Non-Performing Loans and Economic Growth: A Case of Nepal

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Abstract

This study examines the relationship between non-performing loans and economic growth in the context of Nepal. Gross domestic product and per capita income are the dependent variables. The independent variables are non-performing loans, loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio. This study is based on secondary source of data that are collected from 2015/16 to 2021/22, leading to a total of 105 observations. The data are collected from the Banking and Financial Statistics and bank supervision report published by Nepal Rastra Bank, annual reports of the selected commercial banks and macrotrend.net. The correlation coefficients and regression models are estimated to test the significance and impact of non-performing loans on economic growth of Nepal.

The result showed that non-performing loans have negative impact on gross domestic product and per capita income. It indicates that increase in non-performing loans leads to decrease in gross domestic product and per capita income. Likewise, loan loss provision has a positive impact on gross domestic product and per capita income. It indicates that higher the loan loss provision, higher would be the gross domestic product as well as the per capita income. Moreover, lending interest rate has positive impact on gross domestic product and per capita income. It indicates that higher the lending interest rate, higher would be the gross domestic product as well as the per capita income. In addition, credit to deposit ratio has a positive impact on gross domestic product and per capita income. It indicates that higher the credit to deposit ratio, higher would be the gross domestic product as well as the per capita income.

Keywords: gross domestic product, per capita income, non-performing loans, loan loss provisions, lending interest rate, credit to deposit ratio, leverage ratio

1. Introduction

In reality, the banking sector is seen as the ligament that holds the economy together since it provides credit and allows individuals, firms, and families to save, invest and expand their spending, all of which contribute to economic growth. Lending is the primary business of retail banking and

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non-performing loans (NPLs), have been the focus of attention by European regulators in recent years, as many banks still face difficulties disposing of those that materialized on their balance sheets during the financial crisis (Bellotti *et al*, 2020). NPLs have been found to be affected by macro variables, such as GDP growth, unemployment and inflation, and bank-related variables, such as bad management and market structure (Beck *et al*., 2015; Anastasiou *et al*., 2019). Similarly, Louzis *et al.* (2012) showed that NPLs in the Greek banking system can be explained mainly by macroeconomic variables (GDP, unemployment, interest rates, public debt, and management quality. The academic literature has found that macroeconomic factors are key in determining the level of non-performing loans in an economy (Louzis *et al*., 2012; Beck *et al*., 2015; Ghosh, 2015). Similarly, Staehr and Uuskula (2020) found that many macroeconomic and macro-financial variables are leading indicators for non-performing loans in the EU countries, even years ahead, and higher GDP growth, lower inflation and lower debt are robust leading indicators of a lower ratio of non-performing loans in the future. High stock of nonperforming loans may have detrimental effects on banks, as they typically generate low profits, require high provisions and need large resources to be managed (Aiyar *et al.,* 2015).

Non-performing loan is a bank loan that is subject to late repayment or is unlikely to be repaid by the borrower in full. Loan is the major component of earning assets of stable banking system is a sign of a stable economy which leads towards saving and investment decision trends (Ahmed *et al.,* 2018). Non-performing loans (NPLs) is one of the dangers that maybe break down the banking industry (Leo *et al*., 2019). The NPL has a direct impact on the bank's profitability, liquidity, and equity. The increased NPLs put pressure on the recycling of funds and reduces the ability of banks for lending more and thus results in lesser interest income. Thus, the increased incidence of NPLs not only affects the performance of the banks but also affects the economy as a whole (Pasha and Srivenkataramana, 2014). Similarly, Grigoli *et al*. (2018) revealed that economic contraction was associated with an increase in the ratio of NPLs of banks.

Loan loss provisions is the amount of money that banks must set aside in anticipation of expected credit losses (Ozili, 2018). Loan loss provision (LLP) plays an important role in strengthening the financial position of banks (Olabamiji and Michael, 2018). Similarly, Pelealu and Worang (2017) found that loan loss provision has not significant and positive effect on bank profitability. Likewise, Mustafa *et al*. (2012) found negative and significant

relationship between loan loss provision and profitability of banks. Loan loss provisions (LLP) must be used to cover expected losses. However, due to the discretionary behavior of bank managers, they can become an important tool to pursue goals that are different from a fair representation of the expected evolution of a bank's loan losses. In a situation characterized by an ample fluctuation of the business cycle, provisioning policy can be used to stabilize earnings and dividends (Alessi *et al.,* 2014). Lending interest rates are one of the most important drivers of the economy. For the past decades the debate on interest rate and economic growth has attracted the attention of many researchers in different areas of studies. Decrease in interest rate attracts capital inflows and thus strengthening the local currency (Mishkin, 2010). Similarly, Akinwale (2018) found that decrease in bank lending rate increased economic growth during the study period. Likewise, Ngah *et al*. (2023) found that GDP growth has a significant effect on the lending interest rate. Moreover, Korkmaz *et al*. (2022) GDP is the most influential factor on the lending interest rates at both panel and the country level. The credit to deposit ratio is the ratio of a bank's total loans and total deposits. Capital adequacy ratio reflects a bank's soundness and health to ensure that banks can withstand losses from operating losses (Irawati *et al.*, 2019). Capital must be enough to cover any form of risks encountered, both expected and unexpected losses (Githaiga, 2015). A financial crisis might be brought on by significant banks failing, which would have a negative impact on the overall economy (Ehiedu and Toria, 2021). Good capital adequacy ratio may protect banks from any unforeseen circumstances that may pose a threat to their existence and survival (Balango and Rao, 2017).

