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Factors Influencing Non-Performing Loans in State-Owned Banks' Consumer Loans in Indonesia

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Abstract

This research aims to examine the factors that influence Non-Performing Loan (NPL) consumer credit at state-owned banks in Indonesia. In this study, consumer credit refers to loans granted by banks to consumers, while Non-Performing Loan consumer credit refers to consumer credit that experiences repayment problems. Consumer credit base interest rate, the amount of consumer credit distribution, the consumer price index, the residential property price index, and the debt service ratio act as independent variables, and the Non-Performing Loan consumer credit variable stands as the dependent variable. The data used are annual panel data from the period of 2011–2023, and the analysis uses the panel-data regression method of the common effect model. The results of the study indicate that the consumer credit base interest rate, the consumer price index, the residential property price index, and the debt service ratio do not have a significant effect, while the amount of consumer credit distribution and the residential property price index have a significant effect on Non-Performing Loan consumer credit. This study provides the importance of state-owned banks to maintain the quality of consumer credit portfolios.

Keywords: consumer loans, non-performing loans, internal bank factors, macroeconomic, moral hazard debtors.

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1. INTRODUCTION

Gross Regional Domestic Product (GRDP) reflects the total value of goods and services produced in a region and serves as a key indicator of regional economic performance. Consumer credit significantly contributes to two major components of GRDP: household consumption, which represents households' spending on goods and services, and gross fixed capital formation (GFCF), which reflects investment in fixed assets such as housing and infrastructure. From 2014 to 2023, household consumption contributed an average of 40.20% and GFCF 22.88% to GRDP (Badan

Pusat Statistik, 2024). Non-mortgage consumer credit, used for vehicles, education, and healthcare, supports household consumption, with 89.5% of households relying more on credit than personal funds between 2021 and 2023 (Otoritas Jasa Keuangan , 2023). Meanwhile, mortgage credit supports investment, with 76.25% of residential purchases in Q1 2024 financed through mortgages (Bank Indonesia, 2024). In addition to its contribution, consumer credit is also associated with credit risk; the development of bad loans (non-performing loans) during the study period is presented in Chart 1 to provide an overview of credit quality. As illustrated in Figure 1, consumer credit quality deteriorated, as indicated by a 5.73% increase in consumer loan NPLs over the total observation period.

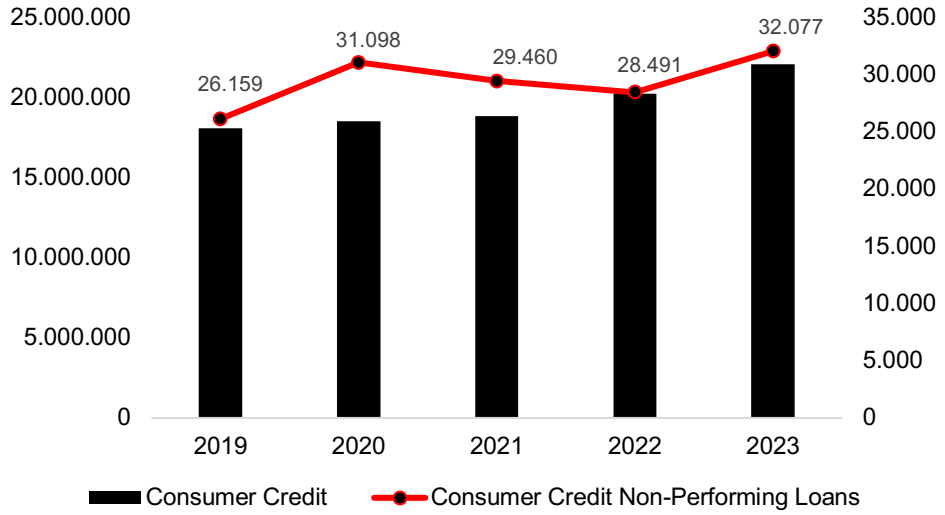

Figure 1. Credit Consumer Non-Performing Loans 2019-2023 (in Billion)

Source: Data processed (2025).

Given this role, the rising trend in consumer Non-Performing Loans (NPLs) as shown in a 20% increase from 2014 to 2023 raises serious concern (Otoritas Jasa Keuangan, 2023). This is the highest among all loan types, compared to a 12% rise in working capital loan NPLs and a 28.63% decline in investment loan NPLs. High consumer NPLs can reduce bank liquidity and limit credit disbursement, driving up lending rates and borrowing costs, which may slow economic growth (Fajar et al., 2015; Putri, 2016; Suyitno & Djawoto, 2017). If left unchecked, it may even trigger fiscal burdens due to potential bailouts (Kemu et al., 2016).

To address this potential problem, banks must manage credit quality by understanding key risk factors. External factors such as inflation and economic downturns can weaken debt repayment capacity (Skarica, 2014; Ghosh, 2015). Internally, poor risk assessment and credit strategies contribute to rising NPLs (DeFusco et al., 2022; Priatna, 2021). Additionally, debtor moral hazard, such as excessive loan during economic booms when credit standards tend to loosen, securing loans beyond repayment capacity based on optimistic income expectations, or poor financial planning that prioritizes consumption over debt obligations, has been empirically linked to higher default rates and remains a concern (Ybrayev et al., 2024). Thus, NPL management is essential for banking stability and credibility.

