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# MACROECONOMIC DETERMINANTS OF NON-PERFORMING LOANS IN MALAYSIA

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**ABSTRACT**

*This study examines the interplay between macroeconomic factors and Non-Performing Loans (NPLs) within the residential property sector, particularly focusing on commercial and Islamic banks in Malaysia from 2007 to 2021. NPLs, defined as loans overdue for more than 90 days, serve as an indicator of financial health and stability within the banking sector, which, in turn, impacts economic sustainability and environmental investment capacities. Utilizing the autoregressive distributed lag co-integration approach, this research identifies a significant co-integrating relationship between NPLs for residential property and various macroeconomic determinants. The findings underscore that robust economic growth, coupled with reduced lending and unemployment rates, plays a pivotal role in mitigating the risks associated with NPLs, thereby fostering a more resilient and sustainable economic framework. The study contribute an insights that highlight the critical need for stable macroeconomic environments not only to curb NPLs in Malaysia's banking systems but also to enhance the overall sustainability of the financial sector. For long-term financial stability, banks are better positioned to finance sustainable development projects, thereby contributing to a more sustainable and resilient economic future.*

**Keywords**: Non-performing loans, residential property, macroeconomic determinants, Malaysia

## 1.0 INTRODUCTION

Governments and regulatory bodies often monitor and take measures to address the issue of non-performing loans. They could enact policies to help borrowers who are having trouble making their payments, stimulate the economy, or encourage financial institutions to collaborate with borrowers to find solutions to their problems. To maintain the stability of the nation's financial sector and the economy, the Bank Negara Malaysia (BNM) and other pertinent authorities play a role in monitoring and managing non-performing loans (NPLs).

The issue of non-performing loans is frequently cited as one of the potential risks that may cause economic and financial instability in Malaysia. During the crises that occurred in Asia in the 1990s, non-performing loans caused some banks to fail and go bankrupt (Murthy et al., 2017).

Businesses and individuals may find it difficult to generate sufficient income to meet their debt obligations and end up defaulting on their loans when the economy is in a difficult period. During this time, many analysts and economists have asserted that the choices and policies that banks have implemented to eliminate the issue of non- performing loans have,

paradoxically, significantly contributed to the significant burden that banks are under (The Star, 2020).

Non-performing loans are defined as “the outstanding amount of loans (principal and interest) classified as non-performing when principal or interest is six months or more in arrears. Interest on these loans is subsequently suspended” (Bank Negara Malaysia, 2023, p.9).

Macroeconomic conditions and bank-specific factors, such as, rapid credit growth and excessive bank lending are the primary causes of NPLs (Lee & Rosenkranz, 2020). More importantly, higher NPL ratios are frequently connected to weaker economic growth, sharp currency depreciation, and increased volatility in the world financial market, while lower NPL ratios are associated with faster growth and lower global financial market volatility (Park et al., 2021).

Numerous studies have demonstrated that economic growth or output is conducive to rising revenues and declining financial distress. Consequently, economic indicators such as real GDP or GNI growth demonstrate an inverse correlation with non-performing loans (NPLs) (Tham & Mohd Adnan, 2021). Interest rates, which are a type of macroeconomic factor, also have an impact on the level of non-performing loans, particularly in the case of fluctuating interest rates. Therefore, the impact of interest rates is expected to be favourable, meaning that an increase in debt resulting from higher interest payments will lead to a rise in non-performing loans (Erdogdu, 2019; Mehmood, 2023; Dash, 2021).

There is a positive correlation between unemployment and non-performing loans (Tham & Mohd Adnan, 2021). Prior research has demonstrated that a rise in the unemployment rate restricts the current and future ability of households to purchase goods and services and is typically linked to a decline in the production of goods and services (Mazreku et al, 2018; Wan et al., 2023). Elevated levels of unemployment would result in the incapacity of borrowers to reimburse their loans or debts. Unemployment is a major factor contributing to non- performing loans. When individuals receiving job seekers allowance become unemployed, their disposable income decreases, making it difficult for them to manage mortgage repayments (Wan et al., 2023).

Non-performing loans for residential properties are influenced by a complex interplay of economic factors. Research studies have consistently shown that there is a relationship between economic growth, interest rates, and unemployment rates with non-performing loans. Economic growth, as indicated by the gross domestic product (GDP) growth rate, has been found to have a significant negative relationship with non-performing loans. Higher economic growth tends to lead to a reduction in non-performing loans, reflecting a healthier economy (Rathnayake & Dissanayake, 2022). Conversely, lower economic growth is associated with higher non-performing loans. The performance of a country's GDP will directly influence the purchasing power of the public to buy and pay for the property.

Interest rates also play a crucial role in affecting non-performing loans. Studies have shown that there is a positive relationship between interest rates and non-performing loans. Higher interest rates can lead to an increase in non-performing loans for residential properties (Tomi et al., 2020). Additionally, growth in interest rates on residential mortgage loans has been inversely related to the demand for such loans (Dajčman, 2020).