Leverage management is very important, because the decision to use high debt can increase company value (Anni'mah *et al.,* 2021; Anggraeni 2019). The ratio used to measure the proportion of funds provided by the company's creditors is called the Leverage Ratio (Rahayu and Sari, 2018). Similarly, Curry (2020) investigated leverage, cash flow, tax, R and D, economic growth and inflation on the financial distress in the sub-sector of property and real estate companies and found that leverage and cash flow are internal factors with adverse influences on the occurrence of financial distress. Likewise, Zeng *et al.* (2022) found that economic growth has a most significant direct impact on the leverage ratio of non-state-owned enterprises. Gross Domestic Product (GDP) is an internationally used measure of an economy's output and performance. It is formally defined as the market value of all final goods and services produced within a country in a given period (Mallett and Keen, 2012). The GDP is a measure of the country's overall economicperformance. If GDP

grows, the likelihood of selling insurance policies also grows andinsurers are likely to benefit from that in forms of higher profits (Suheyli, 2015). It is a measure of financial depth and the overall size of the financial intermediary sector. It is the addition of currency, demand, and interest-bearing liabilities of both banks and non-bank financial institutions (Ehigiamusoe and Lean, 2019). Kajola (2019) examined the relationship of liquidity management on profitability in ten deposit money banks in Nigeria between 2008 and 2017. Using Random effects generalized least squares as estimation technique, the results revealed a positive and statistically significant relationship between two liquidity management proxies (current ratio and liquidity ratio) and return on asset. Bank liquidity and liquidity risk are significant and valid issues as banks should have a well-defined management policy in relation to liquidity. Furthermore, banks must establish liquidity control strategy that indicates specific rules for management of assets, liabilities and liquidity as well (Malik *et al.*, 2016). Maintaining adequate and optimum level of liquidity by banks is dependent on different factors; mainly banks specific and macroeconomic determinants (Al-Harbi, 2020). Bank specific factors include; bank size, capital adequacy, profitability, bank risk, funding cost, quality of assets and others. Macroeconomic determinants of liquidity comprise inflation rate, gross domestic product (GDP), unemployment rate, financial crises periods, and lending rates in addition to other determinants. High proportion of liquid assets held by the bank will directly reduce the funds available for banks to grant loans to the public.

In the context of Nepal, Poudel (2018) found that non-performing loan ratio has a significant negative impact on profitability. Likewise, Gnawali (2018) concluded that total loans to total deposits ratio and loan loss provision have a positive relationship with economic growth. Similarly, Pradhan and Bam (2016) examined the influence of bank Specific and macroeconomic variables on credit risk of commercial banks. The study concluded that capital adequacy ratio is a major determinant of credit risk in the context of Nepalese commercial banks. In addition, Pradhan and Shrestha (2016) examined the impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. The study showed that bank operating efficiency, loan ratio, total deposit to total assets, loan loss provision to total equity have significantly positive impact on financial performance of commercial banks. Similarly, the study also found that loan loss provision to total loan, core capital ratio, risk weighted ratio, and total capital ratio have negative impact on financial performance of Nepalese commercial banks. Further, Pachhaldangaya and Bista (2023) examined the impact of macro-

economic factors on the credit risk of Nepalese commercial banks and found that higher interest rate leads to decrease in non-performing loan and loan loss provision. Likewise, Shrestha (2014) found that return on assets, return on equity, net interest margin and capital adequacy ratio have significant positive relation with non-performing loans. Further, Neupane (2019) analyzed the factors influencing profitability in Nepalese commercial banks. The study revealed that capital adequacy ratio, credit risk, GDP and inflation have an insignificant effect on Nepalese commercial bank profitability

The above discussion showed that there is no consistency in the findings of various studies concerning the impact of non-performing loans on economic growth.

The major objective of this study is to examine the impact of non-performing loans in economic growth of Nepal. More specifically, it examines the effect of non-performing loans, loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio on gross domestic product and per capita income of Nepal.

The reminder of this study is organised as follows: section two describes the sample, data and methodology. Section three presents the empirical results and final section draws the conclusion and discuss the implication of the study findings.

2. Methodological aspects

The study is based on secondary data which are gathered from 15 commercial banks inNepal for the period of 7 years from 2015/16 to 2021/22. The data are collected from the Banking and Financial Statistics and bank supervision report published by Nepal Rastra Bank, annual reports of the selected commercial banks and macrotrend.net. The study is based on descriptive as well as casual comparative research design. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

List of banks selected for the study along with the study period andnumber of observations

S.N.	Name of commercial banks	Study period	Observations
1	Nepal Bank Limited	2015/16-2021/22	7
2	Agricultural Development Bank Limited	2015/16-2021/22	7
3	Rastriya Banijya Bank Limited	2015/16-2021/22	7
4	NMB Bank Limited	2015/16-2021/22	7
5	Everest Bank Limited	2015/16-2021/22	7
6	NIC Asia Bank Limited	2015/16-2021/22	7
7	Machhapuchchhre Bank Limited	2015/16-2021/22	7
8	Sanima Bank Limited	2015/16-2021/22	7
9	Sunrise Bank Limited	2015/16-2021/22	7
10	Prime Commercial Bank Limited	2015/16-2021/22	7
11	Siddhartha Bank Limited	2015/16-2021/22	7
12	Nepal SBI Bank Limited	2015/16-2021/22	7
13	Citizens Bank International Limited	2015/16-2021/22	7
14	Laxmi Bank Limited	2015/16-2021/22	7
15	Standard Chartered Bank Nepal Limited	2015/16-2021/22	7
Total number of observations			**105**

Thus, the study is based on the 105 observations.

