International Journal of Finance and Commerce
www.commercejournals.com
Online ISSN: 2664-715X, Print ISSN: 2664-7141
Received: 27-02-2023, Accepted: 14-03-2023, Published: 31-03-2023
Volume 5, Issue 1, 2023, Page No. 109-116

Determinants of commercial banks' lending in Nepal

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Abstract
This study aims to identify the effect of macroeconomic variables, industry-specific variables, and bank-specific variables on Nepalese commercial banks' lending. The data were collected from 15 commercial banks for a period of 10 years from year 2011 to year 2020, using convenience sampling techniques. Here banks' lending is measured in terms of total loan and advances of bank. The study uses GDP, inflation rate, and foreign exchange rates as macroeconomic variables; CRR, CAR, and lending interest rate as industry-specific variables; total deposit, profitability, liquidity, and bank size as bank-specific variables. The result from random effect panel regression analysis shows that bank size, total deposit, return on assets, and exchange rate have significant positive effect on loans and advances. The rate of inflation and the liquidity ratio have a significant negative impact on loans and advances. GDP, CRR, and CAR have a negative but insignificant impact on loans and advances, which is unexpected. Also, the lending interest rate has a positive and insignificant impact on loans and advances. The study suggests that commercial banks should focus on bank-specific and macroeconomic factors and mobilize them in a way that will enhance their lending performance and should formulate critical, realistic, and comprehensive strategic and financial plans.

Keywords: commercial banks, bank lending, macroeconomic, bank specific, industry specific

Introduction

Lending is the primary role in commercial banks' daily banking activities and is described as the heart of a commercial bank's banking business. On the other hand, it is also one of the greatest sources of risk to the safety and soundness of financial institutions (Yitayaw, 2021) [49].Commercial banks are significant in the overall performance of an economy and act as a financial intermediary. Commercial banks have been at the center of driving the economy, as evidenced by the tremendous growth in private sector credit over time (Olokoyo, 2011) [41]. According to Jamil (1988) and Beck *et al*. (2004) [8], if bank credit is not available, the expansion of productive investments in manufacturing, agriculture, real estate development, distribution, fishing, trade, tourism, etc., would in many cases be impossible.

Commercial banking, especially lending, is by its nature highly prone to unpredictability, arising from different bank-specific, regulatory, and macroeconomic factors. Furthermore, Ezirim (2005) [11] stated that bank lending decisions are fraught with a lot of risks, which require a great deal of caution and tact in this aspect of banking operations since the major risk of the banking business lies in the credit function, where there is a high possibility of default. Therefore, the study of the determinants of banks' lending behavior is very crucial for banks to make a more sustainable profit from their credit portfolio.

Credit usually represents the bulk of the institution's assets, while interest on the credit represents the major source of income. Loans involve a high degree of risk and have a profound impact on the bank's profitability, liquidity, and solvency. The quality of a bank's credit points to the soundness and stability of the bank and the risk borne by the depositors and creditors. Poor management of loan portfolios is the major cause of liquidity crises and bank failures around the world. Although credit growth can spur investment and economic activity, excessive growth in credit can impact the stability of the financial system by increasing prudential risks at the micro and macro levels (Igan&Pinheiro, 2011) [14].

Many studies on the cause of bank failures find that asset quality is a statistically significant predictor of insolvency and that failing banking institutions always have a high level of non-performing loans prior to failure (Barr &Siems, 1994) [7]. In the context of Nepal, there are fewer previous studies done about banks' lending behavior in comparison to other countries. Hence, this study aims to add further knowledge regarding banks' lending behavior by considering various explanatory variables that were not considered in a previous study in Nepal. This study examines the factors influencing commercial bank loans and advances in Nepal, including macroeconomic variables (GDP, inflation, and exchange rate), industry-specific variables (CRR, CAR, and average lending rate), and bank-specific variables (total deposit, liquidity ratio, bank size, and profitability).The major objective of this study is to examine the relationship and effect of macroeconomic, industry specific, bank specific determinants on lending behavior of Nepalese commercial banks.

