in a more stable economic environment, resulting in lower rates of defaults and late payments.

Gambo et al. (2017) found a significant positive relationship between loan-to-deposit rate (LDR) and NPL because customers' deposits are mainly used for loans, which variably turn into NPLs. Similarly, Bhattarai (2018) studied to assess Nepalese commercial banks' internal and macroeconomic factors as determinants of NPLs. The study found a positive relationship between LTD and NPLs. The higher the LTD, the higher the NPLs in the regression analysis. Total loan and advance to total deposit have a positive and significant relationship with NPLs. The result implies that when LTD increases, NPLs also increase. Yulianti et al. (2018) analyzed the effect of capital adequacy and bank size on NPLs in Indonesian Public Banks through panel data covering 2012 to 2016. However, the result reveals that the LTD has a significant and negative effect on the NPL with a coefficient value of -0.002. In other words, when the bank can increase the LTD level as an indicator of credit expansion, the level of risk of NPLs will decrease. Thus, this study hypothesis:

H1: There is no significant relationship between LDR and NPLs.

The study conducted by Abebe (2021) investigated the factors influencing non-performing loans (NPLs) in commercial banks operating in Ethiopia. The result shows that the capital adequacy ratio (CAR) positively and significantly affects loan default. This indicates that extensively exploited banks are not under regulatory pressure to reduce their credit risk and take more risks. This study, supported by Wood & Skinner (2018), utilized a multiple regression model, including several macroeconomic and bank-specific variables, using aggregate annual data from 1991 to 2015. They found that the positive impact of CAR on NPLs indicates that well-capitalized banks in Barbados can utilize their capital to absorb the risk associated with their loan portfolios. Koju et al. (2018) found that capital adequacy is negatively significant with the NPLs, which means that thinly capitalized banks generally grant loans to riskier borrowers, potentially leading to higher NPLs. Hence, the hypothesis is as follows:

H2: There is no significant relationship between CAR and NPLs.

Thanh et al. (2020) discovered that the bank's size (SIZE) is a significant indicator of NPLs. Positively correlates with NPLs, implying that the "too-big-to-fail" concept is accurate in Vietnam. Although the coefficient is tiny, a moral hazard exists in the listed banking system, and larger banks tend to expose themselves to riskier operations. Curak et al. (2013), the bank size had a significant and detrimental impact on NPLs. In other words, a company's bank size may be determined by its total assets, total sales, average sales rate, and total assets. Thus, problematic loans may become less of an issue as a public company's bank's assets increase. On the contrary, Yulianti et al. (2018) research findings indicate a negative relationship between the bank size and non-performing loans (NPLs) at the Bank of the General Company of Indonesia. This conclusion was derived from analyzing multiple regression

estimates using the Fixed Effects Model (FEM). The research is supported by Mohamad Zain et al. (2020). Their findings found that the size of the bank is negative and insignificant—the larger the size of the bank, the fewer loan defaults. The larger banks are only sometimes more effective in screening loan customers. The study hypothesis:

H3: There is no significant relationship between Bank Size and NPLs.

Sunday et al. (2020) researched determinants of non-performing loans in Uganda's Commercial banking Sector and found that the unemployment rate (UR) has a positive impact. Further, Mazreku et al. (2018) studied determinants of the level of NPLs in commercial banks of transition countries. They study macroeconomic factors affecting NPLs in transition economies using panel data from 2006 to 2016. They found a strong positive correlation between NPLs and UR. Higher URs increase NPLs since more people struggle to pay their loans. In contrast, Nargis et al. (2019) found that the inflation rate and unemployment rate are adversely connected to NPLs, whereas the real interest rate and one-period lag value of NPL are positively related. Thus, the hypothesis is:

H4: There is no significant relationship between UR and NPLs.