The model

The model used in this study assumes that gross domestic product and per capita income depend on various banking variables. The independent variables are non-performing loans, loan loss provision, lending interest rates, credit to deposit ratio, capital adequacy ratio and leverage ratio. Therefore, the model takes the following form:

Economic growth = f (NPL, LLP, LIR, CDR, CAR and LEV)

More specifically, the given model has been segmented into following models:

$$GDP_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 LLP_{it} + \beta_3 LIR_{it} + \beta_4 CDR_{it} + \beta_5 CAR_{it} + \beta_6 LEV_{it} + e_{it}$$

$$PCI_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 LLP_{it} + \beta_3 LIR_{it} + \beta_4 CDR_{it} + \beta_5 CAR_{it} + \beta_6 LEV_{it} + e_{it}$$

Where,

GDP = Gross domestic product as measured by real gross domestic product,

USD in Billion.

PCI = Per capita income as measured by average income earned per person, in USD.

NPL= Non-performing loan is measured by non-performing loan to total loan, inpercentage.

LLP= Loan loss provision is measured by loan loss provision to total loans, inpercentage.

LIR= Lending interest rate is measured by weighted average interest income to total loans, in percentage

CDR= Credit to deposit ratio as measured by the ratio of bank's total loans to its totaldeposits for the same period, in times.

CAR= Capital adequacy ratio as measured by the ratio of equity to total assets, in percentage.

LEV= Leverage ratio is defined as the total debt to total assets, in percentage.

The following section describes the independent variables used in this study along with the hypothesis formulation.

Non-performing loan

Pervez and Bansal (2019) found a significant negative relationship between non-performing assets and NIM in the Indian banking industry. Likewise, Singh (2015); Dawn (2018) found a negative impact of non-performing loan on bank performance. Similarly, Alshebmi *et al.* (2020) found a negative insignificant relationship between non-performing loans ratio (NPLs) and economic growth. Espinoza and Prasad (2010) also found that a high NPL ratio will lower economic growth and that a high NPL in the future can be caused by a high credit growth in the past. Similarly, Warue (2013) found an inverse relationship among growth in real GDP and NPL. Based on it, this study develops the following hypothesis:

H_1: There is a negative relationship between non-performing loans and economic growth.

Loan loss provision

Abbas and Hussain (2021) found positive relationship between bank risk proxy (LLP) and GDP. Similarly, Alhadab and Alsahawneh (2016) found that loan loss provision has a negative impact on the profitability of Jordanian commercial banks. Ernest and Fredrick (2017) showed that non-performing loans ratio and loan loss provisions ratio have a significant negative impact on the commercial banks' profitability. **S**imilarly, Ren *et al*. (2023) Negative relationship between economic growth target pressure and loan loss provisions. Also, Isa *et al.* (2018) concluded that there is a negative relationship between the gross domestic product and loan loss provisions. Based on it, this study develops the following hypothesis:

H_2: There is a negative relation with between loan loss provision and economic growth.

Lending Interest rate

Obamuyi (2009) found that real lending rates have significant effect on economic growth. Similarly, Lee and Werner (2018) found that interest rates follow GDP growth and are consistently positively correlated with growth. Likewise, Korkmaz *et al*. (2022) found GDP has significant impact on lending interest rate. Moreover, Ngah *et al*. (2023) found GDP growth has significant impact on lending interest rate. Further, Bhattarai (2015) revealed that lending interest rate has positive impact on profitability of banks. Based on it, this study develops the following hypothesis:

H_3: There is a positive relationship between interest rate and economic growth.

Credit to deposit ratio

Okoye *et al.* (2017) found that loans to deposit ratio have non- significant positive effect on economic growth. Similarly, Dame and Tessema (2022) found that the three internal variables such as loan to deposit ratio, profitability and the number of bank branches and two macroeconomic variables such as unemployment rate and economic growth rate have a significant effect on the total deposit of private commercial banks. Likewise, Nwafor and Yomi (2018) found that there is a strong positive relationship between the loan to deposit ratio and the dependent variable economic growth. Moreover, Guru and Yadav (2019) found a significant positive relationship between credit to deposit ratio and economic growth. Moreover, Dao and Nguyen (2020)

revealed a significant relationship between GDP growth and equity to deposit. Based on it, this study develops the following hypothesis:

H_4: There is a positive relationship between credit to deposit ratio and economic growth.

Capital adequacy ratio

Yüksel and Özsarı (2017) found that CAR and economic growth rate are negatively related. Similarly, Dao and Nguyen (2020) revealed a statistically significant relationship between CAR and GDP growth. Likewise, Naoaj (2023) found a positive correlation between real GDP and net profit and capital adequacy. Moreover, El-Ansary *et al.* (2019) found a significant association between CAR and GDP growth rate. Likewise, Nguyen (2020) found a significant positive relationship between CAR and GDP growth rate. Based on it, this study develops the following hypothesis:

H_5: There is a positive relationship between capital adequacy ratio and economic development.