Review of literature

Lending is the core function of commercial banks, which is evidenced by the volume of loans that constitute banks' assets portfolio and the considerable annual increase in loans that are granted to borrowers in both the private and public sectors of the economy (Abdul Adzis *et al*., 2018) [1]. Adedoyin andSobodun (1991) [2] stated,"lending is undoubtedly the heart of the banking business." As a result, its management necessitates considerable skill and dexterity on the part of the bank's management." The lending activity is only possible if the banks can mobilize enough funds from their customers. Since commercial banks depend on

depositors' money as a source of funds, there are some relationships between the ability of the banks to mobilize deposits and the amount of credit granted to the customers (Obamuyi, 2013) [40].

The principal profit-making activity of commercial banks is making loans to their customers. In the allocation of funds to earn the loan portfolio, the primary objective of bank management is to earn income while serving the credit needs of the community (Read & Gill, 1989) [44].Loans constitute the largest portion of the total assets of commercial banks. McCarthy *et al*. (2010) [37] described that for most of the 10 largest U.S. banks in 2007 and 2008, loans were the largest asset, followed by investments. Also, Nwankwo (2000) [39] stated, "Credit constitutes the single largest income-earning asset in the portfolios of most banks." This explains why banks spend enormous resources to estimate, monitor, and manage credit quality.

Yitayaw (2021) [49] stated that commercial banking, especially lending, is by its nature highly prone to unpredictability, arising from different bank-specific, regulatory, and macroeconomic factors. Furthermore, Ezirim (2005) [11] stated that bank lending decisions are fraught with a lot of risks, which require a great deal of caution and tact in this aspect of banking operations since the major risk of the banking business lies in the credit function, where there is a high possibility of default. Therefore, the study of the determinants of banks' lending behavior is very crucial for banks to make a more sustainable profit from their credit portfolio.

Several studies have been carried out globally on the bank lending determinants, such as Olokoyo (2011) [41] who identified the volume of deposits, investment portfolio, lending rate, cashreserve requirement ratio, and liquidity ratio as the determinants of lending behavior, Bhattarai (2019) [9] found that liquidity ratio, interest rate spread, and exchange rate were significant in determining lending behavior in Nepal's commercial banks and Timsina (2016) [48] also found that the gross domestic product and liquidity ratio ofbanks have an impact on bank lending behavior in Nepal but all of them didn't show the directionof impact on banks' lending behavior. Abdul Adzis *et al.* (2018) [1] investigated the determinants ofcommercial banks' lending and demonstrated that bank size and volume of deposit positivelyinfluence commercial bank lending, while liquidity negatively influences bank lending activities.Yitayaw (2021) [49] distinguished the determinants of banks' lending as macroeconomic, industry-specific, and bank-specific factors. The study included bank-specific factors such as volumes of deposits, capital adequacy, and bank size; industry-specific factors such as cash reserve requirement, bank concentration, and average lending rate; and macro-economic variables such as gross domestic product and inflation.

Olumuyiwn (2012) examines the determinants of commercial bank lending behavior in Nigeria from 1975 to 2010.The study used secondary data and a series of econometric techniques to justify the long-run relationship between Commercial Bank and its lending behavior over the period of analysis. Moreover, the study investigates the level of commercial banks' loan advances in Nigeria and also examines the various determinants of commercial banks' lending behavior in Nigeria. More so, the model used is estimated using Nigerian commercial bank loans and advances (LOA) and other determinants such as volume of deposits (VD), annual average exchange rate of the naira to the dollar (FX) for the period of thirty-seven years, investment portfolio (IP), interest rate (lending rate) (IR), gross domestic product at current market prices (GDP), and cash reserve requirement ratio (RR). However, the model result reveals that there is a positive relationship between loans and advances, volume of deposits, the annual average exchange rate of the naira to the dollar, gross domestic product at current market prices, and the cash reserve requirement ratio except for investment portfolio and interest rate (lending rate), which have a negative relationship. It was also revealed from the result that there is a long-run relationship between loans and advances and all the explanatory variables in the model, and this shows that commercial banks have a lot of impact on their lending behavior.