Kartikasary et al., (2020) analyse the factors affecting the NPLs in Indonesia. Their result is supported by a study from Thanh et al. (2020), which found that the inflation rate (IR) positively impacts NPL. Increased inflation usually raises interest rates. Inflation merely raises nominal pay. As a result, borrowers pay higher interest rates on loans, making it harder to pay them off. Similarly, Umar and Sun (2018) revealed that inflation is a highly significant determinant of NPLs in Chinese banks, and the link is positive. An increase in inflation lowers borrowers' loan servicing capacity, which raises NPLs. Likewise, Khan et al. (2020) found that the inflation coefficient is substantial and adverse across three models, suggesting that greater inflation levels may cut NPLs due to fewer debt repayments. Higher inflation usually raises interest rates. Vaicondam et al. (2019) studied commercial and Islamic bank NPLs that are adversely connected with IR (-0.575) and have no meaningful value. Wood & Skinner (2018) also found that an improving real economy improves the borrower's debt-servicing capacity, which lowers NPLs. Radja (2016) found that IR is negative and significant at 1%. This shows that rising inflation will lower NPLs since it reduces the value of outstanding debt, making debtors more able to pay. Hence, it is the hypothesis:

H5: There is no significant relationship between IR and NPLs.

Martiningtiyas and Nitinegeri (2020) found that gross domestic product (GDP) boosts profitability. GDP growth decreases with the NPLs ratio. Businesses and individuals profit more when GDP grows. It improves debt repayment and reduces NPLs. Alshebmi et al. (2020) discovered a correlation between GDP and NPLs. They showed that an increase in NPLs causes a drop in GDP of (-0.028340), indicating a slowdown in the economy, which leads to poor growth and higher unemployment. Further, Trung (2019) concluded that the GDP growth rate is not statistically significant but has a negative value and matches original assumptions. According to Wood & Skinner (2018), GDP growth negatively affects NPLs. This shows that a real economy recovery increases borrowers' debt-service ability, reducing non-performing loans. However, economic growth will decrease, increasing NPLs. Thus, GDP and NPL have a negative relationship that affects both (Alexandri & Santoso, 2015). This study hypothesis:

H6: There is no significant relationship between GDP and NPLs.

2. Methodology

This section discusses the methodology used in this study, including the research design, the sample, the research instrument, and the measurement of variables.

2.1 Research Design and Sample

This study employs a quantitative research approach to investigate the determinants of non-performing loans (NPLs) within the commercial banking sector in Malaysia. Secondary data was collected from various sources, including annual reports of commercial banks, financial reports (such as balance sheets and income statements), and reputable platforms like DataStream and the World Bank website from 2012 to 2021. To circumvent the limits of covering the entire population, a sample is drawn to generalize the findings to the entire population. The sample consists of twenty-six commercial banks in Malaysia commercial banks operating in Malaysia. Eight banks are domestically owned, while foreign entities own eighteen. The banks were chosen as the sample in this study using a convenience sampling technique.

2.2 Research Measurement

To achieve the research aim, the study adopted secondary data. The secondary data was collected in the form of ratios from the financial statements of the banking companies that comply with the sample criteria for the ten years of time series data for 2012 to 2021. The study focuses on two independent variables: bank-specific factors

(loan-to-deposit ratio, capital adequacy ratio, bank size) and macroeconomic factors unemployment rate (UR), inflation rate (IR), gross domestic product (GDP)]. The dependent variable is non-performing loan (NPL). NPLs are loans that remain unpaid, and Khan et al. (2020) stated that loans become NPLs if the total principal amount and interest payment are not done on the due date and are no longer expected on future dates. In this study, the NPLs were measured as non-performing loans to total loans and the unit of measurement in percentage. (Alshebmi et al., 2020). Table 1 presents the summary of the measurement of the variables.