Leverage ratio

Ijirshar *et al*. (2016) found a significant relationship between external debt and economic growth. Similarly, Wang and Mirza (2017) found GDP (gross domestic product) has a positive impact of firm leverage policy. Likewise, Zhao *et al*. (2020) revealed financial leverage reacts positively and significantly on economic growth. Moreover, Zeng *et al.* (2022) found that economic growth has the most significant direct impact on the leverage ratio of non-state-owned enterprises. Likewise, Hidayat and Dewi (2023) found that Leverage proxies by the debt to assets ratio significantly affects profitability. Based on it, this study develops the following hypothesis:

$H_{6:}$ There is a positive relationship between leverage and economic growth.

3. Results and discussion

Descriptive statistics

Table 2 present the descriptive statistics of the selected dependent variables and independent variables for the period from 2015/16 to 2021/22.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banksfor the study period of 2015/16 to 2021/22. Dependent variables are GDP (Gross domestic product as measured by real gross domestic product, USD in Billion) and PCI (Per capita income as measured by average income earnedper person, in USD). The independent variables are NPL(Non-performing loan is measured by non-performing loanto total loan, in percentage), LLP (Loan loss provision is measured by loan loss provision to total loans, in percentage), LIR (Interest rate measured as the ratio of interest income from loans and advances to total loans and advances, in percentage),CDR (Credit to deposit ratio as measured by the ratio of bank's total loans to its total deposits for the same period, in times), CAR (Capital adequacy as measured by the ratio of tier1 capital plus tier 2 capital to risk weighted assets in percentage)),and LEV (Leverage ratio as measured by the total debt to total equity, in times).

Variables	Minimum	Maximum	Mean	S.D.
GDP	24.36	36.29	30.70	4.46
PCI	880	1208	1069.29	130.97
NPL	0.01	4.75	1.30	1.19
LLP	0.09	5	2.13	0.99
LIR	7.44	16.57	10.88	1.84
CDR	0.48	1.09	0.86	0.10
CAR	10.2	22.99	14.06	2.40
LEV	4.12	15.56	8.07	2.29

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the result are presented in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficient dependent and independent variables of 15 Nepalese commercial banks for the study period of 2015/16 to 2021/22. Dependent variables are GDP (Gross domestic product as measured by real gross domestic product, USD in Billion) and PCI (Per capita income as measured by average income earned per person, in USD). The independent variables are NPL(Non-performing loan is measured by non-performing loanto total loan, in percentage), LLP(Loan loss provision is measured by loan loss provision to total loans, in percentage), LIR (Interest rate measured as the ratio of interest income from loans and advances to total loans and advances, in percentage),CDR (Credit to deposit ratio as measured by the ratio of bank's total loans to its total deposits for the same period, in times), CAR (Capital adequacy as measured by the ratio of tier1 capital

plus tier 2 capital to risk weighted assets in percentage) and LEV (Leverage ratio as measured by the total debt to total loans, in times).

Variables	GDP	PCI	NPL	LLP	LIR	CDR	CAR	LEV
GDP	1							
PCI	0.993**	1						
NPL	-0.069	-0.066	1					
LLP	0.028	0.013	0.902**	1				
LIR	0.294**	0.341**	0.013	-0.168	1			
CDR	0.413**	0.400**	-0.217*	-0.16	0.164	1		
CAR	0.085	0.097	0.062	0.047	0.363**	-0.077	1	
LEV	0.115	0.097	-0.179	-0.145	-0.248*	-0.097	-0.579**	1

Note: The asterisk sign (**) and (*) indicate that the results are significant at one percent and five percent levels.

Table 3 shows that non-performing loan is negatively correlated to both gross domestic product and per capita income. It indicates that increase in non-performing loans leads to decrease in gross domestic product and per capita income. Likewise, loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio are positively correlated to gross domestic product and per capita income. It indicates that increase in loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio lead to increase in both gross domestic product and per capita income.

Regression analysis

Having indicated the Pearson's correlation coefficient's the regression analysis has been carried out and the results are presented in Table 4. More specifically, it shows the regression result of non-performing loans, loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio on gross domestic product of Nepal.

Table 4

Estimated regression results of non-performing loan, loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio on gross domestic product

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2015/16-2021/22 by using the linear regression model and the model is $GDP_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 LLP_{it} + \beta_3 LIR_{it} + \beta_4 CDR_{it} + \beta_5 CAR_{it} + \beta_6 LEV_{it} + e_{it}$ where, the dependent variable is GDP (Gross domestic product as measured by real gross domestic product, USD in Billion). The independent variables are NPL(Non-performing loan is measured by non- performing

