

## Does Interest Rate Impact Economic Growth? Empirical Insight from Nepal

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### Abstract

**Background:** The relationship between interest rates, inflation, and non-performing loans on economic growth is debated in theoretical and empirical research. Hence, the study examines the effect of interest rate, inflation rate, and non-performing loans on the economic growth in Nepal.

**Methods:** The paper incorporated quarterly data spanning nine years (2011-2019) and consisted of 972 observations. The study collected secondary data from the official websites of Nepal Rastra Bank and the Ministry of Finance, Nepal. The study used a panel cointegration test and random-effect models to examine the long-run relationship between predictor and response variables.

**Results:** The impact of lending rate (LR) on economic growth is positive and statistically significant ( $\beta_1 = 0.017$ ,  $p < .01$ ) in Nepal. Similarly, the coefficient of LNCPI ( $\beta_2 = 0.687$ ,  $p < .01$ ) suggests that there is a positive relationship between the Consumer Price Index (CPI) and the Gross Domestic Product (GDP). The regression coefficient of CPI ( $\beta_3 = -.001$ ,  $p > .05$ )

suggests that an increase in non-performing loans (NPL) led to a decrease in GDP. However, this relationship was not statistically significant for the Nepalese Economy.

**Conclusion:** The study concludes that the interest and inflation rates positively affect Nepal's economic growth. The findings indicate that policymakers, such as Nepal Rastra Bank, should maintain interest rates at an appropriate level.

**Novelty:** This study is novel because it thoroughly analyzes numerous observations over long periods to investigate the impacts of loan rates, inflation rates, and non-performing loans on economic growth in Nepal, improving its generalizability.

**Keywords:** economic growth, interest rate, inflation, non-performing loan

## **Introduction**

The link between interest rates, inflation, and non-performing loans on economic growth is debated in theoretical and empirical studies. Interest rates serve as price indicators for individuals who provide funds to the economy through saving and lending and those who seek funds by borrowing for capital investments. Raising interest rates creates incentives for increasing the availability of funds while simultaneously decreasing the demand for those funds. Reduced interest rates yield contrasting outcomes (Rose & Marquis, 2008). Raising the interest rate makes capital more expensive, and projects may become infeasible whether their internal rate of returns is lower than the cost of capital. Conversely, the increased cost of borrowing would lead to a fall in consumer aggregate demand, which reduces output volume and hinders overall economic growth (Bernanke & Gertler, 1995).

On the one hand, increased interest rates have an adverse effect on investment decisions by lowering the borrower's net worth, collateral value, profitability, net cash flows, and interest coverage ratio. On the other hand, rising interest rates adversely affect banks' value of securities, impairing their capital and ability to attract funds and leading to reduced lending capacity.

Moreover, even struggling firms can survive at low-interest rates, as they do not need large new loans to meet their interest payments. This leads to an increase in output, which fosters economic growth. Banks need more funds to fulfill their responsibilities to sustain struggling companies but cannot fulfill their responsibilities during the high-interest period, resulting in declining output and economic growth (Chang & Huang, 2010). Some advocates argued that higher interest rates incentivize individuals to increase their savings, which banks allocate towards productive sectors through lending. On the other hand, if the real rate of return is sufficiently low, disintermediation may occur, leading individuals to invest in unproductive assets such as gold and transfer their capital outside (Chang & Huang, 2010). Empirical evidence showed conflicting results on the relationship between interest rates and economic growth. For example, Oroundel et al. (2023) and Davcev et al. (2018) found a negative link between interest and economic growth rates. On the other hand, Lee and Werner (2018) and Akalpler and Duhok (2018) found a significant positive impact of interest rates on economic growth.

Multiple theories and empirical studies evidence that academics are paying significant attention to the relationship between the inflation rate and economic growth. The structuralists and monetarists hold contrasting perspectives on this relationship. The structuralists believe that inflation is necessary for economic growth, while the monetarists argue that it harms economic growth (Malik & Chowdhury, 2001). Structuralists claim that the increase in the price of goods and services results from increasing demand exceeding the supply. On the other hand, monetarists contend that inflation can arise from an increase in the money supply in the financial market. The third group of proponents contended that an increase in inflation partially stimulates the accumulation of capital, which can subsequently be utilized for additional investment, finally resulting in an upsurge in production, employment, and economic expansion (Uddin & Rahman, 2023). Empirical evidence showed conflicting results on the relationship between inflation and economic growth. For example, Uddin (2021) and Bhusal and Silpakar (2011) found a positive link between inflation and economic growth rates. On the other hand, Aydin (2016) and Becha et al. (2023) found a moderate level of inflation would favor economic growth.