Managing credit risk is a national priority. Under *Undang-Undang Republik Indonesia Nomor 7 Tahun 1992*, banks are not only profit-driven but must also support the national economic development. State-owned banks (BUMN) have played a central role, disbursing 42.98% of consumer loans from 2014 to 2023, more than private, regional, or foreign banks (Otoritas Jasa Keuangan, 2023). They also offered the lowest average loan rates at 11.33% (Bank Indonesia, 2023) and contribute to state revenues through dividends (Nasution & Prima, 2024).

2. LITERATURE REVIEW

This study is grounded in two overarching theoretical frameworks: the basic function of banking as an intermediary institution and the concept of consumer credit non-performing loans. The intermediation theory of banking explains the fundamental role of banks in channeling funds from surplus economic units to deficit units through credit allocation, thereby supporting economic activity and financial system efficiency. Meanwhile, the concept of consumer credit non-performing loans provides a theoretical basis for understanding credit risk, emphasizing how borrower default reflects the quality of credit intermediation and the effectiveness of banks' risk management practices.

2.1. The Basic Function of Banking as an Intermediary Institution

According to *Undang-Undang Republik Indonesia Nomor 10 Tahun 1998*, banks play an important role as intermediary institutions within the economy. One of their primary functions is to collect funds from the public, such as demand deposits, savings, and time deposits, commonly referred to as third party funds (*dana pihak ketiga*/DPK), which are then redistributed to the public in the form of loans or credits. According to Suhendra & Ronaldo (2017), in carrying out its role as an intermediary, a bank must be prudent in granting loans to sectors or debtors with low-risk profiles. However, in the risk assessment process, banks are not immune to debtor information asymmetry, which can lead to moral hazard practices such as poor capital management, opportunistic behavior, and inappropriate lending decisions (DeFusco et al., 2022). In this context, moral hazard arises when debtors, motivated by short-term financial gains, take on excessive debt, misuse loan funds, or deliberately underestimate their repayment capacity, knowing that the bank bears the ultimate credit risk. Therefore, when extending loans, banks must consider potential credit risks, the possibility of debtor default, among the major risks. Credit risk or the possibility of debtor default can be minimized by applying the 5C principle in credit analysis: character, capacity, capital, collateral, and condition (Surbakti et al., 2024). By applying these principles, banks not only act as intermediaries but also as selective institutions ensuring accurate loan disbursement, as outlined in the Press Release Number SP58/DHMS/OJK/IX/2022 (Otoritas Jasa Keuangan, 2025).

2.2. The Concept of Consumer Credit Non-Performing Loans

According to Otoritas Jasa Keuangan (2023), loans are categorized into three types: working capital loans, investment loans, and consumer loans. In each annual report of state-owned banks, working capital and investment loans are described as credit facilities granted to debtors to meet their working capital and capital goods needs. In contrast, consumer loans are individual credit facilities for non-mortgage

loans, including employee and retiree loans, online loans, credit cards, vehicle loans, and other consumptive or multipurpose loans, as well as mortgage loans. Each type of loan carries different credit risks depending on its characteristics and purposes. For instance, working capital loans are associated with cash flow or business condition risks, investment loans with project progress risks, and consumer loans with the debtor's personal financial changes (Desda & Yurasti, 2019). Credit risk arises when a debtor fails to fulfill obligations to the bank, and the accumulation of such risks can adversely affect the bank's profitability, liquidity, and overall financial stability, thereby weakening the banking system's health.

Non-Performing Loans (NPLs) refer to substandard, doubtful, and default loans in which debtors fail to make agreed-upon installment payments. NPLs represent loans that no longer generate interests due to non-payment for 90 days or more. As an indicator of the banking sector's health, NPL levels are ideally kept below 5%, in line with the regulations from the financial services authority (OJK). NPL is calculated using the following formula:

$$\text{NPL Ratio} = \frac{Non\ Performing\ Loans}{Total\ loans} \times 100 \quad \ldots\ldots\ldots\ldots (1)$$

basic lending rate plays a crucial role, as loan interest rates are highly sensitive to market fluctuations and significantly affect debtors' repayment capacity, higher rates can increase installment burdens and default risk (Louzis et al., 2012; Beck et al., 2015; Pancotto et al., 2024). Conversely, Effendi (2016) found that lower rates may boost loan demand and credit distribution, while it can also increase default risk due to moral hazard from information asymmetry (Muzayyinulhaq, 2019; Cortés & Soriano, 2024). According to Jung (2024), under the quantity theory of money, moral hazard-induced credit expansion can trigger inflation, reflected in the rising CPI, which erodes debtors' real income and purchasing power, making it more difficult for households to meet fixed loan repayment obligations as living costs increase faster than nominal income (Skarica, 2014; Ghosh, 2015). Inflation can also reduce housing demand and property prices, lowering collateral value and increasing banks' credit risk (Putri et al., 2024; Tajik et al., 2015; Wan, 2018).

2.3. The Effect of Consumer Basic Lending Rate on Consumer Credit Non-Performing Loans

According to macroeconomic theory by Pindyck and Rubinfeld, economics addresses aggregate variables such as GDP, unemployment, inflation, and interest rates (Akbar, 2020). Non-Performing Loans (NPLs) in the banking system are mainly explained through interest rate variables (Louzis et al., 2012). Interest rates apply to various loan types, including working capital, investment, and consumer loans (both mortgage and non-mortgage loans). The rate applied is the basic lending rate, the minimum interest set by banks, used as a benchmark to determine rates for different loan products. In Indonesia, changes in the Bank Indonesia policy rate are transmitted to banks' basic lending rates, particularly in state-owned banks, thereby influencing borrowing costs and consumer credit behavior.