Timsina (2016) [48] conducted the study to test and confirm the effectiveness of the determinants of commercial bank lending behavior in Nepal by using a time series ordinary least square regression approach for empirical analysis. He took the study period of 1975–2014 and sampled the total number of commercial banks present at that time. He found that the gross domestic product and liquidity ratio of banks have a significant impact on bank lending behavior in Nepal, whereas deposits, CRR, interest rates, inflation, and exchange rates have no significant effect.

Yitayaw (2021) [49] investigated the bank-specific, industry-specific, and macroeconomic determinants of commercial bank lending in Ethiopia using balanced panel data from 15 commercial banks from 2011 to 2019. To realize the stated objective, a quantitative approach and an explanatory design were employed using secondary data sources from the audited financial statements of sampled commercial banks. The model result of the study indicated that bank-specific factors such as volumes of deposits, capital adequacy, and bank size have a positive and statistically significant effect on bank lending. Industry-specific factors such as the cash reserve requirement, bank concentration, and average lending rate have a negative and statistically significant effect on bank lending. Likewise, one of the macro-economic variables, gross domestic product, has a negative and statistically significant effect on banks' lending.

Research methodology

The research is based on quantitative analysis, in which the data are collected from secondary sources through annual reports published by the Nepal RastraBank and individual banks' websites. To achieve the research objectives, this study employs descriptive, causal comparative research designs.As of July, 2022 (Licensed by NRB) there are 26 commercial banks operating in Nepal so, all the commercial banks operating in Nepal are consider as the population. Out of 26 banks only 15 banks are taken as sample in this study from the year 2011 to 2020 through convenience sampling method.

Definition of variables and Hypothesis

In this study loan and advances are taken as dependent variables whereas macroeconomic determinants (GDP, Inflation rate, and Exchange rate), industry specific (cash reserve ratio, capital adequacy ratio, lending rate) and bank specific determinants (total deposit, liquidity ratio, profitability (ROA), bank size) are independent variables.

Table 1: Name of sample banks

S.No	Name of the banks	Year	No. of observations
1	Nepal Bank Limited	2011/12 - 2020/21	10
2	Rastriya Banijya Bank	2011/12 - 2020/21	10
3	Nabil Bank Limited	2011/12 - 2020/21	10
4	Nepal Investment Bank Limited	2011/12 2020/21	10
5	Standard Chartered Bank Limited	2011/12 - 2020/21	10
6	Himalayan Bank Limited	2011/12 - 2020/21	10
7	Nepal SBI Bank Limited	2011/12 - 2020/21	10
8	Everest Bank Limited	2011/12 - 2020/21	10
9	NIC Asia Bank Limited	2011/12 - 2020/21	10
10	Global IME Bank Limited	2011/12 - 2020/21	10
11	Kumari Bank Limited	2011/12 - 2020/21	10
12	Siddharth Bank Limited	2011/12 - 2020/21	10
13	Sanima Bank Limited	2011/12 - 2020/21	10
14	NMB Bank Limited	2011/12 - 2020/21	10
15	Bank of Kathmandu Limited	2011/12 - 2020/21	10

Loan and advances

Loans and advances are explained in terms of the commercial banks' lending part of their deposits in the form of a number of credit schemes. A loan is classified as secured or unsecured based on security or demand, time or installment loan based on the repayment mode, or home, vehicle, commercial, educational, etc. based on the purpose for which it has been rendered. Similarly, advances are a type of financing provided by banks to businesses in order to meet their short-term financial needs. It is a credit facility that should be repaid within one year as per the terms, conditions, and norms issued by Nepal Rastra Bank for lending.