Unemployment rates have been identified as another significant factor influencing non-performing loans. Research indicates that unemployment has a positive impact on the rise of non-performing loans (Kjosevski et al., 2019). Higher unemployment rates are associated with an increase in non-performing loans for residential properties (Qwader, 2019).

Thus, the relationship between economic growth, interest rates, and unemployment rates is crucial in understanding the dynamics of non-performing loans for residential properties. Higher economic growth and lower interest rates tend to lead to a decrease in non-performing loans, while higher unemployment rates are associated with an increase in non-performing loans. Policymakers and financial institutions need to consider these factors carefully to manage and mitigate the risks associated with non-performing loans in the residential property sector.

Non-performing loans have a significant impact on financial sustainability. Research has shown that non-performing loans negatively affect the financial performance of banks (Maharjan, 2023). When the level of non-performing loans increases, it can lead to a decrease in profitability and financial stability (Ntoiti&Jagongo, 2021). This negative relationship between non-performing loans and financial sustainability is crucial for banks and financial institutions to manage effectively.

Furthermore, non-performing loans can also impact the financial sustainability ratio of institutions. Studies have indicated that non-performing loans have a significant negative effect on the financial sustainability ratio (Saputra & Mayangsari, 2022). This highlights the importance of minimizing non-performing loans to maintain a healthy financial position.

In addition, the relationship between non-performing loans and financial sustainability is influenced by factors such as financial inclusion and economic conditions. Countries with high levels of financial inclusion tend to experience lower levels of non-performing loans, contributing to better financial sustainability (Ozili & Adamu, 2021). Moreover, during economic downturns or crises, the level of non-performing loans tends to increase, posing challenges to financial sustainability (Kaya, 2022).

Overall, non-performing loans play a critical role in determining the financial health and sustainability of banks and financial institutions. Managing and reducing non-performing loans is essential for ensuring long-term financial stability and performance.
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As of 2021, the average non-performing loans to total bank loans of 113 countries of the world was 6.05%, according to recent statistics (TheGlobalEconomy.com, 2023). Looking at individual countries, South Korea and Micronesia have the lowest NPL ratios of 0.3 or lower in the world as of 2021, while San Marino, Equatorial Guinea, and Ukraine have the highest NPL ratios at 58.96%, 55.08%, and 31.72%, respectively. The statistics also reveal that the NPL ratio in Malaysia stood at 1.68% during the same period. On average, Malaysia's NPL ratio is lower than the world's NPL ratio; however, the level of NPLs has unfortunately been increasing over the years. Using monthly average data as shown in Figure 1(a), Malaysian banks' total NPLs have hit a nine-year high of RM29.7 billion in 2021. A closer look into the breakdown of NPLs shows that working capital and residential property purchases make up a larger share of the total NPLs in Malaysia's banking system.

Figure 1(b) presents the NPLs for purchases of residential property in Malaysia from 2013 to 2021. Residential property-related NPLs have been on the rise over the last few years. For instance, the NPLs for purchases of residential property involving both commercial and Islamic banks reached RM6.2 billion and RM2.5 billion, respectively, in September 2021. This indicates a significant rise from the preceding figure of RM4.0 billion (commercial banks) and RM1.8 billion (Islamic banks) for the same period in 2020. Nevertheless, the current high levels of non-performing property loans for purchases of residential property are partially the result of a sluggish global economy, along with weak

economic growth, rising inflation and interest rates, war, and pandemic aftershocks. Given the above background, the primary objective of this study is to examine the macroeconomic determinants affecting the NPLs for purchases of residential property of commercial and Islamic banks in Malaysia between 2007 and 2021.