The lending interest rate significantly impacts problematic loans in the banking sector. Empirical findings indicate that a 1% increase in lending interest rates is associated with an increase in NPL ratios of approximately 0.2–0.4%, with consumer

NPLs being the most sensitive to interest rate changes (Louzis et al., 2012). Research revealed that consumer NPLs are most sensitive to interest rate changes, largely because consumer loans often have floating rates that fluctuate with the market conditions. When loan interest rates rise, repayment costs increase, raising the likelihood of debtor defaults. Higher lending rates can worsen debtors' financial situations, making it harder for them to meet the debt obligations (Wijaya, 2019). This is supported by Beck et al. (2015) and Atichasari et al. (2023), who found a significant positive relationship between lending rates and NPLs.

H1: *Consumer Basic Lending Rate positively and significantly affects Consumer Credit Non-Performing Loans.*

2.4. The Effect of Consumer Loan Disbursement on Consumer Credit Non-Performing Loans

Joseph E. Stiglitz (2003) proposed a new paradigm in monetary theory focusing on the demand and supply of credit. In this context, banks do not always have symmetric information regarding debtor conditions and must face credit risk (*Stiglitz*, n.d.). Thus, understanding banks' behavior and risk management capabilities is crucial, especially in the presence of market imperfections in credit provision. Banks' behavior plays a pivotal role in the dynamics of the overall economy. While acting as intermediaries, banks mobilize funds from the society with relatively small capital and channel them into loans. However, lending inherently involves the risk of default due to the economic conditions or other factors. Even with monitoring and screening, information asymmetry persists, leading banks to factor credit risk into their lending decisions and affecting debtors' ability to repay (Muzayyinulhaq, 2019). This view is supported by studies from Chavan & Gambacorta (2019) and Cortés & Soriano (2024), who found that the volume of credit disbursed has a significant positive effect on NPLs.

H2: *Consumer Loan Disbursement positively and significantly affects Consumer Credit Non-Performing Loans.*

2.5. The Effect of Consumer Price Index on Consumer Credit Non-Performing Loans

The Consumer Price Index (CPI) is an inflation and macroeconomic indicator, calculated as:

$$\text{CPI} = \frac{Current\ Year\ Price}{Base\ Year\ Price} \times 100 \qquad \ldots\ldots\ldots\ldots (2)$$

According to research by Skarica (2014), when CPI increases, NPLs also tend to rise because higher prices for goods and services weaken consumer purchasing power, especially if income does not increase simultaneously. Thus, debtors may struggle to meet their credit obligations, increasing the likelihood of default. If inflation trends upward while purchasing power remains weak, it may threaten the financial stability. This finding is supported by Ghosh (2015) and Linda et al. (2015), who concluded that CPI has a significant positive effect on NPLs.

H3: *Consumer Price Index positively and significantly affects Consumer Credit Non-Performing Loans.*

2.6. The Effect of Residential Property Price Index on Consumer Credit Non-Performing Loans

The Residential Property Price Index (RPPI) measures changes in housing prices over time, reflecting property market conditions and their impact on the banking sector and household consumption. According to Chen et al. (2020), rising housing prices can trigger a wealth effect, where individuals feel wealthier as the value of their assets increases. Viewing their home as a financial cushion during hardship, this wealth effect encourages higher consumption and borrowing behavior (Zhang & Deng, 2022). Research by Sefriyani & Khoirudin (2021) also supports the idea that increasing RPPI may lead to rising NPLs due to moral hazard, as debtors might assume collateral values will remain high, leading to riskier borrowing behavior. Conversely, other studies (Tajik et al., 2015; Ghosh, 2015; Wan, 2018) suggest that higher RPPI can lower NPLs because increased collateral value strengthens debtors' repayment abilities. Even in cases of default, banks can foreclose and resell the property at a higher price to cover loan losses.

H4: *Residential Property Price Index negatively and significantly affects Consumer Credit Non-Performing Loans.*

2.7. The Effect of Debt Service Ratio on Consumer Credit Non-Performing Loans

The debt service ratio (DSR) is calculated as the ratio of debt payments to disposable income (*Bank for International Settlements*, 2025) :

$$\text{DSR} = \frac{Total\ debt\ payments}{Total\ disposable\ income} \times 100 \qquad \ldots\ldots\ldots\ldots (3)$$

The DSR measures the proportion of disposable income used for debt repayments and serves as a key indicator of a debtor's ability to meet credit obligations and a proxy for moral hazard, reflecting both the ability and willingness to repay. A higher DSR generally reduces default risk and lowers non-performing loans (NPLs), as supported by Gamba-Santamaria et al. (2024), who found that improved repayment capacity leads to declining NPLs amid favorable economic conditions, such as controlled interest rates and inflation. O'Toole & Slaymaker (2021) further confirmed a significant negative relationship between DSR and NPLs, driven by stable incomes and job availability. However, if a high DSR coincides with rising NPLs, it may indicate moral hazard, where debtors accumulate loans beyond their repayment capacity (Ybrayev et al., 2024).