Gross domestic product

The real gross domestic product (GDP) is a widely used economic indicator that measures total economic activity within the economy. A strong economic condition creates more demand for goods and services, which leads to more investment in different sectors and increases the per capita income as well as savings; collectively, these factors convince banks to issue more private credit (Kashif& Mohammed 2008) [16].

H1: Gross domestic product has positive and significant effect on banks' total loan and advances.

Inflation

Inflation is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over a period of time. It is the continuous rise in the general level of prices in which a unit of currency buys less than it did previously. Often expressed as a percentage, inflation indicates a decrease in the purchasing power of a nation's currency. When inflation increases, banks also increase their cost of credit to keep up with inflation, which will result in an increased lending rate in the country (Banda, 2011) [6]. Thus, as inflation increases beyond some point, it results in a decrease in bank lending.

H2: Inflation rate has negative and significant effect on banks' total loan and advances.

Exchange rate

An exchange rate is the value of one nation's currency versus the currency of another nation or economic zone. It affects trade and the movement of money between countries. Most exchange rates are defined as "floating" and will rise or fall based on supply and demand in the market. Some exchange rates are pegged or fixed to the value of a specific country's currency. Exchange rate changes affect businesses by changing the cost of supplies that are purchased from a different country and by changing the demand for their products from overseas customers. Timsina (2016) [48] found that there is a positive relationship between the exchange rate and private sector credit growth.

H3: Exchange rate has positive and significant effect on banks' total loan and advances.

Cash reserve ratio

Cash Reserve Ratio (CRR) is the percentage of deposits that commercial banks are required to keep as cash according to the directions of the central bank. The reserve ratio is an important tool of the monetary policy of an economy and plays an essential role in regulating the money supply. Theoretically, central banks raise reserve requirements to contain credit growth in the boom part of the business cycle to counteract financial imbalances in the economy or an economic downturn. They can lower reserve requirements to enable banks to utilize reserves to extend more credit to nonfinancial businesses. Cargill and Mayer (2006) [10] investigated the effect of reserve requirements on bank lending and found that a cash reserve requirement tends to negatively influence bank lending.

H4: Cash reserve ratio has negative and significant effect on banks' total loan and advances.

Capital adequacy ratio

The capital adequacy ratio (CAR) is a measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures. The capital adequacy ratio, also known as capital-to-risk weighted assets ratio, is used to protect depositors and promote the stability and efficiency of financial systems around the world. The minimum Capital Adequacy Requirement (CAR) prescribed by Nepal Rastra Bank (NRB) as per its new capital adequacy framework is 11%, of which 6%must be core capital. Karmakar and Mok (2013) [15] found a positive relationship between bank capital and bank lending behavior.

H5: Capital adequacy ratio has positive and significant effect on banks' total loan and advances.

Lending rate

The lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector. The rate is normally differentiated according to the credit worthiness of borrowers and the objectives of financing. It is one of the monetary policy instruments used by the Central Bank to control the liquidity in the financial market. Theoretically, a high-interest rate negatively affects the demand for a loan because only limited borrowers with high-risk projects may have their demand satisfied. Yitayaw (2021) [49] concluded that the lending rate tends to negatively affect bank lending.

H6: Lending rate has negative and significant effect on banks' total loan and advances.

Liquidity

Liquidity for a bank means the ability to meet its financial obligations as they come due. For this, banks should have adequate liquidity with them. Banks should be very careful in their asset and liability management to avoid becoming liquid forever. Liquidity is the base of confidence in the banking business, and it has great implications for analyzing bank lending behavior in light of monetary policy action. In this study, the liquid assets-to-deposit ratio is taken as the liquidity related indicator. Theoretically, the high proportion of liquid assets held by the bank will directly reduce the funds available for loans. Since loans are illiquid assets, an increase in the volume of loans and advances means an increase in illiquid assets in the asset portfolio of a bank. Rabab'ah (2015) [43] found that the high liquidity maintained by the bank will reduce its ability to grant a loan to the public.

H7: Liquidity ratio has negative and significant effect on banks' total loan and advances.