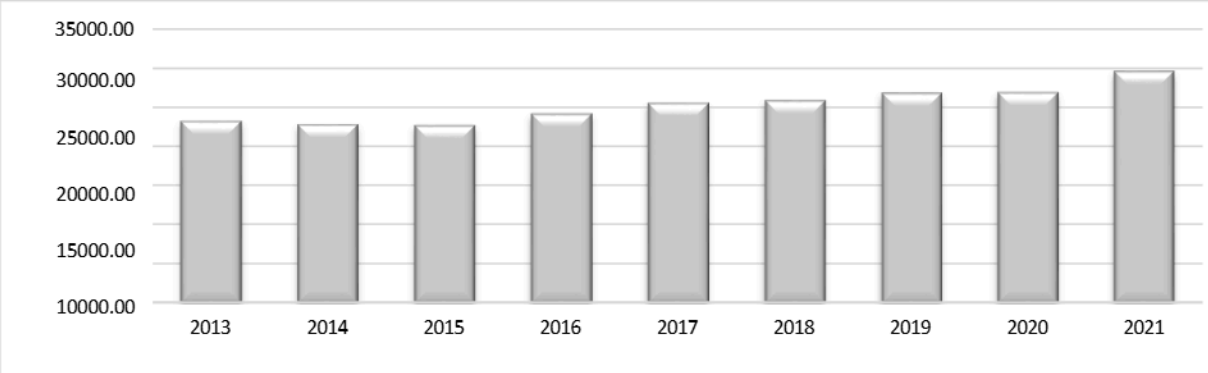


***Fig. 1:*** *Total Non-Performing Loans in Malaysia's Banking System (Monthly average)*

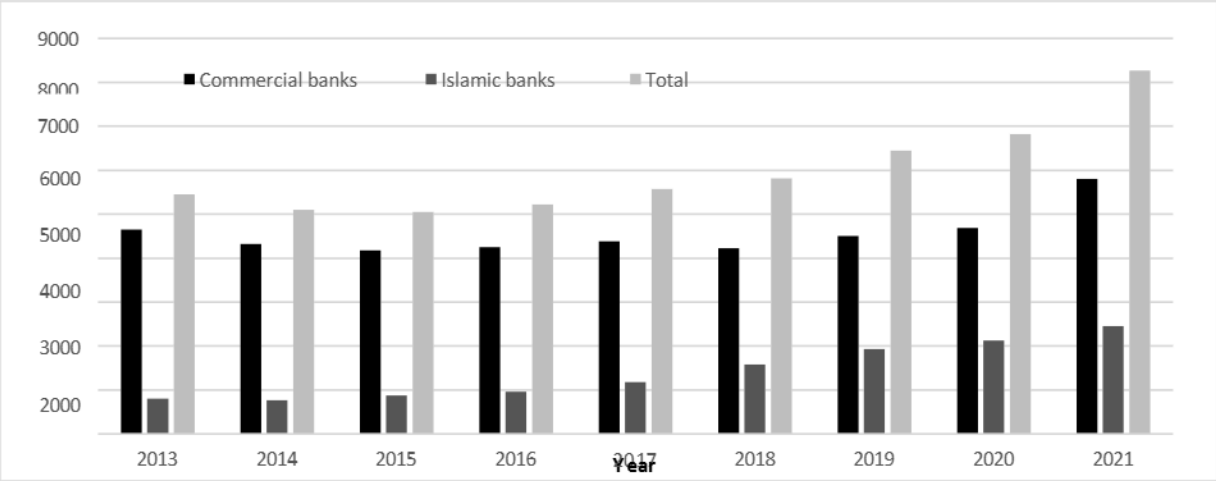


***Fig. 2:*** *Non-Performing Loans for Purchases of Residential Property in Malaysia (Monthly average)*

## 2.0 LITERATURE REVIEW

The study by Ahiase et al. (2023) encompassed 53 African nations, exploring the relationship between non-performing loans (NPLs) and macroeconomic factors, including GDP, gross external debt, unemployment, inflation, interest rates, and government effectiveness. While the research highlighted the influence of macroeconomic factors and governance on NPLs, it did not consider macroeconomic shocks. This perspective finds resonance in Osunkoya et al. (2023) work, focusing on Nigeria's data from 1981 to 2019, where a positive relationship between macroeconomic indicators and NPLs was established.

Similar trends are evident across diverse regions. Gashi et al. (2022) studied Western Balkan countries, finding comparable results. Golitsis et al. (2022) examined North Macedonia, Foglia (2022) analyzed Italy, and Tham et al. (2021) along with Kepli et al. (2021) delved into Malaysia. Kjosevski and Petkovski (2020) expanded their analysis to the Baltic States. Staehr and Uusküla (2019) scrutinized EU countries, yielding valuable insights

into the connection between macroeconomic indicators and NPLs. Moreover, inflation's interplay with NPLs, Osunkoya et al. (2023) emphasized minor short-term effects within Nigeria. This stance aligns with Küçük (2022) and Özen et al. (2022) studying Turkey, while Tham et al. (2021) and Kepli et al. (2021) explored Malaysia. In contrast, Kjosevski and Petkovski (2020) offered divergent insights. Inflation's implications on NPLs span positive and negative dimensions. Tham et al. (2021) introduced the housing price index, suggesting a positive correlation between rising property values, exhibiting a substantial short-term connection. Despite its significance, the impact of housing prices on real estate non-performing loans (NPLs) is relatively limited within the ECM model. This parallels Ahiase et al. (2023) findings, indicating higher inflation rates correlate with increased NPLs. Conversely, Gashi et al. (2022) proposed an inverse relationship, where heightened inflation might reduce NPLs.

In the context of GDP, Staehr and Uusküla (2019) highlighted GDP as a key determinant of NPLs. Osunkoya et al. (2023) confirmed short-term GDP effects on Nigerian NPLs, with stronger long-term impact. This aligns with Tham et al. (2021) perspective, contrasting Foglia's (2022) finding of a negative GDP-NPL relationship. For the case of unemployment, its short- term impact on Nigerian NPLs is acknowledged by Osunkoya et al. (2023), though insignificance emerges in the long term. Conversely, Golitsis et al. (2022) emphasized unemployment's substantial role in North Macedonia's NPL dynamics, complementing Ahiase et al. (2023)'s focus on NPLs and credit risk dynamics. Foglia (2022) uncovered a positive correlation between unemployment rates and impaired loans.