H5: *Debt Service Ratio negatively and significantly affects Consumer Credit Non-Performing Loans.*

2.8. The Effect of Another External Banking Factor on Consumer Credit Non-Performing Loans

The BI 7-Day Reverse Repo Rate (BI rate), as the national benchmark interest rate, plays a crucial role in influencing banking quality through NPLs and is included as a control variable due to its close links with the consumer loan base rate, loan disbursements, consumer price index, residential property price index, and debt service ratio. Wiralaga et al. (2019) noted that a rising BI rate increases lending rates

and debtors' interest burdens, potentially worsening credit quality. Purba et al. (2016) found that it increases banks' cost of funds and slows credit disbursement. Beureukat (2022) highlighted its correlation with inflation via aggregate demand control, though it also adds short-term cost pressures on debtors. Qorimah et al. (2022) reported that a rising BI rate reduces property credit demand. Lastly, O'Toole & Slaymaker (2021) emphasized that BI rate fluctuations affect the debt service ratio through changes in debtors' repayment burdens. Therefore, including the BI rate helps capture its influence across all independent variables in this study.

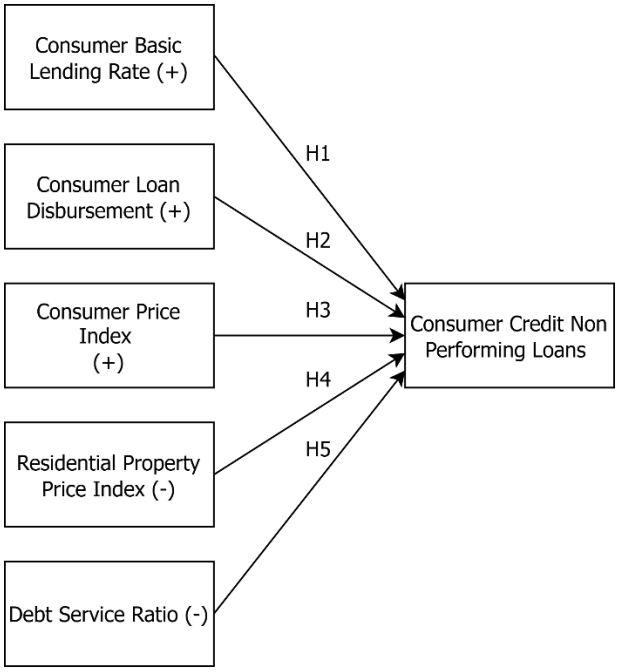

Figure 2. Path Diagram

Source: Authors (2025).

3. METHODOLOGY

Quantitative research is the approach used in this study. The population consists of 52 observations, comprising all state-owned banks, namely Bank Rakyat Indonesia (BRI), Bank Mandiri, Bank Negara Indonesia (BNI), and Bank Tabungan Negara (BTN), with data collected from each bank over the period 2011–2023. In this study, each cross-sectional unit has repeated observations over time (time series), making panel data regression the appropriate analytical approach (Basuki & Prawoto, 2009). To address potential endogeneity arising from simultaneity and omitted-variable bias, particularly between lending rates, loan disbursements, and NPLs, the analysis uses panel data techniques that incorporate bank-specific and time effects, thereby controlling unobserved heterogeneity. In addition, macroeconomic variables such as CPI, RPPI, and the BI 7-day (reverse) repo rate are treated as exogenous, policy- or market-driven, reducing reverse causality concerns. The regression model used in this research is as follows:

$$NPLi,t = \alpha + \beta_1 CBLR_{i,t} + \beta_2 CLD_{i,t} + \beta_3 CPI_{i,t} + \beta_4 RPPI_{i,t} + \beta_5 DSR_{i,t} + \gamma_1 BI\_rate_{i,t} + \varepsilon_{i,t}$$

Given:

NPLi,t	=	Non-Performing Loan of consumer loans for bank i in period t, representing the level of credit risk in consumer lending
β1, β2, β3, β4, β5	=	Regression coefficients measuring the magnitude and direction of the relationship between explanatory variables and NPLs
$BLR_{i,t}$	=	Consumer Basic Lending Rate for bank i in period t, reflecting the cost of borrowing faced by consumers
$CLD_{i,t}$	=	Consumer Loan Disbursement for bank i in period t, indicating the scale of consumer credit expansion
$CPI_{i,t}$	=	Consumer Price Index in period t, capturing inflationary pressure that affects borrowers' real income and repayment capacity
$RPPI_{i,t}$	=	Residential Property Price Index in period t, representing changes in housing prices and collateral values that influence credit risk
$DSR_{i,t}$	=	Debt Service Ratio in period t, measuring borrowers' debt repayment burden relative to income
$BI\_rate_{i,t}$	=	BI 7-day (Reverse) Repo Rate in period t, reflecting the monetary policy stance that influences lending rates and credit conditions
$\varepsilon_{i,t}$	=	Error term, capturing unobserved factors affecting consumer NPLs

Gujarati (1972) stated that there are commonly used methods for estimating panel data regression models, namely the common effect model (CEM), fixed effect model (FEM), and random effect model (REM). Therefore, this study begins the data analysis by selecting the best model using the Chow test and the Lagrange multiplier test, followed by classical assumption tests, including tests for multicollinearity, heteroscedasticity, and autocorrelation.

3.1. Chow Test

Table 1. Chow Test

Variable	Coefficient	P > |t|
CBLR	0.2037216	0.242
CLD	0.3187389	0.687
CPI	0. 0183562	0.892
RPPI	0. 0007548	0.964
DSR	- 0.743618	0.195
*BI_Rate	- 0.1624323	0.376
R-Squared = 0.0349		Prob > F = 0.1393

Source: Data processed (2025).