Individuals and businesses tend to deposit their savings in banks if they have strong public confidence. This faith encourages borrowing from banks, leading to increased investment and consumption. When banks build more non-performing loans, it can undermine the public's confidence in the banking sector. This may result in reduced savings, limited credit alternatives, and decelerated economic growth. In order to safeguard individuals' savings, the government must allocate tax funds. Consequently, the reduction in government investment in public sectors will decelerate economic growth (Rose & Marquis, 2008). Likewise, Non-Performing Loans (NPL) can undermine the financial strength of banks, diminishing their capacity to provide loans and raising the expense of borrowing. A credit crisis can arise, causing businesses and individuals to encounter challenges in securing funding, resulting in a deceleration of economic activity (Goyal et al., 2023). Empirical studies by Skaria (2014) and Klein (2013) have established a significant correlation between a rise in non-performing loans and economic downturns.

The impact of bank lending rate, inflation, and non-performing loans (credit risk) on economic growth is still inconclusive; numerous studies have confirmed the presence of any positive and negative between the abovementioned macroeconomic variables. Therefore, with the more recent dataset, this empirical study first gives insight into the relationship between interest rate, inflation rate, credit risk, and economic growth in the Nepalese context.

The rest of the paper is organized as follows: The second section includes a review of theoretical and empirical studies, the Third section describes a method, the Fourth section presents findings, the Fifth section describes the findings, and the last section ends with the conclusion.

### **Research Objective**

The study's main objective is to examine the impact of bank lending rates on economic growth in Nepal. However, it also examines the impact of the consumer price index (CPI) and non-performing loans on economic growth in Nepal.

## **Literature Review**

### **Theoretical review**

The Credit Channel Theory (CHT), proposed by [Bernanke and Gertler \(1995\)](#), is a theoretical framework that elucidates the relationship between monetary policy adjustments and their impact on the availability and demand for credit and the subsequent impacts on the real economy. Credit channel theory states that interest rate fluctuations directly impact lenders' anticipated earnings and expenses incurred by potential borrowers.

The theory posits that the impact of the interest rate (policy rate) on the real economy can be clarified by two aspects: The balance sheet channel refers to the potential impact of changes in interest rates on a borrower's balance sheets and income statements. It includes variables such as the borrower's net worth, cash flow, liquid assets, and interest expenses. On the other hand, the bank lending channel explains the effect of changes in interest rates on the supply of loans by depository institutions.

An increase in interest rates diminishes the borrower's overall financial value and amplifies interest costs. Moreover, it diminishes the collateral value and the borrower's financial ratio, such as the interest coverage ratio, which are crucial factors in obtaining a loan at a favorable interest rate. Hence, the decrease in borrowers' collateral value and profitability resulting from rising interest rates adversely affects investment and spending decisions, thereby negatively influencing real GDP. The bank lending channel illustrates the mechanism by which changes in interest rates impact the real economy via the banking sector. As per the hypothesis, an increase in interest rates impacts the expenses associated with deposits and loans for banks, which could ultimately decrease lending. In contrast, reduced interest rates may incentivize banks to increase their lending activities. Similarly, when interest rates are lower, it encourages banks to provide more credit because the costs of deposits and borrowing are reduced. Furthermore, a decrease in interest rates encourages greater credit demand from businesses and individual borrowers. Moreover, an increase in interest rates might impact the willingness and capacity of banks to facilitate the transfer of funds, thus influencing the general flow of credit in the economy. Likewise, a rise in interest rates negatively impacts the worth of assets and liabilities on a bank's balance sheet, influencing its financial state and ability to lend.

### **Empirical review**

#### **Interest rate**

The link between financial development and economic growth of Jordan was examined by [Oround et al. \(2023\)](#) using ADRL bound testing model. The investigation included annual data spanning from 1980 to 2020. Findings indicate that long-term and short-term real interest rates significantly negatively affect economic growth rates. Similarly, by utilizing Granger causality analysis, [Davcev et al. \(2018\)](#) analyzed the impact of interest rate and inflation rate on GDP in Bulgaria, Romania and FYROM. The analysis revealed a negative link between interest rates and GDP. The results of the Granger causality test revealed a unidirectional causal relationship between GDP and interest rates in Bulgaria. In Romania, there appears to be a unidirectional relationship where changes in interest rates influence the country's GDP. In contrast, there was a unidirectional correlation from GDP to interest rate.