Deposit

A "deposit" refers to money or assets held at a bank. When a customer makes a deposit, they place money in the bank. The deposit is the foundation of private sector credit. Deposit mobilization growth is primarily determined by economic growth, interest rates, inflation, remittance inflows, and the amount of currency in circulation. The commercial bank's deposit shows a fluctuating growth trend over the study period. Abdul Adzis *et al*. (2018) [1], Getachew (2017) [12], and Olokoyo (2011) [41] found that volumes of deposits have a significant positive relationship with bank lending, and they suggested that commercial banks should focus on mobilizing more deposits as it will enhance their lending performance.

H8: Deposit has positive and significant effect on banks' total loan and advances.

Profitability

Profitability is the capacity of a firm to make a profit, and profit is what is left over from income earned after all costs and expenses related to earning the income have been deducted. The profitability of a bank can be measured by its return on assets and return on equity ratios. Only return on assets is used as a measure of profitability in this study. Theoretically, profitable banks can provide more loans to their customers and generate income in return. Alkhazaleh (2017) [4] and Moussa and Chedia (2016) [38] found the return on assets has a positive impact on the volume of bank lending.

H9: Profitability has positive and significant effect on banks' total loan and advances.

Bank size

Bank size represents the ownership of assets by banks. High asset ownership enables banks to offer more financial services at a lower cost. The natural logarithm of the bank's total assets is used as the measure of the bank's size in this study.Rabab'ah (2015) [43] who investigated commercial bank lendingconcluded that bigger banks tend to provide higher credit facilities to the public.

H10: Bank size has positive and significant effect on banks' total loan and advances.

Model

To identify the effect of determinant variables on Commercial Banks lending this study adopted the following econometric model employed by Yitayaw (2021) [49]:

$$LOA_{it} = \alpha + \beta_1 GDP_{it} + \beta_2 IR_{it} + \beta_3 ER_{it} + \beta_4 LQ_{it} + \beta_5 CRR_{it} + \beta_6 TD_{it} + \beta_7 CAR_{it} + \beta_8 PB_{it} + \beta_9 BS_{it} + \beta_{10} LR_{it} + \epsilon_{it}$$

Where, α is Intercept /constant term, LOA is natural logarithm of the total loans and advances, GDP is Gross Domestic Product growth rate of Nepal at real term, IR is inflation rate indicated by the economic survey, ER is exchange rate, LQ is liquidity ratio, CRR is Cash reserve ratio, TD is natural logarithm of total deposits of banks, CAR is Capital adequacy ratio, PB is profitability of banks (ROA), BS is Bank Size (natural logarithm of total assets of banks), LR is Lending Rate, $\epsilon_{it}$is error term, Betas are the parameters of the models and i is no. of commercial banks while t istime period.

Results and analysis

Descriptive statistics

Table 2 shows loans and advances are dispersed from their mean value of Rs. 74499.05 million with a standard deviation of 48145.31. It fluctuates between a minimum ofRs. 9640 million and a maximum of Rs. 264840 million. The average value of GDP is 4.37%, which is highly dispersed with standard deviation of 3.19%. The minimum value for GDP is -2.37%, whereas the maximum is 8.98%. The mean value of the inflation rate is 6.74% with a highly dispersed standard deviation of 2.35%. The minimum value of the inflation rate is 3.6%, whereas the maximum is 9.93%. Similarly, another macroeconomic variable, the exchange rate, is dispersed from its mean value ofRs. 103.31 per US dollar with a standard deviation of 11.18. The minimum value for the exchange rate is Rs. 81.72 and the maximum value is Rs. 118.03. In this study, the measure of profitability for banks is return on assets. The mean value of ROA is 1.6108, with a standard deviation of 0.5445. The minimum value for ROA is 0.28%, whereas the maximum is 3.66%. For bank size, the mean value is Rs. 111605.50 million, while the standard deviation is 68623.95. Bank size