Based on Table 1, the Chow test results show that the Prob > F value is 0.1393, which exceeds the 0.05 significance threshold. This indicates that the null hypothesis (H_0) is accepted, meaning that the CEM is more appropriate than the FEM. These results imply that there are no significant differences among the entities or cross-

sectional units in this study, so that the FEM is not necessary. In other words, the relationship between the independent and dependent variables is assumed to be homogeneous across all observed entities. Therefore, the CEM is considered more suitable, as it assumes that all entities exert the same effect on the analytical results. The analysis is then followed by a comparison between the CEM and the REM.

3.2. Lagrange Multiplier Test

Table 2. Lagrange Multiplier Test

Variable	Coefficient	P > |z|
CBLR	0. 0423924	0.781
CLD	- 0.9714177	0.000
CPI	0.0105634	0.938
RPPI	0.0231239	0.015
DSR	- 0.3558471	0.508
*BI_Rate	- 0.1502122	0.417
R-Squared = 0.4484		Prob > Chi2 = 0.00

Estimated Result = y[id,t] = Xb + u[id] + e[id,t]

	Var	SD = sqrt(Var)
y	1.01884	1.009376
e	0.5995242	0.7742895
u	0.0217968	0.1476376
Test: Var(u) = 0		
	Chibar2(01)	= 0.09
	Prob > Chibar2	= 0.3799

Source: Data processed (2025).

Furthermore, based on Table 2, the results of the Lagrange multiplier test show that the Prob > Chibar² value is 0.3799, which exceeds the 0.05 significance threshold. This indicates that the null hypothesis (H_0) is accepted, meaning that the CEM is more appropriate than the REM. These results imply that the variation across entities in the data is insufficient to justify the use of the REM. In other words, there are no entity-specific random effects that influence the relationship between the independent and dependent variables. Therefore, the CEM is considered more suitable, as it assumes that all entities have the same effect without the presence of specific random effects.

4. RESULTS AND DISCUSSION

4.1. Results

The selected model, based on the model selection process, is the common effect model, with the regression results as shown in Table 3.

Table 3. Common Effect Model Regression

Variable	Coefficient	P > |t|
CBLR	0.0278453	0.856
CLD	- 0.9998039	0.000
CPI	0.0083614	0.952

Variable	Coefficient	P > |t|
RPPI	0.0233141	0.017
DSR	- 0.3203479	0.556
*BI_rate	- 0.1465908	0.437
R-Squared = 0.4486		Prob > F = 0.0001

Source: Data processed (2025).

Subsequently, classical assumption tests were conducted. The multicollinearity test as shown in Table 4 indicated that all independent variables had variance inflation factor (VIF) values below 5, with a mean VIF of 3.10, suggesting no multicollinearity issue.

Table 4. Multicollinearity Test

Variable	VIF	1 / VIF
*BI_rate	4.27	0.234454
CBLR	3.97	0.252007
CPI	3.69	0.271298
DSR	2.83	0.353360
RPPI	2.47	0.405196
CLD	1.40	0.716571
Mean VIF	3.10	

Source: Data processed (2025).

The heteroscedasticity test, based on the Breusch–Pagan/Cook–Weisberg method, produced a p-value of 0.9662, which exceeds the 0.05 significance level, indicating the absence of heteroscedasticity.

Table 5. Heteroscedasticity Test

Breusch–Pagan/Cook–Weisberg test	
H0: Constant variance	
Chi2(1)	= 0.00
Prob > Chi2	= 0.9662

Source: Data processed (2025).

Furthermore, the autocorrelation test yielded a Durbin-Watson statistic of 1.8199, which falls within the acceptable range (dU < DW < 4-dU), confirming no presence of autocorrelation. Therefore, it can be concluded that the regression model fulfills all classical assumption tests.

Table 6. Autocorrelation Test

Dwatson test		
Durbin-Watson d-statistic (6, 52) = 1.8199		
Tabel Dwatson (sig.5%), k=6 N=52		
dL = 1.3090	dU = 1.8183	4-dU = 2.1817

Source: Data processed (2025).

4.2. Discussion

4.2.1. The Effect of Consumer Basic Lending Rate on Consumer Credit Non-Performing Loans

The CBLR is a key factor in bank credit risk management, particularly in maintaining the quality of the consumer loan portfolio. According to Louzis et al. (2012), rising CBLR increases debtors' installment burdens, potentially raising NPLs. This study hypothesizes a positive and significant relationship between CBLR and consumer NPLs, as higher interest rates typically reduce repayment capacity. However, the results show that CBLR does not significantly affect NPLs, which is consistent with the findings by Darmansyah et al. (2015) and Pancotto et al. (2024).

This insignificance may be explained by the economic conditions supporting debtor resilience. From 2011 to 2023, the average CBLR across BUMN banks gradually declined: BRI (-2.37%), Mandiri (-2.94%), BNI (-3.25%), and BTN (-2.82%) (Bursa Efek Indonesia, 2025), improving debtors' ability to repay loans. Additionally, the economic growth—reflected in the average national income growth of 5.38% per year (Bank Indonesia, 2025), declining unemployment at -3% per year (World Bank, 2025), and decline of poverty at -1.10% per year (Badan Pusat Statistik, 2025)—enhanced repayment capacity despite interest rate changes (Pancotto et al., 2024; Cortés & Soriano, 2024).