Lee and Werner (2018) investigated the hypothesis that the belief in lower interest rates leads to faster economic growth and that higher interest rates lead to weaker growth. They collected quarterly data from 1957 Q1 to 2008 Q4 for the United Kingdom, United States, and Japan. The findings indicate that interest rates are closely linked to GDP growth and consistently correlate positively with economic growth. Similarly, Chang and Huang (2010) investigated the link between real interest rates and the strength of the finance-growth relationship in the Japanese economy. This study employed various econometric models with quarterly data from 1981Q2 to 2008 Q3. The study's findings indicate that an increase (decrease) in real interest rates has a notably positive (negative) impact on economic growth. It suggested that implementing a low-interest rate policy will harm the promotion of economic growth in Japan. Akalpler and Duhok (2018) investigated the link between monetary policy and economic growth in Malaysia. The study utilized interest rates, inflation, and money supply as predictor variables and GDP growth as the outcome variable. The OLS method examined the relationship between the predictor and response variables. The study indicated a strong positive relationship between interest rates and economic growth.

Islam et al. (2021) analyzed the impact of monetary policy on economic growth in both a developing nation (Bangladesh) and a developed country (UK) from 1980 to 2019. The study analyzed both the short-term and long-term effects of monetary policy. By utilizing the ADRL, ECM, and VCEM methodology, the study discovered a negative correlation between interest rates and economic growth in both countries. The study proposes the following hypothesis based on the theory and empirical findings abovementioned.

*H<sub>1</sub>: Interest rate negatively affects economic growth.*

#### **Inflation rate**

Aydin et al. (2016) examined how inflation affects the economic growth rate of five Turkish Republics by employing a dynamic panel threshold regression model. This study uses the inflation rate as an independent variable and the GDP per capita as a dependent variable. The study findings indicate that the threshold inflation rate for the Turkish Republic is 7.97%. Furthermore, the findings indicated that when the inflation rate exceeds a certain threshold, it harms economic growth. Conversely, when the inflation rate falls below this barrier, it benefits economic growth.

Mallik and Choudhury (2001) studied the relationship between inflation and GDP growth in four prominent South Asian countries: Bangladesh, India, Pakistan, and Sri Lanka. They employed cointegration and error correction models (ECM) using annual data. The findings indicate a positive association between inflation and economic growth, with moderate inflation being beneficial for economic growth. However, faster economic growth hurts inflation. Furthermore, the study revealed that the responsiveness of inflation changes is greater than that of growth to fluctuations in inflation rates.

Uddin (2021) analyzed the influence of inflation on economic development using time series data from 1990 to 2015. The study employed the ADF test to determine stationarity and the Engle-Granger Co-integration test to assess the short- and long-run associations. The study discovered a robust and statistically significant correlation between GDP growth and inflation



in Pakistan. The study revealed a positive correlation between the inflation rate and GDP, indicating that a one-unit increase in the inflation rate leads to a 0.27-unit increase in GDP.

[Kiptum \(2022\)](#) identified Kenya's threshold level of inflation by employing a threshold regression model and analyzing annual data from 1971 to 2019. The study revealed that the optimal inflation rate for Kenya is 5.8%. With a threshold inflation rate of 5.8%, a one-unit increase in inflation resulted in a 2.89% improvement in GDP.

[Sarel \(1996\)](#) investigated the curvilinear correlation between inflation and economic growth. The findings indicated a threshold inflation rate of 8%. Furthermore, it demonstrates minimal favorable impact when the inflation rate is less than 8%. Nevertheless, when the interest rate exceeds 8%, the anticipated impact of inflation on economic growth is substantial, resilient, and exceedingly influential.

[Bhusal and Silpakar \(2011\)](#) examined the threshold level of inflation in Nepal by analyzing yearly data from 1975 to 2010. The study utilized the Granger Causality test to assess the linear causality between inflation and economic growth. The findings indicated a positive correlation between inflation and economic growth, with a threshold inflation value of 6% identified for Nepal.

[Becha et al. \(2023\)](#) analyzed the influence of inflation on economic growth in Tunisia by employing the smooth transition regression model from 1965 to 2019. The findings indicated the presence of a non-linear correlation, with an inflation threshold of 3.6%. The findings demonstrated a notable and favorable influence on economic growth when it was below the threshold level. In contrast, economic growth had a substantial and adverse impact when inflation exceeded the threshold level.

