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Bank-specific determinants of non-performing loans in Bhutan: Does business strategy matter?

Rinchen Dorji

Department of Macroeconomic Research & Statistics, Royal Monetary Authority of Bhutan, Thimphu, Bhutan.
Email: uzorongdorji@gmail.com

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ABSTRACT

The study examines bank-specific determinants of Non-Performing Loans (NPLs) of commercial banks in Bhutan using time series data for the quarterly period from 2014 to 2021. Explanatory variables in this study are credit growth, deposit rate, return on equity and capital adequacy ratio. To investigate the relationship between explanatory variables and NPLs, multiple regression analysis is employed. The regression analysis exhibit that credit growth and deposit rate significantly contribute to the growth of NPLs, while return on equity and capital adequacy ratio lowers NPLs. The outcome of this study is relevant to policy makers and regulators, as the findings suggest higher credit growth and increasing cost of funds are more likely to escalate and expose the commercial banks to NPLs. In addition, adherence to regulatory norms reduces the likelihood of default risk. In this regard, investment in productive sectors and business diversification are seen as an alternative to interest income from loans and advances. The outcome of this study is consistent with past studies on the bank-specific determinants of NPLs. The findings from this study will help decision makers and commercials banks in Bhutan to develop an effective credit risk management framework.

Contribution/ Originality: This study extends the existing literature on the relationship between bank-specific variables and NPLs through the lens of a small developing economy. In addition, this paper studies the effect of business strategy on the NPLs by incorporating the deposit interest rate which have not been considered by many studies.

1. INTRODUCTION

The banking sector plays an instrumental role in the development of an economy. The significance stems through its potential and ability to mobilize resources, because of which it becomes one of the closely monitored and supervised sectors around the globe. In particular, the NPLs of the banking sector is at the regular watch of the investors and regulators, as it threatens the stability of the financial system.

The risk arises when the debtors are unwilling or unable to repay their debts (Hermosillo, 1999) and when the loan develops into NPLs. The loan becomes a NPL when borrowers are behind in scheduled payments, though NPL definitions vary and is not uniform across countries (Breuer, 2006). The Basel II framework defines NPLs as repayments due for more than 90 days on any credit obligation (BIS, 2006) and in Bhutan, the Prudential Regulations 2017 of the Royal Monetary Authority of Bhutan (RMA) classifies loans as NPLs when an installment is due but remains unpaid for 91 days or more. The loan losses as a result of NPL decreases the profitability,

liquidity, and the likelihood of banks to experience financial crisis escalates (Ekinci & Poyraz, 2019; Ghosh, 2015; Keeton & Morris, 1987). The NPLs not only distort the financial performances of the banks, but it also depletes economic efficiency and impair social welfare. The problem loans lead to deposit drainages, obstructs financial intermediation, and ultimately limits the desired pace of economic development (Zheng, Bhowmik, & Sarker, 2019). As a matter of fact, NPLs are dubbed as "financial pollution" due to their adverse financial and economic consequences (Zeng, 2012).

The adverse impact of NPLs can be traced back to series of banking distress episodes. For instance, (Hermosillo, 1999) examines five banking system distress in three different countries from 1982 to 1995 and found that rising NPLs coupled with deteriorating capital ratios were the drivers of these bank distress. Similarly, study by Ari, Chen, and Ratnovski (2020) confirm higher NPLs and loans close to default are common characteristics of banking crises. They draw this conclusion from their study exploring new dataset on the dynamics of NPLs for 88 banking crises in 78 countries since 1990.

Thus, managing and reducing NPLs in the banking system is necessary to ensure and promote financial stability. However, before any policy responses are made by the central banks to address the NPL problems, it requires a deeper understanding of its underlying causes (Ghosh, 2015). In this regard, studies have considered either macroeconomic or bank-specific factors (but not both) as explanatory variables to investigate the determinants of NPLs (Louzis, Vouldis, & Metaxas, 2012).

From the comprehensive set of literatures on the bank-specific factors, I draw the focus from Berger and DeYoung (1997). Besides emphasizing on the relationship between bank-specific factors and problem loans, they map out a possible mechanism leading to NPLs such as 'moral hazard', 'bad luck', 'skimping' and 'bad management'. Since then, many author(s) have continued the research in this line by choosing bank-specific variables based on these hypotheses and some have even blended a new set of possible mechanisms.