Furthermore, mortgage loans (KPRs) are disbursed by state-owned banks (Bursa Efek Indonesia, 2025). One key program, housing finance liquidity facility (Fasilitas Likuiditas Pembiayaan Perumahan/FLPP), targets low-income groups with a fixed 5% interest rate throughout the loan term, protecting debtors from market fluctuation or CBLR rates (Kementerian PUPR, 2025).

Table 7. PEN Interest Rate Subsidy Scheme

Credit plafond	First 3 months subsidy	Second 3 months subsidy
<=Rp500.000.000,00	6%	3%
>Rp500.000.000,00 to Rp10.000.000.000,00	3%	2%

Source: Data processed (2025).

During the COVID-19 pandemic, the government also launched the PEN program, offering six months of interest subsidies for consumer loans, including productive-use vehicle loans (Kredit Kendaraan Bermotor) and housing loans for houses of type 21–70 (Otoritas Jasa Keuangan, 2025). Though temporary, PEN's effects persist in longitudinal data that help explain why CBLR had no significant impact on NPLs in this study.

4.2.2. The Effect of Consumer Loan Disbursement on Consumer Credit Non-Performing Loans

Consumer loan disbursement (CLD) is a key banking performance indicator, particularly in credit risk management. According to information asymmetry theory, higher loan disbursements increase credit risk exposure, potentially raising non-performing loans (NPLs). Thus, this study hypothesized a significant positive

relationship between CLD and consumer NPL. However, the findings reveal the opposite: CLD significantly affects NPL negatively, which is consistent with the findings of Accornero et al. (2017) and Pancotto et al. (2024)

This negative relationship might result from economic factors supporting credit quality. Rising consumption, averaging 4.19% annual growth (The FRED, 2025), reflects declining poverty and higher household spending. As noted by Zhang et al. (2024), growing consumption suggests a consumerist lifestyle that boosts credit demands as supported annual CLD growth of 15.26% at BRI, 13.26% at Mandiri, 12.89% at BNI, and 13.27% at BTN (Bursa Efek Indonesia, 2025). Although increased lending typically raises NPL (Cortés & Soriano, 2024), effective credit risk mitigation can prevent this.

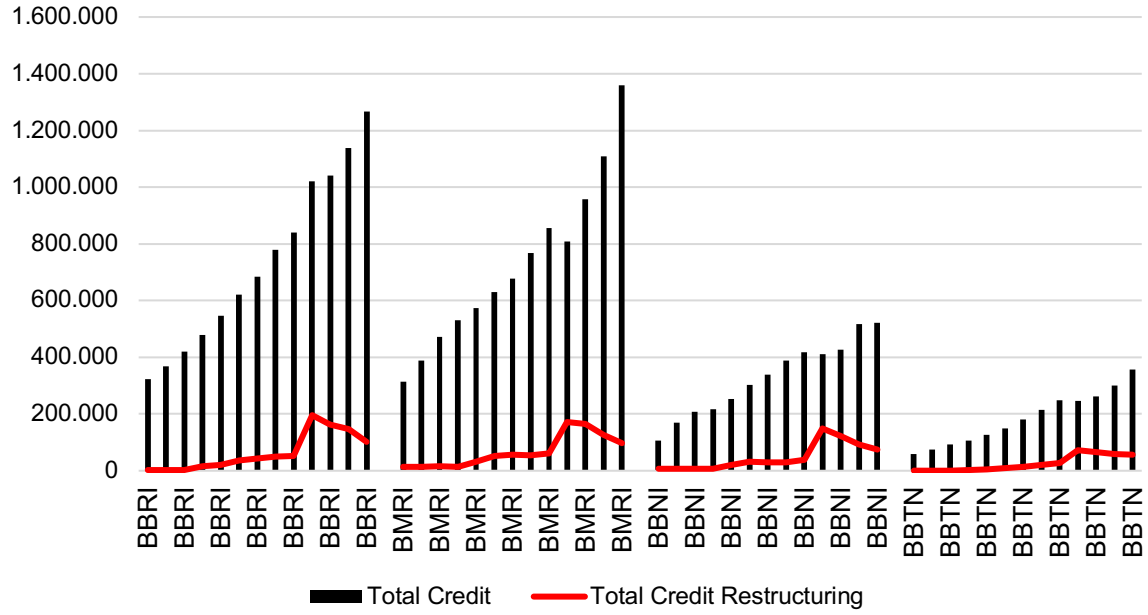

Figure 3. Total Credit Restructuring of Total State-Owned Bank Credit 2011-2023 (in Billion)

Source: Data processed (2025).

First, banks apply loan restructuring in line with the Bank Indonesia Regulation No. 10/18/PBI/2008, which limits restructurings to three times and requires solid documentation which helps maintain loan quality and stability (Miosido & Siswani, 2024). Restructuring trends rose from 2011 to 2018 and spiked in 2020 due to COVID-19, with BRI up to 284.31%, Mandiri 186.79%, BNI 287.76%, and BTN 169.92%. A sharp decline followed in 2021–2023, reflecting economic recovery and improved debtor's repayment.