[Razia et al. \(2023\)](#) investigated the impact of unemployment, inflation economic growth in Palestine by using the ADRL and ECC models over the period of 1991-2020. The study's findings revealed a positive and significant effect of inflation on economic growth in long-run. However, it was positive but not significant in the short-run.

[Uddin and Rahaman \(2023\)](#) examined the impact of corruption, unemployment and inflation on economic growth by taking the data of developing countries over the period from 2002 to 2018. By using PUT, PMG, and DOLS, the study found a positive effect of inflation on GDP per capita.

[Riyath \(2018\)](#) conducted a study utilizing annual data to analyze the enduring correlation between inflation and economic growth in Sri Lanka from 1960 to 2015. The study employed the Johansen Co-integration test and VCEM (Vector Error Correction Model). The data revealed a reciprocal relationship between inflation and economic growth. Nevertheless, it failed to demonstrate an immediate cause-and-effect relationship between inflation and economic growth.

[Adaramola and Dada \(2020\)](#) investigated the influence of inflation on economic growth using the ADRL approach. The study utilized interest rate, currency rate, trade openness, money supply, and government expenditure as independent variables to predict outcomes from 1980 to 2018. The results demonstrated that inflation exerts a substantial impact on economic

growth. The interest rate and money supply positively and significantly influenced the growth rate.

[Shiyalini and Bhavan \(2021\)](#) examined the impact of inflation on Sri Lanka's economic growth from 1990 to 2016. The data were obtained from the World Development Indicators. The ADRL bound test co-integration approach was used to analyze the variables' short- and long-run elasticities. The investigation uncovered a persistent co-integrating link between inflation and GDP growth rate, indicating a statistically significant positive relationship in the long term. The study proposes the following hypothesis based on the empirical findings abovementioned.  
*H<sub>2</sub>: The inflation rate positively affects economic growth.*

### **Non-performing loan**

[Ferrira \(2022\)](#) investigated the factors influencing non-performing loans by analyzing World Bank Global Financial Development database data. The study encompassed 80 countries from all continents and covered 1999 to 2019. The data was analyzed using a panel GMM system in the study. The study revealed an adverse relationship between economic growth and non-performing loans. Furthermore, this study discovered a strong correlation between the non-performing loan ratio and an increase in the bank's cost-to-income ratio. Ultimately, the study determined that fostering economic growth hinges on reducing non-performing loans, reducing banks' losses, and mitigating the risk of a financial crisis.

[Gjeci et al. \(2023\)](#) investigated the impact of non-performing loans on bank lending behavior. They analyzed bank-level data from 2000 to 2017, covering 42 countries over the same period. The investigation uncovered a substantial inverse correlation between non-performing loans (NPL) and bank loan growth. Furthermore, this discovery is particularly evident for banks with ample capital.

[Goyal et al. \(2023\)](#) investigated the impact of macroeconomics and institutional environment on NPL in developing and developed countries by using panel system GMM methodology over the period 2010-2020. The study's findings revealed a negative and significant effect of non-performing loan on economic growth in long-run. The study indicates that loan defaults occur less frequently during a rapid economic expansion, leading to reduced levels of non-performing loans. Similarly, in a study by [Klein \(2013\)](#), data from 16 Central, Eastern, and Southeastern European (CESEE) countries was analyzed at the national level between 1998 and 2011. The findings revealed a negative correlation between non-performing loans and GDP growth.

The study proposes the following hypothesis based on the empirical findings abovementioned.  
*H<sub>3</sub>: Non-performing loan negatively affects economic growth.*

### **Methods**

The study investigates the influence of bank lending rates, inflation, and non-performing loans on the real GDP of the Nepalese Economy. It employs descriptive, relational, and causal research design. The paper incorporated quarterly data spanning nine years (2011-2019). The study collected secondary data from the official websites of Nepal Rastra Bank and the Ministry of Finance, Nepal. The study included three independent variables (interest rate, consumer price index, and non-performing loan) to assess the sensitivity of real GDP in Nepal.