Table 1. Measurement of variables

Variables	Code of Variables	Formula	Authors
Dependent			
Non-performing loans	NPL	Total Non-Performing Loan / Total Loan	Makri et al., 2014, Alshebmi et al., 2020
Independent			
Loan to Deposit Ratio	LTD	Total Loan / Total Deposit	Makri et al., 2014
Capital Adequacy Ratio	CAR	Total Equity / Total Asset	Alshebmi et al., 2020
Bank Size	SIZE	Ln (Total Asset)	Dao, 2020, Khanal, 2021
Unemployment Rate	UR	Percentage in the labor force	Makri et al., 2014, I. Khan et al., 2018
Inflation Rate	INF	(CPI0 – CPI1) / CPI1	Wood & Skinner, 2018, Dao, 2020
Gross Domestic Product	GDP	(GDPt0 – GDPt1) / GDPt1	Wood & Skinner, 2018, Dao, 2020,

2.3 Research Instrument

Based on the literature review, the evidence suggests that banks' specific and macroeconomic factors may explain NPLs. The model is a direct relapse work that connects the factors between independent and dependent variables. Hence, the general regression equation is created fundamentally, as shown next.

$$NPL = \beta 0 + \beta 1 LTD + \beta 2 CAR + \beta 3 SIZE + \beta 4 UR + \beta 5 INF + \beta 6 GDP + \mu$$

NPL = the ratio of non-performing loans to total loans of the bank in year t

LTD = loan-to-deposit ratio

CAR = capital adequacy ratio

SIZE = bank size

UR = unemployment rate INF = inflation rate

GDP = gross domestic product β0 - is a constant term

β1, β2, β3, β4, β5 and β6 = coefficients μ = error term / residuals

3. Results and Discussion

The study employed the NPLs ratio as the dependent variable, whereas the explanatory factors were LTD, CAR, SIZE, UR, INF, and GDP. Table 2 presents the average, standard deviation, skewness, kurtosis, minimum, and maximum values of Commercial banks' dependent and explanatory variables in Malaysia from 2012 to 2021.

Table 2. Summary of descriptive statistics of variables for dependent and independent variables

Variables	Mean	Std. Deviation	Minimum	Maximum	Skewness	Kurtosis
NPL	20.09	11.38	.31	58.61	1.73	1.92
LTD	84.32	14.99	43.77	114.70	-.54	-.40
CAR	8.41	2.58	2.46	13.86	-.20	-.64
SIZE	17.65	1.96	13.14	21.55	-.05	-1.03
UR	3.48	.57	2.88	4.61	1.23	-.04
INF	11.01	132.94	-157.89	339.77	1.17	1.31
GDP	-42.96	97.40	-280.51	20.04	-1.62	1.07

The result indicates that the overall average proportion of non-performing loans from commercial banks in Malaysia was 20.09%. A significant portion of the loans disbursed by commercial banks in Malaysia during the sample period were not repaid by borrowers. It may indicate various factors such as economic downturns, borrower financial distress, or inadequate risk assessment by banks. The average LTD ratio ranges from 43.77%. Meanwhile, the average CAR of 8.41% and the average bank size of 17.65% provide insight into the scale of commercial banks' operations. The average unemployment rate of 3.48% reflects joblessness in Malaysia during the sample period—the average inflation rate of 11.01% points to a moderate price increase in goods and services. The average GDP growth rate of -42.96% is quite significant, indicating that, on average, the Malaysian economy contracted during the sample period. This could be due to various economic challenges or recessions. In addition, the result also shows the minimum and maximum of each independent variable in the period under thought. The standard deviation of the ratio of non-performing loans, LTD, CAR, SIZE, inflation rate, and GDP were 11.38, 14.99, 2.58, 1.96, 0.57, 132.94, and 97.40, respectively.

Table 3. Pearson Correlation Analysis

Variables	NPL	LTD	CAR	SIZE	UR	INF	GDP
NPL	1.00						
LTD	.59**	1.00					
CAR	-.02	.29**	1.00				
SIZE	.41**	.04	.47**	1.00			
UR	.47**	.12	.06	.06	1.00		
INF	-.39	.05	.02	-.02	-.56**	1.00	
GDP	.48**	.11	-.02	-.05	.68**	.64**	1.00

**Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows the significant correlation of the findings. The results show a significant, sizeable positive relationship between LTD and NPL (r = .59) and UR with GDP (r = .92). Moreover, a significant, sizeable negative relationship exists between UR and INF (r = -.56) and UR with GDP (r = -.68). Next, there is a significant, medium positive relationship between CAR and Bank Size (r = .47), NPL and Bank Size (r = .41), and NPL with UR (r = .47). Lastly, there is a significant relationship between LTD and CAR (r = .29). As revealed in Table 2, the non-performing loan (NPL) situation in Commercial bank in Malaysia has a positive and robust significant relationship with the loan to deposit ratio (LTD), bank size (SIZE), inflation rate (INF) and gross domestic product (GDP). As also revealed in Table 3, non-performing loan (NPL) negatively correlates with capital adequacy ratio (CAR). The correlation between CAR and NPL is statically insignificant. The inflation rate (INF) was not correlated with the NPL and was insignificant to the NPL.

Table 4. Result of the regression model

Variables	Unstandardized B	Standardized Beta	T	p
Constant	5.18	0.820	3.08	0.00
LTD	0.56	0.52	7.55	0.01**
CAR	0.07	0.13	1.62	0.11
SIZE	0.27	0.26	2.77	0.00*
UR	0.48	0.12	0.68	0.00*
INF	-0.33	-0.60	-0.52	0.61
GDP	-0.19	-0.213	-3.64	0.00*
R-squared Adjusted		0.820		
R-Square		0.801		
F-statistic		10.620		
Prob (F-statistic)		.0000		

*Significant at the 1% level

**Significant at the 5% level

Table 4 shows the overall regression model results for 2012 – 2021. The R-squared value of 0.82 indicates that the regression model explains 82% of the variation in the NPLs ratio, which indicates a strong connection between the independent variables and the NPLs ratio. The F-statistic being significantly lower than the 5% significance level (p-value of 0.05) suggests that the model is statistically significant. Loan-to-Deposit Ratio (LTD) and Bank Size: Both these bank-specific variables have significant relationships with NPLs. LTD's p-value is 0.01 (smaller than 0.05), indicating a significant and positive relationship. Bank Size also has a significant positive impact on NPLs, with a p-value of 0.00. The loan-to-deposit ratio has a significant and positive impact on NPLs. This means that as the ratio of loans to deposits increases, the likelihood of NPLs increases. Similarly, bank size has a significant positive impact on NPLs. Larger banks experience higher NPLs, possibly because they extend more loans. In addition, the study did not find a significant relationship between the capital adequacy ratio and NPLs. This implies that changes in the capital adequacy ratio do not strongly influence NPLs. The Person coefficient of 0.07 and a p-value of 0.11 (greater than 0.05) suggest no significant relationship between CAR and NPLs. The unemployment rate significantly and positively influences NPLs, with a p-value of 0.0000 (less than 0.05). This means that when the unemployment rate increases, NPLs also tend to rise. This could be due to reduced borrower ability to repay loans during economic downturns.

The study does not find a significant relationship between the inflation rate and NPLs, as indicated by a p-value of 0.61 (greater than 0.05). Inflation does not play a significant role in predicting changes in NPLs. GDP is significantly and negatively related to NPLs, with a p-value of 0.000. This suggests that as GDP increases, NPLs tend to decrease. As GDP grows, the NPLs ratio tends to decrease. This suggests that a stronger economy is associated with lower NPLs. The findings collectively provide insights into the factors driving NPLs in commercial banks. Bank-specific variables such as LTD, bank size, and macroeconomic indicators like unemployment rate and GDP play crucial roles in determining NPLs. These insights could guide banks in risk management, lending practices, and economic analysis. Thus, H1, H3, H4 and H5 were accepted. However, the model shows that NPL's capital adequacy ratio and inflation rate are statistically insignificant. Thus, H2 and H5 were rejected.

4. Discussion

The contributions of each variable to explaining the occurrence of NPLs were explained in the regression model in Table 4, which shows that three variables among the six regressors included in the model were statistically significant at a 5% significance level. Variables that were found to be statistically significant include Loan to Deposit Ratio (LTD), Bank Size (SIZE), Unemployment Rate (UR), and Gross Domestic Product (GDP). Those variables were found to be important factors that influence NPLs in the study area. On the other hand, the other two variables, namely Capital Adequacy Ratio (CAR) and Inflation Rate (INF) were statistically insignificant at the acceptable 5% significance level.