Second, risk mitigation is reinforced by POJK No. 42/2017 Article 3, which mandates prudent lending via the 5C principles. This selective credit distribution aims to prevent rising NPLs (Otoritas Jasa Keuangan, 2025). As per Nurkhafifa et al. (2024) and Y. Putri et al. (2024), state-owned banks effectively assess debtor risk profiles, enabling selective disbursement. Supporting this, the 2022 consumer index lending standard (ILS) was the second-highest among loan types at 2.6%, and in 2023, the highest at 0.02%, indicating strict lending practices (Bank Indonesia, 2025;

Databoks, 2025). Therefore, due to these combined mitigation strategies, CLD shows a significant negative impact on consumer NPLs in this study.

4.2.3. The Effect of Consumer Price Index on Consumer Credit Non-Performing Loans

Inflation, measured by the consumer price index (CPI), is often considered a key macroeconomic factor affecting credit quality in the banking sector. High inflation can erode income, reduce purchasing power, and increase default risk. This study hypothesized a significant positive relationship between CPI and NPL in consumer credit, meaning higher inflation should lead to higher NPLs due to weakened debtor repayment capacity. However, the analysis shows that CPI has no significant effect on consumer NPLs, consistent with the findings of Darmansyah et al. (2015) and Pramudito et al. (2019), who found minimal inflation's impact on NPLs in banks with strong risk mitigation mechanisms.

Two key factors explain this insignificance. First, from 2011 to 2023, income growth outpaced inflation. Based on data from Badan Pusat Statistik (2025) and the World Bank (2025), average annual growth in regional minimum wages (Upah Minimum Regional/UMR) was 9.68%, while inflation averaged 6%, suggesting stable purchasing power and unaffected repayment ability. Second, inflation remained largely stable during the study period (Bank Indonesia, 2025)showed in 8 of 13 years (2011, 2012, 2016 to 2020, and 2023) it stayed within Bank Indonesia's target range, indicating a relatively controlled economic environment. With income growing faster than inflation and inflation staying within target most of the time, CPI's impact on consumer NPLs was minimal and statistically insignificant in this study.

4.2.4. The Effect of Residential Property Price Index on Consumer Credit Non-Performing Loans

The Residential Property Price Index (RPPI) reflects property market trends and is often used to assess credit collateral. According to Wan (2018), rising RPPI benefits banks by increasing collateral value, allowing them to cover losses from NPLs through higher recovery values. Based on this, the study hypothesized that RPPI would have a significant negative effect on consumer NPLs. However, the analysis shows a significant positive effect, in line with Sefriyani & Khoirudin (2021).

The decline in real house values can explain this unexpected result. While nominal prices rise, debtors perceived increased wealth and took on more credit to fund consumption (Chen et al., 2020; Zhang & Deng, 2022). However, when actual market values fell below fundamental values, repayment risks increased. From 2011 to 2023, real RPPI declined by an average of –0.20% annually (The FRED, 2025).

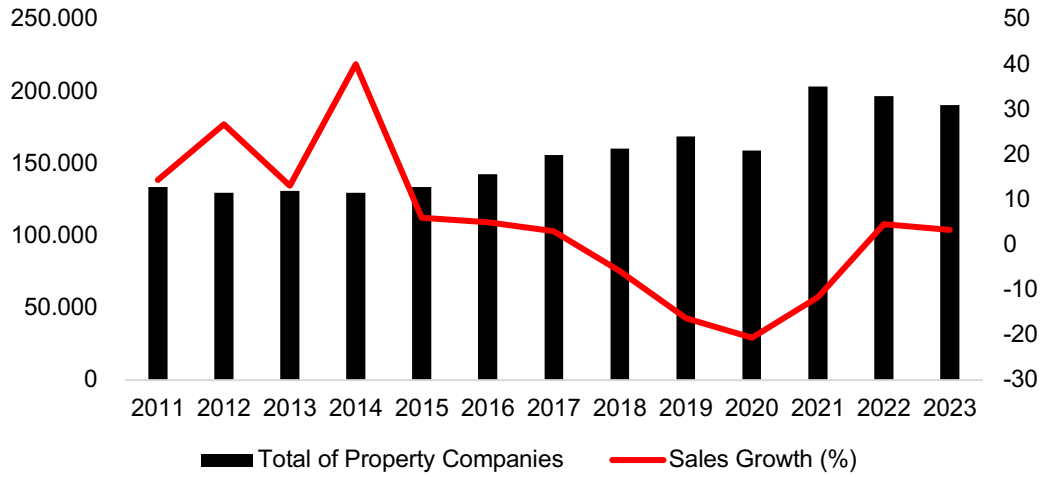

Figure 4. Total of Property Companies VS Sales Growth 2011-2023

Source: Data processed (2025).

This drop is linked to oversupply, as the number of construction firms grew by 3.31% annually (Badan Pusat Statistik, 2025), it boosts housing supply. However, the demand did not keep up, average housing sales declined by –15.92% per year (Bank Indonesia, 2025). Demand fell due to the rising cost of building materials, bureaucratic hurdles, high down payments, and tax burdens. With supply outpacing demand, asset values fell, eroding debtors' collateral and financial buffers. As asset reserves shrank, repayment capacity shrank and default risk raised (O'Toole & Slaymaker, 2021). Hence, increasing RPPI ultimately led to higher consumer NPLs in this study.