In other cases, interest rates and NPLs are positively linked, as identified by Ahiase et al. (2023). Osunkoya et al. (2023) supported this notion, observing a favourable impact of lending rates on NPLs. Golitsis et al. (2022) highlighted interest rates' robust long-term influence on NPLs. Tham et al. (2021) concurred, reporting extended causal effects and elasticity between interest rates and NPLs.

Conversely, Ahmed et al. (2021) revealed that exchange rates constitute an external determinant alongside GDP, inflation, and government regulation. Osunkoya et al. (2023) noted exchange rates' short-term effect on Nigerian NPLs, evolving into a positive, significant influence over the long term. In a study on Romanian banks, Hada et al. (2020) highlighted exchange rates and unemployment as key determinants of non-performing loans (NPLs). Kepli et al. (2021) emphasized economic growth, money supply, and exchange rates for managing NPLs amidst volatile capital flows, stressing exchange rate flexibility and sufficient money supply's role in withstanding external shocks.

This research aims to address the existing research gap by examining the associations among GDP, interest rates, lending rates, unemployment rates, property prices/inflation, central bank policy rates, and exchange rates pertaining to residential properties in Malaysia from 2007 to 2021. The investigation encompasses most of the macroeconomic factors that could potentially impact property NPLs among individuals in Malaysia. Given the limited body of literature concerning Malaysia (as highlighted by Kepli et al., 2021), this study bridges this gap by exploring various determinants, particularly concentrating on property loans, an area that has received relatively less attention. Furthermore, the significant role of property NPLs in numerous countries, as emphasized by Tham et al. (2021), motivated the exploration of this subject.

## 3.0 DATA AND METHODOLOGY

### 3.1 Data

The data used in this study are the quarterly data covering the period 2007Q1-2020Q2. The dependent variable included is the NPL for purchases of residential property to

total NPLs of commercial and Islamic banks. The non-performing residential property loans data are obtained from the Bank Negara Malaysia's Monthly Highlights and Statistics in June 2013. On the other hand, the chosen macroeconomic variables are GDP growth rate (GDPG), lending rate (LEND), unemployment rate (U), and the growth rate of real residential property prices (PP). Data on these variables are retrieved from the International Financial Statistics (IFS), the Bank Negara Malaysia's Monthly Highlights and Statistics, and the Bank for International Settlements.

### 3.2 Methodology

This study applies the Autoregressive Distributed Lag (ARDL) approach (Pesaran et al., 2001) to examine the long-run relationship between NPLs and their determinants. The ARDL approach is particularly useful when it is uncertain whether the underlying regressors are trend- or first-difference stationary. It involves testing the existence of a level relationship between a dependent variable and a set of regressors. The standard F-test is used to test the significance of the lagged levels of the variables in a univariate equilibrium correction mechanism. The asymptotic distributions of these statistics are non-standard under the null hypothesis that there is no level relationship, regardless of whether the regressors are I (0) or I (1).

One advantage of the ARDL approach is that it provides bound testing procedures. Two sets of asymptotic critical values are provided: one when all regressors are purely I (1) and the other when they are all purely I (0). These critical values cover all classifications of the regressors into purely I (0), purely I (1), or a combination of both (Ali et al., 2017). The ARDL approach is a suitable method for analysing the impact of macroeconomic factors on non-performing property loans. Following previous empirical studies (Foglia, 2022; Golitsis et al., 2022; Park et al., 2021), the long-run model can be written in the following form:

$$LOANt = \beta 0 + \beta 1YGt + \beta 2LENDt + \beta 3UNEMt + \beta 4PRICEt + et \qquad \text{(Eq. 1)}$$

where LOAN is the NPLs for purchases of residential property to total NPLs ratio. YG is the GDP growth, LEND is the lending rate, UNEM is the unemployment rate, and PRICE is the real residential property price growth. β1…, β4 represent the coefficients of the independent variables and e is the error term.
Specifically, GDP growth is expected to have a negative impact on NPLs. As GDP increases, per capita income will also increase, thus consumers may have no problem paying the monthly instalment. The lending rate may positively affect NPLs. As the cost of borrowing increases, consumers may find it difficult to pay their loan instalments. For residential property prices, the study believes that as the price is higher, there will be a higher tendency for NPLs. The expected signs are shown in Table 1.

There are several steps that need to be taken before conducting the ARDL test. The first step involves lag length selection using information criteria. The lag lengths can be guided by using Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and Hannan and Quinn information criterion (HQIC). This study uses AIC for the optimal lag orders. As ARDL allows the selection of appropriate lag, the endogeneity problem will be eliminated, thus it is free from residual correlation (Ali et al., 2017).