4.1 Loan to Deposit Ratio (LTD) and NPL

The empirical results indicate that LTD significantly positively affects non-performing loans. The relationship between loan-to-deposit ratio and NPLs was positive, as expected, and statistically significant at a 5% significance level. The slope of LTD is 0.56. This means that for every one percent increase in loan to deposits, the predicted NPL increases by 0.56% after controlling other independent variables included in the model. In other words, the NPLs ratio increases by 0.56% when LTD increases by one percent, keeping other factors constant. The result suggests that NPLs are more severe when the bank has a higher LTD. Hence, the possible explanation may be that if the increasing rate of banks' lending is high compared to the increasing rate of deposits, the level of NPLs will increase. This is because, at the time of low LTD, banks will tend to lend to low-quality borrowers to earn more from the idle money and do not follow the standard loan collection practices, which leads to the growth in the level of NPLs. In addition, this finding suggests that with the growth in deposits, banks engage in extensive lending, which leads to an increase in bank lending relative to deposits. Such aggressive lending behavior results in banks allocating funds to low-quality borrowers, thereby increasing the riskiness of the loan portfolio and the level of non-performing loans. This study's results align with Bhattarai's (2018) and Gambo et al. (2017) studies. Therefore, the researcher accepted the claim that a positive and statistically significant relationship exists between LTD and NPL (H1).

4.2 Bank Size (SIZE) and NPL

The other significant determinant of NPLs is the size of the banks (log (SIZE)), whose t-statistic equals 2.77. Banks' size has a positive relationship with NPLs. This result is suitable with the findings by Dao (2020), which indicates that the "too-big-to-fail" hypothesis is correct in Vietnam. Although its coefficient is so small, it is undeniable that moral hazard does exist in the listed banking system, and the larger banks tend to expose riskier activities. The same result was derived by Thanh et al. (2020). The positive sign of the coefficient suggests that the NPL of one period is closely related to that of the previous period. This study is inconsistent with the findings of Yulianti et al. (2018) and Mohamad Zain et al. (2020), which showed a negative relationship, indicating that large banks have experienced management with the necessary skills to manage credit risk effectively. Therefore, the researcher accepted the claim that there is a positive and statistically significant relationship between SIZE and NPL (H3).

4.3 Unemployment Rate (UR) and NPL

Focusing on the unemployment rate (UR), based on the result, the coefficient is positive and statistically significant at 1%. These findings evidence the critical role played by the labor market on NPLs. An increase in unemployment implies a decrease in effective demand, i.e., a significant drop in output. This will result in a decline in wealth for households and firms, hence lower income, namely lower ability to repay debts. This translates into an increase in non-performing loans for the financial sector. This finding is consistent with prior studies by Mazreku et al. (2018) and Khan et al. (2018). This outcome stipulates that when jobs are scarce, borrowers are less willing to repay their debts, escalating the level of NPLs. In addition, due to the uncertainty of their employment status, individuals with low-income levels are charged ballooned interest rates, which impairs their capacity to service their loans. However, contrary to the findings of Mohamed et al. (2021), the coefficient value of unemployment showed a negative value; therefore, there is a significant and negative relationship between unemployment and non-performing loans. Therefore, the researcher accepted the claim that a positive and statistically significant relationship exists between UR and NPL (H4).