loan to total loan, in percentage), LLP(Loan loss provision is measured by loan loss provision to total loans, in percentage),LIR(lending Interest rate measured as the ratio of total interest income from total loans in percentage),CDR(Credit to deposit ratio as measured by the ratio of bank's total loans to its total deposits for the same period, percentage), CAR(Capital adequacy as measured by the ratio of tier1 capital plus tier 2 capital to risk weighted assets in percentage)),and LEV(Leverage ratio as measured by the total debt to total loans, in times).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		NPL	LLP	LIR	CDR	CAR	LEV			
1	31.033 (47.714) **	-0.259 (0.364)						0.005	4.473	0.490
2	30.431 (29.251) **		0.124 (0.280)					0.009	4.482	0.078
3	22.938 (9.106) **			0.713 (3.123)**				0.078	4.286	9.753
4	13.936 (3.666) **				19.382 (4.598)**			0.162	4.084	21.146
5	28.483 (10.962)**					0.157 (0.864)		0.002	4.468	0.747
6	28.887 (18.017) **						0.225 (1.179)	0.004	4.454	1.391
7	28.554 (21.606) **	-1.896 (2.205)*	2.170 (2.153)*					0.029	4.396	2.572
8	14.097 (4.343)**	-3.431 (4.139)**	4.175 (4.151)**	1.119 (4.789)**				0.201	3.989	9.727
9	3.534 (0.840)	-2.696 (3.338)**	3.552 (3.685)**	0.930 (4.102)**	15.031 (3.663)**			0.289	3.764	11.547
10	4.035 (0.888)	-2.735 (3.329)**	3.607 (3.661)**	0.961 (3.837)**	14.815 (3.541)**	-0.051 (0.301)		0.282	3.781	9.172
11	-9.574 (1.650)	-2.356 (2.996)**	3.472 (3.664)**	0.944 (3.977)**	17.963 (4.418)**	0.333 (1.706)	0.688 (3.497)**	0.355	3.583	10.584

Notes:

i. Figures in parenthesis are t-values.
ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and fivepercent level respectively.
iii. GDP is the dependent variable

Table 4 shows that the beta coefficients of non-performing loans are negative with gross domestic product. It indicates that non-performing loan has a negative impact on gross domestic product. This finding is consistent with the findings of Alshebmi *et al.* (2020). Similarly, the beta coefficients for loan loss provision are positive with gross domestic product. It indicates that loan loss provision has a positive impact on gross domestic product. This finding is similar to the findings of Ngah *et al*. (2023). Furthermore, the beta coefficients for lending interest rate are positive with gross domestic product. It indicates that lending interest rate has a positive impact on gross domestic product. This finding is consistent with the findings of Korkmaz *et al*. (2022). Likewise, the beta coefficients for credit to deposit are positive with gross domestic product. It indicates credit to deposit has a positive impact on gross domestic product. This finding is similar to the findings of Nwafor and Yomi (2018). In addition, the beta coefficients of capital adequacy ratio are positive with gross domestic product. It indicates that capital adequacy ratio has a

positive impact on gross domestic product. This finding is consistent with the findings of Naoaj (2023).

Table 5 shows the estimated regression results of non-performing loan, loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio on PCI (per capita income) of Nepalese commercial banks.

Table 5

Estimated regression results of non-performing loan, loan loss provision, lending interest rate, credit to deposit ratio and deposit ratio on per capita income

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2015/16-2021/22by using the linear regression model and the model is $PCI_{it} = \beta_0 + \beta_1 NPL_{it} + \beta_2 LLP_{it} + \beta_3 LIR_{it} + \beta_4 CDR_{it} + \beta_5 CAR_{it} + \beta_6 LEV_{it} + e_{it}$ where, the dependent variable is PCI (Per capita income as measured by average income earned per person, in USD). The independent variables are NPL (Non-performing loan is measured by non- performing loan to total loan, in percentage), LLP (Loan loss provision is measured by loan loss provision to total loans, in percentage),LIR(lending Interest rate measured as the ratio of total interest income from total loans in percentage),CDR (Credit to deposit ratio as measured by the ratio of bank's total loans to its total deposits for the same period, percentage), CAR (Capital adequacy as measured by the ratio of tier1 capital plus tier 2 capital to risk weighted assets in percentage)),and LEV(Leverage ratio as measured by the total debt to total loans, in times).

Model	Intercepts	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		LEV	DPS	DPR	ROA	ROE	LDR			
1	713.779 (4.460)**	-6.297 (3.373)**						0.093	121.805	11.377
2	163.518 (10.784)**		1.965 (1.413)					0.010	127.283	1.997
3	168.475 (10.623)**			0.273 (0.732)				0.005	128.205	0.536
4	132.164 (3.295)**				27.745 (1.137)			0.003	127.725	1.292
5	222.022 (6.271)**					-3.345 (1.408)		0.010	127.292	1.983
6	313.359 (1.699)						-1.597 (0.749)	0.004	128.188	0.562
7	703.732 (4.421)**	-6.322 (3.408)**	2.005 (1.516)					0.105	121.022	6.912
8	734.853 (4.603)**	-6.616 (3.567)**	5.523 (2.023)*	1.071 (1.471)				0.115	120.317	5.383
9	722.463 (4.236)**	-6.575 (3.509)**	5.216 (1.685)	0.992 (1.209)	5.611 (0.214)			0.106	120.907	4.010
10	677.967 (3.844)**	-5.806 (2.862)**	5.448 (1.755)	1.030 (1.255)	15.101 (0.541)	-2.624 (0.991)		0.106	120.919	3.403
11	976.194 (2.996)**	-6.594 (3.064)**	4.282 (1.305)	0.835 (0.994)	10.219 (0.362)	-2.389 (0.900)	-2.598 (1.088)	0.108	120.803	3.039

Notes:

i. Figures in parenthesis are t-values.
ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percentlevel respectively.
iii. Per capita income is the dependent variable