The second step is the unit root test. ARDL allows the variables to be stationary at level I (0) or at first difference I (1), but not at second difference I (2). The existence of I (2) variables in the model will cause the computed F-statistics to be invalid. Subsequently, the Augmented Dickey-Fuller (ADF) test is used to check whether variables in the model are free from I (2).

The third step involves the ARDL estimation after all variables are stationary at I (0) or I (1). In this study, the following equations can be formed:

$$\Delta LOAN_t = \alpha_0 + \alpha_1 YG_{t-1} + \alpha_2 LEND_{t-1} + \alpha_3 UNEM_{t-1} + \alpha_4 PRICE_{t-1} + \sum_{i=1} \tau_i \Delta LOAN_{t-i} + \sum_{i=0}^{p} \delta_{1i} YG_{t-i} + \sum_{i=0}^{p} \delta_{2i} \Delta LEND_{t-i} + \sum_{i=0}^{p} \delta_{3i} \Delta UNEM_{t-i} + \sum_{i=0}^{p} \delta_{4i} \Delta PRICE_{t-i} + \varepsilon_t \quad \text{(Eq. 2)}$$

where Δ is the first difference operator, α0 is the drift component, and Ɛ is the white noise residuals.

The first part of Equation (2) (without the summation sign) signifies the long-run relation, while the second part of the equation explains the short-run dynamics. The existence of a long-run relationship can be tested by using F-statistics with a null hypothesis of no cointegration. The F-statistic value can be compared to the critical values consisting of I (0) for a variable assumed to be stationary at level and I (1) for a non-stationary variable. Critical values tabulated by Narayan (2005) are applicable to small sample sizes. The null hypothesis is rejected if the calculated F-statistic value is greater than the upper bound of the critical values. This implies that there exists a long-run relationship between NPLs and its determinants.

## 4.0 RESULTS AND DISCUSSIONS

Table 1 depicts the summary statistics and correlation coefficients for the key variables. In Panel (a) of this table, the non-performing loans for purchases of residential property as a percentage of the total non-performing loans stood at Malaysia Commercial and Islamic banks at 25.6%. The quarterly GDP growth averaged 4.2%, ranging from the lowest growth rate of -17.2% to the highest growth rate of 16.1%. Lending rates in Malaysia were recorded at 4.9% between 2007 and 2021. The lending rate reached an all-time high of 6.6% and the lowest recorded lending rate was 3.4% over the study period. Malaysia's unemployment rate and real residential property price index growth for 2007-2021 were at approximately 3.4% and 4.1%, respectively. While Panel (b) in this table lists the correlation coefficients among the regressors during the sample period. The correlations between two independent variables are low, suggesting that there is no serious multicollinearity in this study.

Table 2 presents the results from augmented Dickey–Fuller (ADF) test for the stationarity of the variables. The null hypothesis of a unit root can be rejected at first differences, showing that all the variables can be characterized as I (1). Subsequently, the ARDL bound test is used to examine the cointegrating relationships between the variables.

Table 1: Summary Statistics

**a) Summary Statistics**

| | Mean | Maximum | Minimum | Std. | Obs |
|---|---|---|---|---|---|
| **LOAN** | 25.606 | 33.1747 | 21.5611 | 3.1793 | 58 |
| **YG** | 4.2445 | 16.1375 | -17.2195 | 4.3906 | 58 |
| **LEND** | 4.8754 | 6.55 | 3.4492 | 0.6739 | 58 |
| **UNEM** | 3.3904 | 5.1 | 2.7 | 0.504 | 58 |
| **PRICE** | 4.0674 | 12.8291 | -3.2588 | 3.6288 | 58 |

**b) Correlation Matrix**

| | LOAN | YG | LEND | UNEM | PRICE |
|---|---|---|---|---|---|
| **LOAN** | 1.0000 | | | | |
| **YG** | -0.1986 | 1.0000 | | | |
| **LEND** | 0.5395 | 0.1873 | 1.0000 | | |
| **UNEM** | 0.2262 | -0.4813 | -0.4258 | 1.0000 | |
| **PRICE** | -0.4114 | 0.1344 | -0.2070 | -0.4540 | 1.0000 |

Table2: Augmented Dickey-Fuller Test Results

| | Level | | First Differences | | | |
|---|---|---|---|---|---|---|
| | Constant | Constant, Trend | Constant | | Constant, Trend | |
| | t-Stat | t-Stat | t-Stat | | t-Stat | |
| **LOAN** | -1.5378 | -0.9517 | -7.5617 | *** | -3.5889 | ** |
| **YG** | -2.4791 | -2.5254 | -6.3064 | *** | -6.1438 | *** |
| **LEND** | -1.777 | -2.4654 | -4.4082 | *** | -4.3754 | *** |
| **UNEM** | -1.307 | -1.9177 | -8.2917 | *** | -8.366 | *** |
| **PRICE** | -1.3763 | -1.4555 | -7.2617 | *** | -4.5511 | *** |

Notes: ***, and ** denote statistical significance at the 1% and5% levels, respectively. The optimal lag length is selected using the Akaike Information Criteria

The result for the ARDL cointegration bound test is presented in Table 3. The calculated F-statistic (8.1382) exceeds the upper bound critical values at the 1% level of significance, concluding that there exists a cointegrating relationship between the variables examined in this study.