These predictor and responder variables were selected based on earlier empirical investigations demonstrating a significant influence on real GDP. The selection of these variables in the study aims to determine a causal relationship between interest rate, consumer price index, non-performing loans, and real GDP in Nepal. The study employed the EViews software to analyze the secondary data. The study included pooled ordinary least squares (OLS), fixed-effect, and random-effect models. The pooled ordinary least squares (OLS) method disregards the influence of individual banks and time, assuming that all individual banks are homogeneous and their characteristics remain constant throughout time (Gujarati & Dawan, 2015). Therefore, the pooled OLS model maintains a consistent constant and coefficient across individual banks and periods.

$$Y_{it} = \beta_0 + \beta_1 X_{it} + u_{it} \dots (1)$$

However, the fixed-effect model assumes that each bank has distinct constants while the coefficients remain constant.

$$Y_{it} = \beta_{0i} + \beta_1 X_{it} + u_{it} \dots (2)$$

The random effect model believed that all the banks have a mean value for the intercept ( $\beta_0$ ). The individual variation in the intercept values for each bank is reflected in the error term  $\epsilon_i$ .

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \epsilon_i + u_{it} \dots (3)$$

In this study, the following regression model is used.

$$\text{LN}GDP_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 \text{LN}CPI_{it} + \beta_3 \text{NPL}_{it} + \mu_{it} \dots (4)$$

Where  $\text{LN}GDP_{it}$  represents the logarithm of real GDP in period  $t$ . The symbol  $\beta_0$  denotes the equation's intercept.  $LR_{it}$  represents the interest rates at which banks lend funds throughout the period  $t$ .  $\text{LN}CPI_{it}$  indicates the logarithm of the consumer price index in period  $t$ .  $\text{NPL}_{it}$  represents the non-performing loan of the bank  $i$  during period  $t$ .  $t$  denotes the temporal span from 2011 to 2019, while  $i$  symbolizes the banks. The terms  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  represent regression coefficients.

## Results

### Descriptive statistics

This section provides the descriptive statistics for the dependent and independent variables, namely the natural logarithm of gross domestic product (LN $GDP$ ), lending rate (LR), natural logarithm of consumer price index (LN $CPI$ ), and non-performing loans and advances (NPL) of Nepalese commercial banks listed in NEPSE from 2011 Q1 to 2019 Q4.

The study encompassed a total of 972 observations. Table 1 shows that the mean values for LN $GDP$ , lending rate, LN $CPI$ , and non-performing loans and advances were 12.150, 11.251, 0.170, and 2.218 correspondingly. The standard deviation of the LN $GDP$  variable was 0.116, ranging from a low value of 11.968 to a maximum value of 12.347. The loan rate (LR) had a minimum value of 8.772, a maximum value of 14.124, and a standard deviation of 1.495. The standard deviation for LN $CPI$  was 0.170, ranging from a minimum value of 4.338 to a maximum value of 4.903. The non-performing loan had a standard deviation of 2.531, ranging from a minimum value of 0.010 to a maximum value of 40.200.



Table 1: Descriptive statistics

Variables	N	Minimum	Maximum	Mean	SD
LNGDP	972	11.968	12.347	12.150	0.116
LR	972	8.771	14.124	11.251	1.495
LNCPI	972	4.338	4.903	4.657	0.170
NPL	972	0.010	40.200	2.218	2.531

### Correlation Matrix

Table 2 displays the correlation matrix between the response and predictor variables. No issue of multicollinearity between the response and predictor variables was detected as all variable values were below 0.80.

Table 2: Correlation Matrix

Variables	LNGDP	LR	LNCPI	NPL
LNGDP	1			
LR	-.128**	1		
LNCPI	.630**	-.347**	1	
NPL	-.221**	.127**	-.246**	1

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

### Panel Unit-Root Tests and Co-Integration Tests

The initial step of the econometric study involved examining whether the variables contained in equation (4) exhibit panel unit-roots. The variables in equation (1) were found to be co-integrated at order one, denoted as I (1). The report excluded the panel unit root test results in order to make it more concise. The study subsequently examined the cointegration of the variables in equation (1) using three distinct methods: Pedroni Residual Cointegration Tests, Kao Residual Panel Cointegration Test, and Johansen-Fisher Panel Cointegration Test. The outcomes of the Pedroni Residual Cointegration Tests are presented in Table 3. In contrast, the Kao Residual Panel Cointegration Test outcomes and Johansen-Fisher Panel Cointegration Test are presented in Table 4 and Table 5, respectively.

The results of the Pedroni Residual Cointegration Tests indicate the presence of cointegration among the four variables. Out of the seven tests conducted, the panel PP-statistic, group rho-statistic, and group PP-statistic support the null hypothesis of no cointegration. On the other hand, the majority of the statistics, specifically four of them, reject the null hypothesis of no cointegration.