4.4 Gross Domestic Product (GDP) and NPL

Among the macroeconomic variables, the highest t value is GDP of -3.64. Based on the result, GDP and NPL are statistically significant with negative coefficients of -0.19. This indicates that a one-unit rise in GDP growth leads to a fall in non-performing loans by 0.19 units. As expected, the coefficient estimate of GDP is negative and significant at a 1 percent level. This implies that NPLs are lower during good economic conditions and higher during bad economic conditions. This explanation is supported by previous Trung (2019) and Wood & Skinner (2018) studies. This implies that NPLs are lower during good economic conditions and higher during bad economic conditions, meaning that economic growth usually translates into higher income, improving borrowers' financial capacity. The variant with the finding of Martiningtiyas & Nitinegeri (2020), who obtained a positive result and significant impact on GDP. Therefore, the researcher accepted the claim that a negative and statistically significant relationship exists between GDP and NPL (H6). The summary of the results is presented in Table 5.

Table 5. Summary of the hypotheses

	Hypotheses	P-value	Result
H1	There is a significant relationship between Loan to deposit ratio and NPLs	0.01	Supported
H2	There is an insignificant relationship between Capital adequacy and NPLs	0.11	Rejected
H3	There is a significant relationship between Bank Size and NPLs	0.00	Supported
H4	There is a significant relationship between the Unemployment rate and NPLs	0.00	Supported
H5	There is an insignificant relationship between the Inflation rate and NPLs	0.61	Rejected
H6	There is a significant relationship between Gross domestic product and NPLs	0.00	Supported

5. Conclusion

NPLs are seen as indicators of a country's banking system and economic health, with potential consequences for investment. The study's comprehensive exploration into the factors influencing non-performing loans (NPLs) in Malaysian commercial banks sheds valuable light on the intricate dynamics of the banking sector and its interaction with macroeconomic indicators. By meticulously analyzing bank-specific and macroeconomic variables from 2012 to 2021, the research has uncovered significant insights that have implications for financial institutions and policymakers.

The study examined both bank-specific and macroeconomic factors. Bank-specific factors included the loan-to-deposit ratio, capital adequacy ratio (CAR), and bank size. The CAR was found to have an insignificant positive effect on NPLs, suggesting that sufficient capital can help banks manage potential loan losses effectively. On the other hand, the study emphasizes the influence of other key factors, such as the loan-to-deposit ratio, bank size, unemployment rate, and gross domestic product (GDP), on NPLs. The importance of prudent lending practices becomes evident as a higher loan-to-deposit ratio increases the vulnerability of the loan portfolio. The study underscores the need for banks to adopt measured lending policies, especially during economic downturns, to mitigate risks associated with adverse macroeconomic indicators such as GDP contraction and rising unemployment rates. The inflation rate was found to have an insignificant negative effect on NPLs, implying that inflation might not significantly impact NPLs in Malaysian commercial banks. Furthermore, the study underscores the symbiotic relationship between financial and economic health. A well-formulated economic policy that fosters GDP growth can contribute to reduced NPL levels through enhanced employment opportunities and increased consumer confidence. Recommendations include bolstering the business environment and supporting high-productivity industries to stimulate economic expansion. Likewise, initiatives to improve youth employability through skills development and apprenticeship programs can tackle unemployment, thus positively impacting credit quality.

As NPLs act as a crucial barometer of a country's banking system and economic vitality, the outcomes of this study provide a roadmap for banks and policymakers alike. The insights gained from analyzing the intricate interplay between bank-specific and macroeconomic variables can inform the crafting of targeted strategies to manage NPL risks, fortify financial stability, and drive sustainable economic growth. In conclusion, the study contributes insights into the complex relationships between bank-specific and macroeconomic factors and their influence on NPLs in Malaysian commercial banks. Its findings guide policy decisions and strategies to enhance the banking sector's stability and the overall economy's health.

Acknowledgments

We thank all the members for their assistance in ensuring that this research is completed and for the final content of the manuscript. We would also like to express our heartfelt gratitude to the Faculty of Accountancy, Universiti Teknologi MARA (UiTM), Puncak Alam, Malaysia, for the financial support to publish this article.

References

Abebe, D. (2021). *Determinants Of Non-Performing Loans in Ethiopian Commercial Banks* (Doctoral dissertation, St. Mary's University).