Furthermore, the long-run relationship between NPLs and its macroeconomic factors can be viewed in Panel (a) of Table 4. The study finds that three out of four explanatory variables are statistically significant at the 1% level. All the long-run parameter estimates have the expected signs. For GDP growth rate, a one percentage point increase in GDP growth leads non-performing residential property loans to drop by about 0.57 percentage point of total NPLs. Conversely, the estimated coefficients for lending rate and unemployment rate are positive. This suggests that lower unemployment and lending rates are associated with a decrease in the NPL for purchases of residential property of commercial and Islamic banks in Malaysia. Overall, favourable macroeconomic conditions can cause the business and household sectors to benefit from higher income, which could reduce the risk of loan default, reduce credit risk, and result in a lower size of NPLs.

Panel (b) of Table 4 presents the results for error correction regression. Interestingly, the error correction terms (ECT) are negative and statistically significant at the 1 percent level. This indicates that about 42% of the discrepancy between the long-run and short-run is corrected within a quarter. Thus, the adjustment is faster for the NPLs in residential property. This scenario could be reasonable where the investment in residential property usually takes a shorter time as the value of the properties is higher. Lastly, for diagnostic tests, the model passes the assumptions of normality, serial correlation, heteroskedasticity, and specification bias, thus the models are overall fit.

Table 3: ARDL Bounds Cointegration Test Results

| | K | F-statistic |
|---|---|---|
| **LOAN=f (YG, LEND, UNEM, PRICE)** | 4 | 8.1382*** |
| **Significance** | **I (0)** | **I (1)** |
| 10% | 2.3450 | 3.2800 |
| 5% | 2.7630 | 3.8130 |
| 1% | 3.7380 | 4.9470 |

Notes: *** denotes statistical significance at the 1% level. Critical value bounds are based on Narayan (2005). The lag selection is selected using Akaike Information Criterion.

Table 4: Long-Run Estimates and Error Correction Regression

| a) Long-run Estimates: ARDL (1, 2, 1, 3, 0) | | | |
|---|---|---|---|
| **Variable** | **Coefficient** | **t-Statistic** | |
| **constant** | -6.2617 | -0.9731 | |
| **YG** | -0.5694 | -3.9902 | *** |
| **LEND** | 4.6228 | 7.2772 | *** |
| **UNEM** | 3.3533 | 2.7353 | *** |
| **PRICE** | 0.0616 | 0.5947 | |
| **Error Correction Regression** | | | |
| **Variable** | **Coefficient** | **t-Statistic** | |
| **D(YG)** | -0.0742 | -2.4999 | ** |
| **D (YG (-1))** | 0.2086 | 4.4531 | *** |
| **D(LEND)** | -2.8951 | -3.2589 | *** |
| **D(UNEM)** | -1.0360 | -2.2043 | ** |
| **D (UNEM (-1))** | -2.2664 | -4.1930 | *** |
| **D (UNEM (-2))** | -2.1109 | -4.4653 | *** |
| **ECM (-1)** | -0.4165 | -7.3829 | *** |
| Adjusted R2 | 0.5665 | | |
| SER | 0.7142 | | |
| AIC | 2.2832 | | |
| SC | 2.5387 | | |
| **Diagnostic tests** | **Statistic** | **Prob.** | |
| **BGLM** | 0.7361 | 0.6921 | |
| **ARCH** | 1.2204 | 0.5432 | |
| **RESET** | 0.0253 | 0.9750 | |
| **JARQUE-BERA** | 2.0772 | 0.3539 | |

Notes: *** and ** denote statistical significance at the 1% and 5%levels, respectively. BGLM-Breusch-Godfrey serial correlation LM test, ARCH-Autoregressive conditional heteroskedasticity test, RESET-Ramsey RESET test, SER-S.E. of regression. AIC-Akaike info criterion, and SC-Schwarz criterion.

## 5.0 CONCLUSION

Among the key factors in determining credit risk are non-performing loans, where the greater the credit risk, the higher the probability of default (Foglia, 2022). Frequently, bank disruption is caused by a high amount of NPLs (Jolevski, 2017). Malaysia's economy continued to maintain positive performance, with GDP growing at a pace of 3.3% in 2021 and 8.7% in 2022 (Bank Negara Malaysia, 2023). Nevertheless, the Malaysian banking system has recorded a significant rise in NPLs over the years. More importantly, the NPLs for purchases of residential property remained high for commercial banks and Islamic banks. A sluggish global economy, weak economic growth, rising interest rates, war, and pandemic aftershocks are frequently cited as the most significant determinants of NPLs. Accordingly, the objective of this study is to explore macroeconomic determinants that may influence the non-performing property loans in Malaysia. Specifically, this study focuses on commercial and Islamic banks in Malaysia from 2007 to 2021.