fluctuates between a minimum value of Rs. 13722.47 million and a maximum value of Rs. 346147.5 million. The total deposit has the mean value of Rs. 92484.96 million where standard deviation is of 55045.45. The minimum value of total deposit is Rs. 11178.70 million whereas maximum value isRs. 30052.00 million. The liquidity ratio has a mean value of 30.7465 and a standard deviation of 7.4770. The minimum value for the liquidity ratio is 20.10%, whereas the maximum value is 57.44%. The mean value of CRR is 15.50%, which is highly dispersed with a standard deviation of 9.1364. The minimum value for CRR is 3.22%, and the maximum value is 37.52%. The mean value and standard deviation of CAR are 12.68% and 3.5944, respectively. CAR has a minimum value of -9.35% and a maximum value of 23.68%. Lastly, the mean value of the lending interest rate is 10.45% with a standard deviation of 1.8797. The minimum lending rate is 7.145 percent, whereas the maximum is 14.478 percent. Highly dispersed values show the presence of outliers, which are removed for further testing in this study.

Table 2: Descriptive statistics of dependent and independent variables

	Mean	Std. Deviation	Minimum	Maximum	Observations
LOA	74499.05	48145.31	9640.00	264840.00	150
GDP	4.3760	3.1991	-2.3700	8.9800	150
IR	6.7420	2.3519	3.6000	9.9300	150
ER	103.31	11.18	81.73	118.03	150
ROA	1.6108	0.5445	0.2800	3.6600	150
BS	111605.50	68623.95	13722.47	346147.50	150
LQ	30.7465	7.4770	20.1000	57.4400	150
TD	92484.96	55045.45	11178.70	300252.00	150
CRR	15.5020	9.1364	3.2200	37.5200	150
CAR	12.6875	3.5944	-9.3500	23.6800	150
LR	10.4560	1.8797	7.1455	14.4786	150

Source: Calculated from Eviews 12

Correlation analysis

This study has total loan and advances (LOA) as dependent variable whereas GDP, inflation (IR), exchange rate (ER), return on assets (ROA), bank size (BS), liquidity ratio (LR), total deposit (TD), cash reserve requirement (CRR), capital adequacy ratio (CAR) and lending rate (LR) as independent variables. Table 3 shows the correlation coefficients of dependent and independent variables.

Table 3: Correlation coefficients

Variables	LOA	GDP	IR	ER	ROA	BS	LQ	TD	CRR	CAR	LR
LOA	1										
GDP	-0.0166	1									
IR	-0.6828	-0.4977	1								
ER	0.8267	-0.0988	-0.6351	1							
ROA	0.0177	0.2407	0.0207	-0.0581	1						
BS	0.9775	-0.0362	-0.6446	0.7859	0.0632	1					
LQ	-0.3203	-0.1101	0.3709	-0.3229	0.241	-0.1882	1				
TD	0.9704	-0.0547	-0.6141	0.7668	0.0499	0.9904	-0.1794	1			
CRR	-0.2309	-0.0019	0.2263	-0.2414	-0.0328	-0.2311	0.1176	-0.2262	1		
CAR	0.2392	0.1017	-0.4463	0.4354	-0.0224	0.2676	-0.0481	0.2214	-0.2344	1	
LR	-0.2486	0.1367	0.0497	-0.4490	0.0530	-0.2184	0.1144	-0.2195	0.0285	-0.1009	1

Source: Calculated from Eviews 12

The correlation coefficient of GDP and total loans and advances is -0.0166 which means they are negatively correlated with each other, which is opposite to the expectation that as the GDP of a country rises, banks' ability to provide loans also increases. Loans and advances are negatively correlated with the inflation rate with a coefficient of -0.6828, which matches the expectation of the study. The exchange rate is positively correlated with loan and advance rates with a coefficient of 0.8267. Loans and advances have a 0.0177 coefficient of correlation with return on assets, indicating that an increase in profitability will increase the amount of loans and advances made by a bank. Loans and advances have a strong positive correlation with bank size and total deposit with coefficients of 0.9775 and 0.9704, respectively. Loans and advances are negatively correlated with the liquidity ratio, CRR, and lending rate with coefficients of -0.3203, -0.2309 and -0.2486 which match the expectations of the study. Loans and advances are positively correlated with CAR with a coefficient of 0.2392, which matches the expectation that a bank with higher capital can provide a higher amount of loans and advances.