Table 5 shows that the beta coefficients for non-performing loans are negative with per capita income. It indicates that non-performing loan has a negative impact on per capita income. This finding is consistent with the findings of Bonfim (2009). Likewise, the beta coefficients for loan loss provision are positive with per capita income. It indicates that loan loss provision has a positive impact on per capita income. This finding is similar to the findings of Messai and Jouini (2013). Furthermore, the beta coefficients for lending interest rate are positive with per capita income. It indicates that lending interest rate has a positive impact on per capita income. This finding is consistent with the findings of Anyanwu *et al*. (2017). Similarly, the beta coefficients for creditto deposit are positive with per capita income. It indicates credit to deposit has a positive impact on per capita income. This finding is similar to the findings of Okoye *et al*. (2017). Likewise, the beta coefficients for capital adequacy ratio are positive with per capita income which indicates that capital adequacy ratio has a positive impact on per capita income. This finding is consistent with the findings of Dao and Nguyen (2020).

4. Summary and conclusion

Loan is the major component of earning assets of commercial banks. However, the profitability will be more if the bank has less non-performing loan. On the other hand, if the non-performing loan is high, the banks may not be able reap profit. Instead, they may be in loss because the banks need to put reserves for the amount of non-performing loans. When non-performing loan are retained permanently, this will have negative impact on the profitability of banks. Non- performing loans are likely to hamper economic growth and reduce the economic efficiency. The shock to the financial system can arise from specific variables of the economy or from macroeconomic imbalances. The minimization of non-performing loan is necessary to improve the economic growth.

This study attempts to examine the impact of non-performing loan on economic growth of Nepal. The study is based on 7 years of data from 2015/16 to 2021/22 with 105 observations collected from 15 Nepalese commercial banks.

The study showed that loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio have positive impact on the gross domestic product and per capita income. However, non-performing loan has negative impact on the gross domestic product and per capita income. The study concluded that increase in non- performing loan has insignificant impact on the economic growth of Nepal. Likewise, the study

also concluded that loan loss provision, lending interest rate, credit to deposit ratio, capital adequacy ratio and leverage ratio is the most influencing factor that explains the changes in economic growth of Nepal.

References

Abbas, M. A., and I. Hussain, 2021. Effect of monetary policy and selected macroeconomic variables on risk taking appetite and performance of banking sector of Pakistan. *GMJACS* 11(1), 18-27.

Ahmed, A., R. Rehan, I. U Chhapra, and S. Supro, 2018. Interest rate and financial performance of banks in Pakistan. *International Journal of Applied Economics, Finance Accounting* 2(1), 1-7.

Aiyar, S., W. Bergthaler, J. M. Garrido, A. Ilyina, A. Jobst, K. Kang, D. Kovtun, Y. Liu, D. Monaghan, and M. Moretti, 2015. Strategy for resolving Europe's problem loans. *Journal of Banking* 5(2), 25-38.

Akinwale, S. O., 2018. Bank lending rate and economic growth: Evidence from Nigeria. *International Journal of Academic Research in Economics and Management Sciences* 7(3), 111-122.

Alessi, M., S. D. Colli and J. S. Lopez, 2014. Loan loss provisioning and relationship banking in Italy: practices and empirical evidence. *Journal of Entrepreneurial and Organizational Diversity* 3(1), 111-129.

Alhadab, M., and S. Alsahawneh, 2016. Loan loss provision and the profitability of commercial banks: Evidence from Jordan. *International Journal of Business and Management* 11(12), 242-248.

Al-Harbi, A., 2020. Determinates of Islamic banks liquidity. *Journal of Islamic Accounting and Business Research* 11 (8), 1619-1632.

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

Anastasiou, D., H. Louri, and M. Tsionas, 2019. Non-performing loans in the Euro-area: are core-periphery banking markets fragmented. *International Journal of Finance* 24 (1), 97–112.

Anggraeni, M. D. H., and S. Muhammad, 2020. The effect of profitability, liquidity, and leverage on company value with dividend policy as a moderating variable. *Journal of Management and Applied Accounting (JIMAT)* 11(1), 1-21.

Anni'mah, H. F., S. Ali, and, S. Susanti, 2021. The effect of leverage, liquidity, profitability on the value of the SMC JCI. *Journal of Accounting, Taxation*

and Audit (JAPA) 2(2), 1-16.

Anyanwu, F., A. Ananwude, and N. Okoye, 2017. An empirical assessment of the impact of commercial banks' lending on economic development of Nigeria. *International Journal of Applied Economics, Finance and Accounting* 1(1), 14-29.

Balango, T. K., and M. K. Rao, 2017. Effect of non-performing loan on profitability of banks with reference to commercial bank of Ethiopia. *Business and Management Research Journal* 7(1), 45-50.

Beck, R., P. Jakubik, and A. Piloiu, 2015. Key determinants of non-performing loans: new evidence from a global sample. *Open Econ. Rev.* 26(3), 525–550.

Bellotti, A., D. Brigo, P. Gambetti, and F. Vrins, 2021. Forecasting recovery rates on non-performing loans with machine learning. *International Journal of Forecasting* 37(1), 428-444.

Bhattarai, Y. R., 2015. Determinants of lending interest rates of Nepalese commercial banks. *Economic Journal of Development Issues* 19(2), 39-59.