Therefore, the study proceeded to confirm the results by conducting additional tests on panel cointegration. The findings of the Kao Residual Panel Cointegration Test are displayed in Table 4. The outcome of the Kao Residual Panel Cointegration Test is very significant at the 0.01 level, leading to the rejection of the null hypothesis that there is no cointegration among the variables. Similarly, the Johansen-Fisher Panel Cointegration Test provides compelling

evidence of cointegration among four variables. The abovementioned finding is presented in Table 5.

Table 3: Pedroni Residual Cointegration Tests

Panel Cointegration Statistics (Within-dimension)				Panel Cointegration Statistics (Between-dimension)		
Panel v-Statistic	Panel rho-Statistic	Panel PP-Statistic	Panel ADF-Statistic	Group rho-Statistic	Group PP-Statistic	Group ADF-Statistic
10.249 (0.000)	-2.479 (0.007)	-1.162 (0.123)	-3.810 (0.001)	-0.235 (.407)	0.239 (0.594)	-3.071 (0.001)

Table 4: Kao Residual Panel Cointegration Test

H <sub>0</sub> : No Cointegration		
Series	t-Statistic	p-Value
LNGDP,LR, LNCPI, NPL	-12.955	0.000

Table 5: Johansen-Fisher Panel Cointegration Test

No. of CE(S)	Fisher Statistic (from trace test)		Fisher Statistic (from max-eigen test)	
None	164.1	0.000	174.7	0.000

### Regression analysis

The study investigates the influence of loan rate, consumer price index, and non-performing loans on GDP by analyzing the long-term relationship between response and predictor variables using three distinct methods in cointegration analysis. The Hausman test indicates that the random effect model significantly outperforms the fixed effect model. Similarly, the Redundant Fixed Effects Tests indicate that the result of POLS is superior to that of the fixed effect model. The Breusch-Pagan test ultimately determines that the random effect model is more suitable than the fixed effect model. Therefore, this study employed a random effect model to examine the impact of lending rate, consumer price index, and non-performing loans on GDP. The results of the regression analysis are presented in Table 6. The Adjusted R-squared score of 0.907 indicates that the regression model has a fair overall explanatory power. This means that 90.7 percent of the variation in GDP can be explained by the variation in the predictor variables. The p-value of the F-statistic unambiguously suggests that this regression model was a good fit. Table 6 reports the effects of lending rate, CPI, and non-performing loan on GDP. The regression coefficient of LR ( $\beta_1 = 0.017$ ,  $p < .01$ ) suggests that an increase in

lending rate is associated with higher economic growth in Nepal. The regression coefficient of LNCPI ( $\beta_2 = 0.687$ ,  $p < .01$ ) suggests that there is a positive relationship between the Consumer Price Index (CPI) and the Gross Domestic Product (GDP). The regression coefficient of LNCPI ( $\beta_3 = -.001$ ,  $p > .05$ ) suggests that an increase in NPL led to a decrease in GDP. However, this relationship was not statistically significant for the Nepalese Economy.

Table 6: Random-effect Model

Variables	$\beta$	Standard error	t-statistic	p-Value
C	8.758	0.0385	227.389	0.000
LR	0.017*	0.001	20.961	0.000
LNCPI	0.687*	0.007	93.335	0.000
NPL	-0.001	0.001	-0.143	0.886
R-squared	0.908	--	--	--
Adjusted R-squared	0.907	--	--	--
F-statistic	3189.849	--	--	0.000
Hauseman Test	Chi-Sq. Statistic (0.000)			0.998
Redundant Fixed Effects Tests (Chow Test)	Statistic (0.048)			0.997
LM Tests	Breusch-Pagan	13.480	12635.440	12648.920
	p-Value	(0.0002)	(0.000)	(0.000)

Note. \*Statistically significant at the 1% level

## Discussions

The coefficient of lending rate ( $\beta_1 = 0.017$ ,  $p < .01$ ) indicates that a higher lending rate led to higher real GDP growth in the Nepalese economy. This finding is in line with the previous findings of Lee and Werner (2018), Chang and Huang (2010), and Akalpler and Duhok (2018) but contradicts the findings of some other studies (for example, Oround et al., 2023; Davce et al., 2018; Islam et al., 2021). Furthermore, this empirical finding did not support the Credit Channel Theory (CHT), proposed by Bernanke and Gertler (1995), and the research hypothesis proposed by this study. The outcome of this regression coefficient can be explained by the fact that higher interest rates incentivize individuals to increase their savings, which banks allocate towards productive sectors through lending. On the other hand, if the real rate of return is sufficiently low, disintermediation may occur, leading individuals to invest in unproductive assets such as gold and transfer their capital outside and hamper economic growth.