Regression analysis

The model was first run on the Pool OLS model, and then using the Bresusch Pagan test and the Hausman test, it was determined that the Random effect model is appropriate for the study. As a result, the major findings of this study are generated using a random effect model.

Table 4: Regression result from Random effect model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-0.0042	0.0036	-1.1782	0.2407
IR	-0.0196	0.0061	-3.1718	0.0019
ER	0.7329	0.1317	5.5613	0.0000
ROA	0.0290	0.0149	1.9400	0.0544
BS	0.6745	0.0779	8.6505	0.0000
LQ	-0.0093	0.0016	-5.8015	0.0000
TD	0.1862	0.0771	2.4148	0.0170
CRR	-0.0005	0.0011	-0.4372	0.6626
CAR	-0.0085	0.0045	-1.8676	0.0639
LR	3.8700	0.0038	0.0100	0.9920
C	-1.6888	0.5382	-3.1377	0.0021
R-squared	0.9871		F-statistic	1063.868
Adjusted R-squared	0.9861		Prob(F-statistic)	0.0000
S.E. of regression	0.0729			

Source: calculated from Eviews 12

A strong economic condition creates more demand for goods and services, which leads to more investment in different sectors and increases the per capita income as well as savings; collectively, these factors convince banks to issue more private credit.However, the beta coefficient of GDP is -0.0042, which shows a negative relationship with loans and advances, which is opposite to the expectation of study. It can be interpreted that, other variables being constant, a 1 unit increase in GDP decreases loans and advances by 0.42%. The hypothesis regarding GDP was that it has a significant impact on loans and advances, which is rejected since the P-value is 0.2407, which is greater than 0.05.

Theories argue that inflation rate and loan and advances have negative relationship. Since market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital/long term investment. Hence, there is negative relationship between increase in inflation rate and loan and advance. In this study the beta coefficient of inflation is -0.0196 which means other variables being constant, 1 unit increase in inflation decreases loan and advances by 1.96%. Here the P-value of inflation is 0.0019 which is less than 0.05, shows inflation has significant and negative effect on loan and advances hence the hypothesis regarding inflation is accepted.

An increase in the exchange rate results in the depreciation of the Nepalese currency, and an increase in the exchange rate increases export demand and, as a result, production in the country. On the other hand, remittance inflows increase, which results in an increase in bank deposits and lending as well. In this study, the coefficient of exchange rate is 0.7329, showing a strong positive relationship with loan and advance amounts, which can also be interpreted as, with other variables being constant, a 1% change in exchange rate would increase loan and advance amounts by 0.7329%. The fact that the P-value (0.0000) is less than 0.05 shows the exchange rate has a significant effect on loans and advances, hence the hypothesis is accepted.

Return on assets is the measure of profitability for banks. It is expected that profitable banks can provide higher loans. In this study, the coefficient of ROA is 0.0290, which shows a weak positive relationship with loans and advances. Loan and advance amounts increase by 2.90% for every unit increase in ROA. P-value (0.0544) is slightly greater than 0.05, so we can consider ROA to have a significant effect on loans and advances.

In this study, bank size is the natural log of total assets at the bank. It is generally assumed that the larger the bank, the greater its loan-making capacity. The coefficient of bank size of 0.6745 shows the positive relationship with loans and advances. If there is 1% growth in bank size, loan and advance amounts increase by 0.6745%. Also, the P-value is less than 0.05, making it significant; hence, the hypothesis regarding bank size is accepted.