4.2.5. The Effect of Debt Service Ratio on Consumer Credit Non-Performing Loans

The debt service ratio (DSR) measures the portion of a borrower's income used to repay debt. According to Gamba-Santamaria et al. (2024), higher DSR indicates consistent repayment, which should reduce NPLs. However, this study found no significant effect of DSR on consumer NPLs, aligning with Boumparis et al. (2019), who also reported no clear NPL reduction despite rising DSR. This suggests other factors may influence repayment ability. O'Toole & Slaymaker (2021) and Prasad & Mathur (2022) emphasize that debtors with liquid assets, such as savings, can still repay loans reliably. In line with Otoritas Jasa Keuangan (2025), the repayment capacity (RPC) cap is set at 50% of income, ensuring debtors retain income for other needs, including savings. Additionally, banks often require fixed income for loan eligibility, supporting financial stability.

Table 8. Indonesian Household Capital Balance

Year	Sources of Financing		Financing Purposes		
	Savings	Capital Received	Gross Fixed Capital Formation	Inventory	Net Lending
2011	513	39	185	42	325
2012	547	88	270	22	343
2013	618	78	283	-53	466

Year	Sources of Financing		Financing Purposes		
	Savings	Capital Received	Gross Fixed Capital Formation	Inventory	Net Lending
2014	602	102	195	55	455
2015	606	96	193	52	456
2016	645	123	242	50	471
2017	811	126	262	40	636
2018	965	130	573	97	425
2019	840	93	800	49	48
2020	626	105	765	-33	114
2021	952	84	845	28	365
2022	1393	64	931	12	593
2023	896	32	880	21	101

Source: Data processed (2025).

From 2011 to 2023, household savings grew by 7.76% annually (Badan Pusat Statistik, 2025), enabling borrowers to repay debts without solely relying on income. Furthermore, households maintained a positive net lending position, with average annual growth of 24.41%, indicating surplus funds invested through banks or capital markets (Badan Pusat Statistik, 2025). Together, growing savings and net lending strengthened household liquidity beyond income alone, two key aspects of the 5C credit principles: capacity and capital.

Moreover, 58.59% of mortgage loans (KPR) from state-owned banks were (Bursa Efek Indonesia, 2025), particularly under the mortgage-linked down payment assistance (*Bantuan Pembiayaan Perumahan Berbasis Tabungan/*BP2BT) program which offers down payment support of up to Rp40 million for low-income groups (Kementerian PUPR, 2025), reducing the need for personal funds. In the *non-KPR* segment, 76.42% of loans were payroll-based (Bursa Efek Indonesia, 2025), primarily granted to debtors with stable incomes. These loans are repaid through automatic salary deductions, minimizing reliance on debtor-managed budgeting. Altogether, these factors explain why DSR had no significant impact on consumer NPLs in this study.

5. CONCLUSION

Findings reveal that consumer NPLs are driven more by internal risk management practices and market dynamics than by macroeconomic indicators or interest rate policy alone. In conclusion, the consumer basic lending rate does not have a significant effect on consumer credit NPLs, as favorable economic conditions and policy support offset its impact on borrowers' repayment capacity. The sustained decline in CBLR, together with income growth, declining unemployment, and reduced poverty, strengthened debtors' ability to repay debt despite interest rate changes. Moreover, subsidized housing programs such as FLPP and temporary interest subsidies under the PEN program insulated debtors from fluctuations in market lending rates. As a result, the transmission of CBLR changes to consumer credit NPLs is substantially weakened. The consumer price index does not have a significant effect on consumer credit NPLs because inflationary pressures were effectively offset by stronger income growth during the study period. Average

minimum wage growth consistently exceeded inflation, preserving debtors' purchasing power and repayment capacity. In addition, inflation remained relatively stable and largely within Bank Indonesia's target range, limiting its potential to disrupt household finances. Consequently, CPI fluctuations did not translate into higher consumer credit NPLs in this study.

Additionally, the Debt Service Ratio does not have a significant effect on consumer credit NPLs, as debtors' repayment capacity is supported by liquidity and structural safeguards beyond income alone. Regulatory limits on repayment capacity, rising household savings, and a sustained positive net lending position strengthened debtors' ability to meet debt obligations even at higher DSR levels. In addition, government-supported housing programs and payroll-based lending reduced debtors' reliance on discretionary income and personal financial management. As a result, variations in DSR did not translate into changes in consumer credit NPLs during the study period.

In contrast, the consumer loan disbursement has a significant negative effect on consumer credit NPLs because strong economic fundamentals and disciplined risk management support credit expansion in state-owned banks. Rising household consumption and declining poverty strengthened debtors' repayment capacity, allowing higher credit growth without deteriorating loan quality. Moreover, effective loan restructuring policies helped banks manage distressed loans during economic shocks and restore credit quality during the recovery period. The strict implementation of prudent lending standards, guided by the 5C principles, ensured that loan disbursements remained selective and targeted toward low-risk debtors. High lending standard indicators further confirm conservative credit screening despite rapid loan growth. Consequently, increased CLD reflects improved credit quality and effective risk mitigation rather than heightened NPL risk. While the residential property price index has a significant positive effect on consumer credit NPLs, this is because strong market fundamentals did not support increases in property prices. Although nominal RPPI growth initially created a perception of rising household wealth and encouraged higher loans, real house prices declined over the study period, weakening debtors' financial positions. Oversupply in the housing market, coupled with slowing demand, reduced effective collateral values, and limited banks' recovery capacity. As collateral values eroded, debtors' asset buffers diminished, increasing vulnerability to repayment shocks. Consequently, rising RPPI was associated with higher consumer NPLs rather than improved credit quality in this study.

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