Alexandri, M. B., & Santoso, T. I. (2015). Non-performing loan: Impact of internal and external factor (Evidence in Indonesia). *International Journal of Humanities and Social Science Invention, 4*(1), 87-91. www.ijhssi.org

Alshebmi, A. S., Mohammad Adam, M. H., Mustafa, A. M. A., Thomran, M., & Fathelbab, O. E. A. (2020). Assessing the non-performing loans and their effect on banks profitability: Empirical evidence from the Saudi Arabia banking sector. *International Journal of Innovation, Creativity and Change, 11*(8), 69-93.

Bhattarai, B. P. (2018). Assessing banks internal and macroeconomic factors as determinants of non-performing loans: evidence from Nepalese commercial banks. *International Journal of Accounting & Finance Review, 3*(1), 13-32. https://doi.org/10.46281/ijafr.v3i1.28

Budiarto, A. (2021). The impact of non-performing loans towards the financial performance of BPR in Central Java, the role of empathy credit risk. *Proceedings of the 4th International Conference on Sustainable Innovation 2020-Accounting and Management (ICoSIAMS, 2020), 176(ICoSIAMS, 2020),* pp. 251-258. https://doi.org/10.2991/aer.k.210121.035

Curak, M., Pepur, S., & Poposki, K. (2013). Determinants of non-performing loans–evidence from Southeastern European banking systems. *Banks and Bank Systems, 8*(1), 45-53.

Dao, B. (2020). Empirical analysis on non-performing loans of listed banks in Vietnam. *European Journal of Business and Management, 12*(6).

Dejene, W. (2020). *Factors affecting non-performing loans in Ethiopian banking sector: specific case of commercial bank of Ethiopia*. http://197.156.93.91/handle/123456789/5701

Gambo, E.-M. J., Abdul-Rahman, A., & Ibrahim, M. (2017). Determinants of non-performing loans in Nigerias deposit money banks. *Archives of Business Research, 5*(1). https://doi.org/10.14738/abr.51.2368

Gezu, G. (2014). Determinants of non-performing loans: empirical study in case of commercial banks in Ethiopia. *Journal of Business Studies Quarterly, 1*(2), 74-79.

Hirnissa, M. T., Zariyawati, M. A., & Fadilla, R. (2020). Exploratory study on determinants of problem loan among non-bank financial institutions in Malaysia. *Advanced Journal of Accounting and Finance, 2*(1), 1-9. https://myjms.mohe.gov.my/index.php/ajaf/article/view/9701

Hosen, M., Yaw Broni, M., & Nazim Uddin, M. (2020). What are the bank specific and macroeconomic elements influence non-performing loans in Bangladesh? Evidence from conventional and Islamic banks. *Green Finance, 2*(2), 212-226. https://doi.org/10.3934/GF.2020012

Islam, T. U. (2020). Determinants of non-performing loans in Pakistan. *Preprints, July*. https://doi.org/10.20944/preprints202007.0682.v1

Karadima, M., & Louri, H. (2021). Economic policy uncertainty and non-performing loans: The moderating role of bank concentration. *Finance Research Letters, 38*, 101458. https://doi.org/10.1016/j.frl.2020.101458

Kartikasary, M., Marsintauli, F., Serlawati, E., & Laurens, S. (2020). Factors affecting the non-performing loans in Indonesia. *Accounting, 6*(2), 97-106. https://doi.org/10.5267/j.ac.2019.12.003

Kepli, S., Bani, Y., Rosland, A., & Laila, N. (2021). Non-performing loans and macroeconomic variables in Malaysia: Recent Evidence. *International Journal of Economics and Management, 15*(1).

Khan, M. A., Siddique, A., & Sarwar, Z. (2020). Determinants of non-performing loans in the banking sector in developing state. *Asian Journal of Accounting Research, 5*(1), 135-145. https://doi.org/10.1108/AJAR-10-2019-0080

Khanal, H. L. (2021). *Capital Adequcay and its Impact on Profitability of Commercial Banks in Nepal* (Doctoral dissertation, Department of Management).