Using the ARDL approach, the results confirm that there exists a cointegrating relationship between non-performing residential property loans and its determinants. The macroeconomic factors considered in this study are GDP growth, lending rate,

unemployment rate, and real residential property price index growth. First, the results show that the behaviour of NPLs in Malaysia's commercial and Islamic banks is affected by different macroeconomic factors over the study period. Second, it is evident that the decrease in NPLs for residential property is affected by robust economic growth, coupled with reduced lending and unemployment rates. Lastly, these findings highlight the critical need for a stable macroeconomic environment not only to curb NPLs in Malaysia's banking systems but also to enhance the overall sustainability of the financial sector.

An effective macroeconomic surveillance system can closely monitor economic developments, identify the interconnections between different economic variables, and prioritize the stability of housing prices to prevent speculation and minimize the impact of housing prices on non-performing loans.

## 6.0 POLICY IMPLICATION AND RECOMMENDATION

In sum, if macroeconomic stability is to contribute to reducing NPLs, then the banks can take steps to lessen and mitigate the impact of property financing risks through NPL management. This is associated with appropriate lending criteria and credit risk management of property investment. Banks also need to acknowledge and deal with the difficulties associated with long-term financial sustainability while assessing the overall market environment, which encompasses macroeconomic indicators, market mechanisms, and changes in property prices. For long-term financial stability, banks are better positioned to finance sustainable development projects, thereby contributing to a more sustainable and resilient economic future.

For future research, it is advisable to anticipate the non-residential property sector effect towards NPLs. Non-residential property such as small businesses, mercantile buildings, industrial buildings can also become potential factors that cause NPLs. A comparison can also be made between the effect of residential and non-residential property, thus a better policy or regulations can be implemented by Central Bank or commercial banks to reduce NPLs in the future.

## REFERENCES

Ahiase, G., Andriana, D., Agbemava, E., & Adonai, B. (2023). Macroeconomic cyclical indicators and bank non-performing loans: does country governance matter in African countries?. *International Journal of Social Economics*.

Ahmed, S., Majeed, M. E., Thalassinos, E., &Thalassinos, Y. (2021). The impact of bank specific and macroeconomic factors on non-performing loans in the banking sector: evidence from an emerging economy. *Journal of Risk and Financial Management, 14*(5), 217.

Ali, W., Abdullah, A., & Azam, M. (2017). Re-visiting the environmental Kuznets curve hypothesis for Malaysia: Fresh evidence from ARDL bounds testing approach. *Renewable and Sustainable Energy Reviews, 77*, 990–1000. https://doi.org/https://doi.org/10.1016/j.rser.2016.11.236.

Bank Negara Malaysia. (2023). *Monthly Highlights & Statistics in June 202*3. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.bnm.gov.my/documents/20124/11457190/x_en.pdf

Barra, C., & Ruggiero, N. (2023). Bank-specific factors and credit risk: evidence from Italian banks in different local markets. J*ournal of Financial Regulation and Compliance, 31*(3), 316-350.

Dajčman, S. (2020). Demand for residential mortgage loans and house prices in the Euro area. E*conomics & Sociology, 13*(1), 40-51. https://doi.org/10.14254/2071-789x.2020/13-1/3.

Dash, M. K. (2021). The determinants of non- performing assets in Indian commercial. Middle *Eastern Finance and Economics Journal*.

Erdogdu, A. (2019). Assessing the impact of non-performing loans on economic growth in Turkey. *American Research Journal*.

Foglia, M. (2022). Non-performing loans and macroeconomics factors: *The Italian case. In Risks,10*,(1). https://doi.org/10.3390/risks10010021.

Gashi, A., Tafa, S., & Bajrami, R. (2022). The Impact of macroeconomic factors on non-performing loans in the Western Balkans. E*merging Science Journal, 6*(5), 1032-1045.

Golitsis, P., Khudoykulov, K., & Palanov, S. (2022). Determinants of non-performing loans in North Macedonia. C*ogent Business & Management, 9*(1)]. https://doi.org/10.1080/23311975.2022.2140488.

Hada, T., Bărbuță-Mișu, N., Iuga, I. C., & Wainberg, D. (2020). Macroeconomic determinants of nonperforming loans of Romanian banks. *Sustainability, 12*(18), 7533.

Jolevski, L. (2017). Non-performing loans and profitability indicators: The case of the Republic of Macedonia. *Journal of Contemporary Economic and Business Issues, 4*(2), 5–20.

Kaya, H. (2022). The impact of the 2008-2009 global crisis on manufacturing firms' bank accounts, overdraft facilities, and loans. *Financial Markets Institutions and Risks, 6*(3), 64-70. https://doi.org/10.21272/fmir.6(3).64-70.2022.

Kepli, S., Bani, Y., Rosland, A., & Laila, N. (2021). Non-performing loans and macroeconomic variables in Malaysia: Recent evidence. I*nternational Journal of Economics and Management, 15*(1), 19-31.