The coefficient of the consumer price index ( $\beta_2 = 0.687$ ,  $p < .01$ ) suggests that a higher inflation rate led to higher real GDP growth in the Nepalese economy. This finding is in line with the

previous findings of [Mallik and Choudhury \(2021\)](#), [Uddin \(2021\)](#), [Bhusal and Silpakar \(2011\)](#), [Razia et al. \(2023\)](#), and [Shiyalini and Bhavan \(2021\)](#) but contradicts the findings of some other studies (for example, [Riyath, 2018](#); [Kiptum, 2022](#); [Sarel, 1996](#)). Furthermore, this empirical finding supports the research hypothesis proposed by this study. The outcome of this regression coefficient can be explained by the fact that an increase in inflation partially stimulates the accumulation of capital, which can subsequently be utilized for additional investment, resulting in an upsurge in production, employment, and economic expansion.

The coefficient of NPL ( $\beta_3 = -.001$ ,  $p > .05$ ) suggests that a lower NPL led to higher real GDP growth in the Nepalese economy. However, it is not statistically significant at the 5% significance level. This finding is in line with the previous findings of [Goyal et al. \(2023\)](#), [Klein \(2013\)](#), and [Skaria \(2014\)](#). Furthermore, this empirical finding did not support the research hypothesis proposed by this study. The outcome of this regression coefficient can be explained by the fact that NPL can undermine the financial strength of banks, diminishing their capacity to provide loans and raising the expense of borrowing. In addition, a credit crisis can arise, causing businesses and individuals to encounter challenges in securing funding, resulting in a deceleration of economic activity.

## **Conclusion**

This study aimed to examine the impact of interest rate, inflation rate, and non-performing loans on the economic growth in Nepal. This study employed a random effect model to explain the cause-and-effect relationship between response and predictor variables. The regression model, which incorporated real GDP as the response variable, was statistically significant ( $F = 3189.849$ ,  $< .01$ ), suggesting that the regression model was best fitted. The finding reveals that the banking system's higher interest rate positively affected Nepal's economic growth. Similarly, the higher consumer price index (CPI) positively affected economic growth in Nepal. On the other hand, non-performing loans from Nepalese commercial banks are negatively related to economic growth and are statistically insignificant. These findings can help policymakers like Nepal Rastra Bank take effective action to maintain interest rates and inflation rates at an appropriate level to foster economic growth in Nepal. The study covers only three predictor variables—such as bank lending rate, consumer price index, and non-performing loan—to show the impact on economic growth. Therefore, future research needs to include other variables in the Nepalese context.

## **Author Contribution**

All authors have equal contribution

## **Conflict of Interest**

The authors declare that they do not have any conflicting interests.