Bonfim, D., 2009. Credit risk drivers: Evaluating the contribution of firm level information and of macroeconomic dynamics. *Journal of Banking and Finance* 33(2), 281-299.

Curry, K., 2020. The influence of leverage, cash flow, tax, economic growth and inflation on the financial distress in the sub-sector of property and real estate companies. *International Journal of Management, Accounting, and Economy* 151(1), 397-400.

Dame Tafa, M., and S. Tessema Worku, 2022. Determinants of private commercial banks deposit in Ethiopia. *Cogent Economics and Finance* 10(1), 1-15.

Dao, B. T. T., and K. A. Nguyen, 2020. Bank capital adequacy ratio and bank performance in Vietnam: A simultaneous equations framework. *The Journal of Asian Finance, Economics and Business* 7(6), 39-46.

Dawn, S., 2018. Non-Performing Assets (NPAs): A study of Uco Bank. *Epra International Journal of Economic and Business Review Non-Performing* 36(1), 88-92.

Ehiedu, V. C., and G. Toria, 2021. Audit indicators and financial performance of manufacturing Firms in Nigeria. *Linguistics and Culture Review* 6(1), 14-41.

Ehigiamusoe, K. U., and H. H. Lean, 2019. Effects of energy consumption, economic growth, and financial development on carbon emissions: evidence from heterogeneous income groups. *Environmental Science and Pollution Research* 26(22), 22611-22624.

El-Ansary, O., A. A. El-Masry, and Z. Yousry, 2019. Determinants of capital adequacy ratio (CAR) in MENA region: Islamic vs. conventional banks. *International Journal of Accounting and Financial Reporting* 9(2), 287-313.

Ernest, S. A., and S. O. Fredrick, 2017. Impact of credit risk management on the profitability of selected commercial banks listed on the Ghana stock exchange. *Journal of Economics, Management and Trade* 20(2), 1-10.

Espinoza, M. R. A., and A. Prasad, 2010. Non-performing loans in the GCC banking system and their macroeconomic effects. *International Monetary Fund.* 1(1), 3-24.

Ghosh, A. ,2015. Banking-industry specific and regional economic determinants of nonperforming loans: Evidence from US states. *Journal of Financial Stability* 20(1), 93-104.

Githaiga, J. W., 2015. Effects of credit risk management on the financial performance of commercial banks in Kenya. *Master Bus Adm Univ Nairobi* 8(1), 91-105.

Gnawali, A., 2018. Non-performing asset and its effects on profitability of Nepalese commercial banks. *International Journal of Research in Business Studies and Management*. 5(9), 39-47.

Grigoli, F., M. Mansilla, and M. Saldías, 2018. Macro-financial linkages and heterogeneous non-performing loans projections. *Journal of Banking and Finance* 97(1), 130–141.

Guru, B. K., and I. S. Yadav, 2019. Financial development and economic growth: panel evidence from BRICS. *Journal of Economics, Finance and Administrative Science* 24(47), 113-126.

Hidayat, I., and F. O. S. Dewi, 2023. The effect of liquidity, leverage, and working capital turn on profitability. *APTISI Transactions on Management (ATM)* 7(1), 60-68.

Ijirshar, V. U., F. Joseph, and M. Godoo, 2016. The relationship between external debt and economic growth in Nigeria. *International Journal of Economics and Management Sciences* 6(1), 1-5.

Irawati, N., A. Maksum, I. Sadalia, and I. Muda, 2019. Financial performance of Indonesian banking industry: The role of good corporate governance, capital adequacy ratio, nonperforming loan, and size. *International Journal of Scientific and Technology Research* 8(4), 22-26.

Isa, M. Y. M., Y. V. Choong, D. Y. G. Fie, and M. Z. H. A. Rashid, 2018. Determinants of loan loss provisions of commercial banks in Malaysia. *Journal of Financial Reporting and Accounting* 16(1), 24-48.

Kajola, S. O., W.A. Sanyaolu, A. Alao, and O. J. Ojunrongbe, 2019. Liquidity and

profitability dynamics: Evidence from the Nigerian banking sector. *Accounting and Taxation Review* 3(2), 1-12.

Korkmaz, Ö., M. T. Kartal, and F. Ayhan, 2022. The effects of macroeconomic indicators on lending interest rates. *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi* 25(2), 682-693.

Lee, K. S., and R. A. Werner, 2018. Reconsidering monetary policy: An empirical examination of the relationship between interest rates and nominal GDP growth in the US, UK, Germany and Japan. *Ecological Economics* 146(1), 26-34.

Leo, M., S. Sharma, and K. Maddulety, 2019. Machine learning in banking risk management: A literature review. *Risks* 7(1), 30-50.

Louzis, D., A. Vouldis, and V. Metaxas, 2012. Macroeconomic and bank-specific determinants of nonperforming loans in Greece: A comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking and Finance* 36(4), 1012-1027.

Malik, M. S., M. Awais, and A. Khursheed, 2016. Impact of liquidity on profitability: A comprehensive case of Pakistan's private banking sector. *International Journal of Economics and Finance* 8(3), 69-74.

Mallett, J., and C. Keen, 2012. Does GDP measure growth in the economy or simply growth in the money supply? *Journal of Economics* 3(1), 21-32.

Messai, A. S., and F. Jouini, 2013. Micro and macro determinants of non-performing loans. *International journal of economics and financial issues* 3(4), 852-860.