Kjosevski, J., Petkovski, M., & Naumovska, E. (2019). Bank-specific and macroeconomic determinants of non-performing loans in the Republic of Macedonia: Comparative analysis of enterprise and household NPLs. E*conomic Research-EkonomskaIstraživanja,32(*1),1185-1203. https://doi.org/10.1080/1331677x.2019.1627894.

Kjosevski, J., & Petkovski, M. (2021). Macroeconomic and bank-specific determinants of non-performing loans: The case of Baltic States. *Empirica, 48*(4), 1009-1028.

Küçük, Ş. Y. (2022). Determinants of non-performing consumer loans for Turkey: ARDL bounds testing approach. B*usiness, Management and Economics Engineering, 20*(2), 312-328.

Lee, J., & Rosenkranz, P. (2020). Nonperforming loans in Asia: Determinants and macrofinancial linkages. In *Emerging market finance: new challenges and opportunities* (pp. 33-53). Emerald Publishing Limited.

Maharjan, S. (2023). Effect of working capital management and credit management policy on financial performance of commercial banks in Nepal. *The Lumbini Journal of Business and Economics, 11*(1), 266-284. https://doi.org/10.3126/ljbe.v11i1.54333.

Mehmood, B., Younas, I. Z., & Ahmed, N. (2023). Macroeconomic and bank specific covariates of non-performing loans in Paskitani Commercial Banks. J*ournal of Emerging Economies and Islamic Research, 1*(30).

Murthy, U., Mohammed Kamil, N., Anthony Mariadas, P., & Devi, D. (2017). Factors Influencing non-performing loans in commercial Banks: The case of banks in Selangor. I*nternational Journal of Business and Management, 12(*2), 246. https://doi.org/10.5539/ijbm.v12n2p246

Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics, 37*(17), 1979–1990. https://doi.org/10.1080/00036840500278103

Ntoiti, R. & Jagongo, A. (2021). Non-performing loans and financial stability of deposit taking saccos regulated by SASRA. I*nternational Journal of Finance and Accounting, 6*(2). https://doi.org/10.47604/ijfa.1408.

Osunkoya, M., Ikpefan, O., & Olokoyo, F. (2023). Macroeconomic and Bank-specific determinants of non-performing loans in nigeria. WSEAS *Transactions on Business and Economics, 20*, 1153-1166.

Ozili, P. and Adamu, A. (2021). Does financial inclusion reduce non-performing loans and loan loss provisions? *Journal of Corporate Governance Insurance and Risk Management, 8*(2), 10-24. https://doi.org/10.51410/jcgirm.8.2.2.

Fell, J., Grodzicki, M., Lee, J., Martin, R., Park, C. Y., & Rosenkranz, P. (2021). *Nonperforming Loans in Asia and Europe—causes, impacts, and resolution strategies.* Asian Development Bank..

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. J*ournal of Applied Econometrics, 16*(3), 289–326. https://doi.org/10.1002/jae.616

Qwader, A. (2019). Relationship between macroeconomic variables and their impact on non-performing loans in Jordanian Banks. *Asian Economic and Financial Review, 9*(2), 166-175. https://doi.org/10.18488/journal.aefr.2019.92.166.175.

Rathnayake, R. & Dissanayake, D. (2022). Determinants of non-performing loans: evidencefrom Sri Lanka. *South Asian Journal of Finance, 2*(1), 14-27. https://doi.org/10.4038/sajf.v2i1.39.

Saputra, I. & Mayangsari, S. (2022). *The analysis of financial sustainability ratio on rural banks in Indonesia*. https://doi.org/10.4108/eai.3-8-2021.2315153.

Staehr, K., & Uusküla, L. (2020). Macroeconomic and macro-financial factors as leading indicators of non-performing loans: Evidence from the EU countries. J*ournal of Economic Studies, 48*(3), 720-740.

Tham, K-W., Said, R., & Mohd Adnan, Y. (2022). Dynamic implications of GDP, interest rates,taxes, income, foreign direct investments, housing prices on property NPLs. *International Journal of Housing Markets and Analysis, 15*(5), 1122-1144.

Tham, K.-W., & Mohd Adnan, Y. (2021). Implication of Macroeconomics factors on non-property loans: Case of Malaysia. *International Surveying Research Journal,2*, Session 20/21

TheGlobalEconomy.com. (2023). *Non-performing loans - Countryrankings.* TheGlobalEconomy.Com.https://www.theglobaleconomy.com/rankings/nonperforming_loans/#:~:text=Non-

Tomi, S., Emmanual, I., & Adeyinka, A. (2020). Implications of non-performing loans on the Nigerian deposit money banks. A*sian Finance & Banking Review, 4*(1), 17-23. https://doi.org/10.46281/asfbr.v4i1.556.

Wan, C., Che, N., Amil, M., Haris, B., Akila, N., & Kassim, M. (2023). Determinants of non-performing loans: evidence from Malaysia. I*nformation Management and Business Review,15*(4).