## **References**

- Adaramola, A. D., & Dada, O. (2020). Impact of inflation on economic growth: Evidence from Nigeria. *Investment Management and Financial Innovations*, 17(2), 1-13. [https://doi.org/10.21511/imfi.17\(2\).2020.01](https://doi.org/10.21511/imfi.17(2).2020.01)
- Akalpler, A., Duhok, D. (2018). Does monetary policy affect economic growth: Evidence from Malaysia. *Journal of Economics and Administrative Sciences*, 34(1), 2-20. <https://doi.org/10.1108/JEAS-03-2017-0013>
- Aydin, C., Esen, O., & Bayrak, M. (2016). Inflation and economic growth: A dynamic panel threshold analysis for Turkish Republics in transition process. *Procedia- Behavioral Sciences*, 229(2016), 196-205. <https://doi.org/10.1016/j.sbspro.2016.07.129>
- Becha, H., Kalai, V., & Helali, K. (2023). Smooth transition regression model relating inflation to economic growth in Tunisia. *Journal of Economic Structures*, 2023 (12:14), 1-26. <https://doi.org/10.1186/s40008-023-00308-9>
- Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives*, 9(4), 27-48. <https://doi.org/10.1257/jep.9.4.27>
- Bhusal, T. P., Silpakar, S. (2011). Growth and inflation: Estimation of threshold point for Nepal. *Economic Journal of Development Issues*, 13 & 14 (1-2), 131-138. <http://dx.doi.org/10.3126/ejdi.v13i0.7216>
- Chang, S., & Huang, L. (2010). The nexus of finance and GDP growth in Japan: Do real interest rates matter? *Japan and the World Economy*?, 22, 235-242. <https://doi.org/10.1016/j.japwor.2010.06.004>
- Davcev, L., Hourvouladiades, N., Komic, J. (2018). Impact of interest rate and inflation on GDP in Bulgaria, Romania and FYROM. *Journal of Balkan and Near Eastern Studies*, 20(2), 131-147. <https://doi.org/10.1080/19448953.2018.1379746>
- Ferreira, C. (2022). Determinants of non-performing loans: A panel data approach. *Int Adv Econ*, 28, 133-153. <https://doi.org/10.1007/s11294-022-09860-9>
- Gjeci, A., Marinc, M., Rant, V. (2023). Non-performing loans and bank lending behaviour. *Risk Manag*, 25, 7. <https://doi.org/10.1057/s41283-022-00111-z>
- Goyal, S., Singhal, N., Mishra, N., & Verma, S. K. (2023). The impact of macroeconomics and institutional environment on NPL of developing and developed countries. *Future Business Journal*, 9(1), 45. <https://doi.org/10.1186/s43093-023-00216-1>
- Gujarati, D. M., & Porter, D. C. (2015). *Basic econometrics*. McGraw-Hill Education.
- Islam, M. S., Hossain, M. E., Chakroborty, S., & Ema, N. S. (2021). Does the monetary policy have any short-run and long-run effect on economic growth? A developing and a developed country perspective. *Asian Journal of Economics and Banking*, 6(1), 26-49. <https://doi.org/10.1108/AJEB-02-2021-0014>
- Kiptum, G. K. (2022). Relationship between Kenya's economic growth and inflation. *SN Bus Econ*, 2(189) (2022). <https://doi.org/10.1007/s43546-022-00376-2>



- Klein, N. (2013). *Non-performing loans in CESEE: Determinants and impact on macroeconomic performance*. International Monetary Fund.
- Lee, K., & Werner, R. A. (2018). Reconsidering monetary policy: An empirical examination of the relationship between interest rates and nominal GDP growth in the U. S., U. K., Germany and Japan. *Ecological Economics*, 146, 26-34. <http://dx.doi.org/10.1016/j.ecolecon.2017.08.013>
- Mallik, G., & Chowdhury, A. (2001). Inflation and economic growth: Evidence from four South Asian countries. *Asia-Pacific Development Journal*, 8(1), 123-135.
- Oroud, Y., Almahadin, H. A., Alkhazaleh, M., & Shneikat, B. (2018). Evidence from an emerging market economy on the dynamic connection between financial development and economic growth. *Research in Globalization*, 6, 100124. <https://doi.org/10.1016/j.resglo.2023.100124>
- Razia, A., Omarya, M., Razia, B., Awwad, B. Ruzieh, A. (2023). Examining how unemployment, inflation and their related aspects affected economic growth in Palestine: The period from 1991 to 2020. *Heliyon*, 9, e21081. <https://doi.org/10.1016/j.heliyon.2023.e21081>
- Riyath, M. I. M. (2018). The causal relationship between inflation and economic growth: An empirical study in Sri Lanka. *Asian Journal of Research in Business, Economics, and Management*, 8(1), 21-29. <http://dx.doi.org/10.5958/2249-7307.2018.00003.8>
- Rose, P. S., Marquis, M. H. (2008). *Money and capital market*. McGraw-Hill Irwin.
- Sarel, M. (1996). Nonlinear effects of inflation on economic growth. *IMF Econ Rev*, 43, 199-215. <https://doi.org/10.2307/3867357>
- Shiyalini, S., & Bhavan, T. (2021). Impact of inflation and unemployment on economic growth: The ADRL bound testing approach for Sri Lanka. *Hmlyan Jr Bus Mgn*, 2(1), 55-62. <http://dx.doi.org/10.47310/Hjebm.2021.v02i01.007>
- Skarica, B. (2014). Determinants of non-performing loans in the Central and Eastern European countries. *Finc Theory Pract*, 38(1), 37-59.
- Uddin, I. & Rahaman, K. Ur. (2023). Impact of corruption, unemployment and inflation on economic growth evidence from developing countries. *Quality & Quantity*, 57, 2559-2779. <https://doi.org/10.1007/s11135-022-01481-y>
- Uddin, I. (2021). Impact of inflation on economic growth in Pakistan. *Economic Consultant*, 34(2), 33-41. <https://doi.org/10.46224/ecoc.2021.2.4>