If demand for loans is high, banks tend to hold fewer liquid assets since long-term loans are generally more profitable. In this study, the coefficient of liquidity of -0.0093 shows a negative relationship with loans and advances, which matches the expectation. If the liquidity ratio increases by 1 unit, loan and advance payments decrease by 0.93%. The P-value of the liquidity ratio shows that it has a significant effect on loans and advances; hence, the hypothesis is accepted.

The beta coefficient of total deposits of 0.1862 proves that it has a positive relationship with loans and advances. It also translates a 1% increase in total deposits into a 0.1862% increase in loans and advances. The P-value of the total deposit of 0.0170 shows it has a significant effect on loans and advances. Hence, the hypothesis is accepted.

The higher the reserve requirements from the central bank, the lower the amount of credit and loans a bank is willing to give to the public. As a result, the lending interest rate and the loan and advance may have a negative relationship. The result of the regression proves that CRR has a negative relationship with loan and advance with a beta coefficient of -0.0005, which can be interpreted as 1 unit increase in CRR decreasing loan and advance rates by 0.05%. The P-value of CRR 0.6626 is greater than 0.05, so the hypothesis is rejected.

Banks with higher capital are expected to provide a higher amount of loan and advance, so it is expected that CAR has a positive relationship with loan and advance. Somehow, the result does not agree with the expectation since the beta coefficient of CAR is -0.0085. If CAR rises by one unit, loan and advance fall by 0.85%. The P-value of CAR (0.0639) is greater than 0.05, making it insignificant. Therefore, the hypothesis regarding CAR is rejected.

According to theories, lending interest rates and loan and advance amounts have a negative relationship. However, the study's findings indicate a positive relationship between the lending rate and loans and advances, with a beta coefficient

of 3.87, contradicting theories. Also, the P-value of the lending rate of 0.9920 makes it highly insignificant. Hence, the hypothesis is rejected.

Discussion

The study found that GDP has negative and insignificant effect on loan and advances which is unexpected. Inflation rate has negative and significant effect on loan and advances which matches the finding of Bhattarai (2019) [9] whereas Timsina (2016) [48] and Yitayaw (2021) [49] found negative and insignificant effect on loan and advances. The findings of the study show that exchange rates have a positive and significant effect on loans and advances, which is consistent with the findings of Olokyo (2011) and Olumuyiwn (2012). The resultsof return on assets, bank size and total deposit show that they have a positive and significant effect on bank loans and advances. Because ROA is a measure of profitability, the result corresponds to the expectation that profitable banks can make larger loans. The findings are consistent with those of Alkhazaleh (2017) [4] and Yitayaw (2021) [49]. Liquidity ratio has a negative and significant effect on bank loans and advances which consistent with the findings of Timsina (2016) [48], but not with the findings of Olokyo (2011.) The results show that CRR and CAR have a negative and insignificant effect on loans and advances, whereas lending interest rate has a positive and insignificant effect on loans and advances, which is unexpected.

Conclusion and implications

The study intended to examine the effect of macroeconomic, industry specific and bank specific factors on commercial banks' lending. The study used 15 commercial banks out of 26 commercial banks as a convenience sample over a 10-year period. The study used a variety of tests to determine the best fit model for the study. According to the test, the random effect model appeared to be fit. Out of all the variables taken into account in this study, inflation rate, exchange rate, bank size, total deposit, return on assets and liquidity ratio are found to affect commercial banks' lending and are significant. However, variables like GDP, CAR, CRR, and lending rate have some effect on bank lending, but the effect is insignificant. Considering the overall result, exchange rate, and bank size are found to have a greater effect on banks' lending.

This study adds to the body of knowledge in finance about commercial banks' lending behavior. The results of this study have implications for financial institutions, practitioners, policymakers, investors, and scholars in the field of finance.When making lending decisions, commercial banks should consider both bank-specific and macroeconomic factors, particularly the exchange rate and the size of the bank. They should also make appropriate decisions to provide loans to productive and deserving sectors, which will be the most profitable decision for banks.

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