Mishkin, F. S., 2010. Monetary policy flexibility, risk management, and financial disruptions. *Journal of Asian Economics* 21(3), 242-246.

Mustafa, A. R., R. H., Ansari, and M. U. Younis, 2012. Does the loan loss provision affect the banking profitability in case of Pakistan? *Asian Economic and Financial Review* 2(7), 772-783.

Naoaj, M. S., 2023. Exploring the determinants of capital adequacy in commercial banks: A Study of Bangladesh's Banking Sector. *European Journal of Business and Management Research* 8(2), 108-112.

Neupane, M. G., 2019. Factors influencing profitability in Nepalese commercial banks. *The Lumbini Journal of Business and Economics* 7(1), 79-88.

Ngah, N. N., S. F. S. Mohamad, W. Wahab, M. M. Yusuf, and M. F. A. Khir, 2023. Analysis of lending interest rate and economic activities in Malaysia. *Journal of Economics* 5(1), 81-93.

Nguyen, T. H., 2020. Impact of bank capital adequacy on bank profitability

under Basel ii accord: An evidence from Vietnam. *Journal of Economic Development* 45(1), 31-46.

Nwafor, M., and A. Yomi, 2018. The nexus between financial inclusion and economic growth: Evidence from Nigeria. *International Journal of Research and Innovation in Social Sciences* 2(4), 143-149.

Obamuyi, T. M., 2009. An investigation of the relationship between interest rates and economic growth in Nigeria, 1970-2006. *Journal of economics and International Finance* 1(4), 93-98.

Okoye, L. U., K. A. Adetiloye, O. Erin, and N. Modebe, 2017. Financial inclusion as a strategy for enhanced economic growth and development. *Journal of International Banking and Commerce* 22(8), 1-12.

Olabamiji, O., and O. Michael, 2018. Credit management practices and bank performance: Evidence from First Bank. *South Asian Journal of Social Studies and Economics* 1(1), 1-10.

Ozili, P. K., 2018. Bank loan loss provisions, investor protection and the macroeconomic indicators. *International Journal of Emerging Markets* 13(1), 45-65.

Pachhaldangaya, S., and N. B. Bista, 2023. Impact of macroeconomic factors on credit risk of Nepalese commercial banks. *Perspectives in Nepalese Management* 1(1), 443-456.

Pasha, M. A., and T. Srivenkataramana, 2014. Non-Performing assets of Indian commercial banks: A critical evaluation. *Dharana* 8(1), 03–10.

Pelealu, I. W., and F. G. Worang, 2017. Analysis the effect of loan loss provision on bank profitability. *Journal Rise economic Management, Business* 6(4), 3278-3287.

Pervez, A., and R. Bansal, 2019. Capital adequacy, risk and bank performance: Evidence from India. *Journal of Xi'an University of Architecture and Technology* 9(7), 199-212.

Poudel, S. R., 2018. Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research* 3(6), 161-170.

Pradhan, R. S., and B. Bam, 2016. Influence of bank-specific and macroeconomic variables on credit risk: A case of Nepalese commercial banks. *E-Journal SSR,* 2(1), 1-16.

Pradhan, R. S., and D. Shrestha, 2017. Impact of liquidity on bank profitability in Nepalese commercial banks. *SSRN Electronic Journal* 1(1), 1-14.

Rahayu, M., and B. Sari, 2018. Kepemilikan institusional, manajemen laba dan

leverage terhadap. *Kinerja Perusahaan Agregat* 2(1), 67–78.

Ren, M., K. Ke, X. Yu, and J. Zhao, 2023. Local governments' economic growth target pressure and bank loan loss provision: Evidence from China. *International Review of Economics and Finance* 87(1), 1-14.

Shrestha, D., 2014. The relationship between risk and capital in commercial banks. *Journal of Banking and Finance* 16(2), 439-457.

Singh, A., 2015. Performance of credit risk management in Indian commercial banks. *International Journal of Management and Business Research* 5(3), 169-188.

Singh, S. K., B. Basuki, and R. Setiawan, 2021. The effect of non-performing loan on profitability: Empirical evidence from Nepalese commercial banks. *The Journal of Asian Finance, Economics and Business* 8(4), 709-716.

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

Suheyli, R., 2015. Determinants of profitability on insurance companies in Ethiopia. *Journal of Finance* 1(1), 1-18.

Wang, M., and S. S. Mirza, 2017. How do Chinese firms adjust their financial leverage: an empirical investigation using multiple GMM models? *China Finance and Economic Review* 5(1), 1-30.

Warue, B. N., 2013. The effects of bank specific and macroeconomic factors on nonperforming loans in commercial banks in Kenya: A comparative panel data analysis. *Advances in Management and Applied Economics* 3(2), 135-164.

Yüksel, S., and M. Özsarı, 2017. Influencing factors of Capital Adequacy Ratio of the deposit banks: A panel regression analysis for Turkish banking sector. *Internacional Conference in Economics Da Econworld* 6(1), 1-9.

Zeng, S., F. Li, and Z. Zhong, 2022. Research on Influencing Factors of the Leverage Ratio of Non-financial Enterprises in the GBA. *Journal of Applied Finance and Banking* 12(1), 141-168.

Zhao, M., R. Yang, and Y. Li, 2020. Financial leverage, economic growth and environmental degradation: Evidence from 30 Provinces in China. *Journal of Economics* 3(1), 22-34.