Koju, L., Koju, R., & Wang, S. (2018). Macroeconomic and bank-specific determinants of non-performing loans: evidence from Nepalese banking system. *Journal of Central Banking Theory and Practice, 7*(3), 111-138. https://doi.org/10.2478/jcbtp-2018-0026

Loh, C. Y., Chai, Y. S., Chong, S. Y., Lee, B. S., & Tan, S. Y. (2015). *Macroeconomic variables on banks'*

non-performing loans in Malaysia (Doctoral dissertation, UTAR).

Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panoeconomicus, 61*(2), 193-206. https://doi.org/10.2298/PAN1402193M

Martiningtiyas, C. R., & Nitinegeri, D. T. (2020). *The effect of non-performing loans on profitability in banking sector in Indonesia, 151*(Icmae), 64-67. https://doi.org/10.2991/aebmr.k.200915.016

Mazreku, I., Morina, F., Misiri, V., Spiteri, J. V., & Grima, S. (2018). Determinants of the level of non-performing loans in commercial banks of transition countries. *European Research Studies Journal, 21*(3), 3-13. https://doi.org/10.35808/ersj/1040

Messai, A. S., & Jouini, F. (2013). Micro and macro determinants of non-performing loans. *International Journal of Economics and Financial Issues, 3*(4), 852-860.

Mohamed, S., Abd Hamid, M. A., Hosin, H., & Md Isa, M. A. (2021). Non-performing loans issues in Malaysian banking industry. *International Journal of Academic Research in Business and Social Sciences, 11*(3), 877-891. https://doi.org/10.6007/IJARBSS/v11-i3/8784

Mohamad Zain, E. N., Ghazali, P. L., & Wan Daud, W. M. N. (2020). Determinants of non-performing loans: Evidence from conventional banks in Malaysia. *Humanities & Social Sciences Reviews, 8*(2), 423-430. https://doi.org/10.18510/hssr.2020.8248

Nathan, S., Ibrahim, M., & Tom, M. (2020). Determinants of non-performing loans in Uganda's commercial banking sector. *African Journal of Economic Review, 8*(1), 26-47.

Nargis, N., Ahmad, N. B., Ibrahim, N. B., & Kefeli, Z. B. (2019). Link between non-performing loans (NPL) and economic growth-evidence from an emerging economy. *The Business and Management Review, 10*(5), 88-93. https://cberuk.com/cdn/conference_proceedings/2020-01-05-09-28-03-AM.pdf

Thanh, T., Dao, B., Thu, T., Phan, H., & District, T. X. (2020). Empirical analysis on non-performing loans of listed banks in Vietnam. *European Journal of Business and Management, 12*(6), 18-30. https://doi.org/10.7176/EJBM/12-6-03

Trung, N. K. Q. (2019). Determinants of Non-performing loan in commercial banks: Evidence in Vietnam. *Journal of Science and Technology-IUH, 37*(01). https://doi.org/10.46242/jst-iuh.v37i01.311

Umar, M., & Sun, G. (2018). Determinants of non-performing loans in Chinese banks. *Journal of Asia Business Studies, 12*(3), 273-289. https://doi.org/10.1108/JABS-01-2016-0005

Vaicondam, Y., Hishan, S. S., & Shan, T. P. (2019). The study on factors that influence banks' non-performing loans in Malaysia. *International Journal of Engineering and Advanced Technology, 8*(5), 1289-1297. https://doi.org/10.35940/ijeat.E1183.0585C19

Wood, A., & Skinner, N. (2018). Determinants of non-performing loans: evidence from commercial banks in Barbados. *The Business and Management Review, 9*(3), 44-64.

Yulianti, E., Aliamin, A., & Ibrahim, R. (2018). The effect of capital adequacy and bank size on non-performing loans in Indonesian public banks. *Journal of Accounting Research, Organization and Economics, 1*(2), 205-214. https://doi.org/10.24815/jaroe.v1i2.11709

Zeleke, M. (2018). *Factors affecting non-performing loans in the case of the development bank of Ethiopia, 68*. https://www.grin.com/document/515299