In this study, four bank specific hypotheses are tested with each corresponding bank specific variables as follows:

1.1. Procyclical Credit Policy

It is a concern linked to a credit growth in the banks. For the bank to increase their share of bank loans in the market, it will lower the lending rates and compromise with the credit standards by lending to non-credible borrowers. The lowering of credit standards, as a part of liberal credit policy (Louzis et al., 2012) increases the probability of loan becoming NPL (Ghosh, 2015).

1.2. Deposit Rate Effect

The deposit rate effect reviews the drawback of reduction in the interest rate spread. In a competitive business environment, the commercial banks increase the deposit rates to attract funds and charge marginal interest to the borrowers (Ahmad & Bashir, 2013). This directly reduces the interest rate spread in the short term and increases the cost of funds for the banks, ultimately putting pressure on lending rates to raise profitability (Uhde & Heimeshoff, 2009). Any resultant increase in lending rates may induce higher loan default rates.

1.3. Bad Management II

The available literatures investigate two sets of 'Bad Management' hypothesis. The first hypothesis, 'Bad Management' establishes the correlation between the efficiency and NPLs, while the second "Bad Management II" corresponds to bank performances. The low-cost efficiency or inefficiency due to poor monitoring of loan portfolios and weak credit appraisals will lead to increase in future NPLs (Berger & DeYoung, 1997; Louzis et al., 2012; Podpiera & Weill, 2008). On the other, better financial performances of the banks or better quality of management can suppress the growth of NPLs. Furthermore, a low profitability gives more incentives to engage in risky

business operations (Bayar, 2019). In both the case, inefficiency and performance indicators basically present the proxies for the quality of management (Louzis et al., 2012).

1.4. Moral Hazard

It is the problem of risk-taking as the incentives to take risk knowing that the other party will share a part of the risk. Banks with low capital tend to have higher NPLs, because despite being thinly capitalized, banks still increases the riskiness of loan portfolios to increase earnings (Ahmad & Bashir, 2013). Alternatively, higher capital lowers the risk as well as probability of NPL occurrence, as capital safeguards the commercial banks against losses and higher capital means long-term bank financing capacity and solvency (Cheng, Lee, Pham, & Chen, 2016).

The mapping of variables to the above hypothesis and its definitions are elaborated in Table 1 in section 4 of this paper. The rest of the paper is organized as follows. I emphasize on the related literature in section two followed by a brief overview of NPLs in Bhutan in section three. Section four and section five discusses the methodology and empirical findings of this study respectively. Finally, the conclusion is drawn in section 5 along with policy implications and scope for future research.

2. RELATED LITERATURE REVIEW

There are a considerable set of literatures exploring the factors leading to credit defaults. In most of the literatures that emphasized on the macroeconomic factors, they draw a strong relationship and confirm higher bank losses during economic downturn. On the other, the bank-specific factors too have equally gained attention since it is endogenous to banking sector. Since the focus of this study is to determine the effect of bank-specific variables on the NPLs, this section highlights the related literature review on bank-specific factors although few papers have also examined the macroeconomic impact in separate set of models.

While studies have used different bank-specific variables in their model, most of the literature findings agree to a common consensus. In one of the notable works in this field, (Berger & DeYoung, 1997) test the relationship between loan quality, bank capital and cost efficiency by employing Ganger-causality test for the US commercial banks from 1985-1994. The causality test finds an increase in NPLs is directly associated to fall in cost efficiency and weak capitalization of the banks because of poor loan portfolio management and moral hazard incentives. By employing additional bank-specific variables, (Ghosh, 2015) applies a fixed effects and dynamic-Generalized Method of Moments (GMM) estimation to determine the NPLs in US banking sector and finds the increase in the NPLs are largely due to operating inefficiency and poor credit quality, while banks profitability measured by return on assets (ROA) lowers the NPLs. The banks profitability often proxied for "bad management II hypotheses" manifest the effect of management quality and which has empirically been in favor of it Louzis et al. (2012). Ghosh (2015) further concludes that the credit growth (via a procyclical credit policy) is positively associated to NPLs growth, similar to the findings of Ahmad and Bashir (2013); Ahmed, Majeed, Thalassinos, and Thalassinos (2021); Bayar (2019). Additionally, Ahmad and Bashir (2013) also evaluate the effect of deposit interest rate on future NPLs problems and conclude that the reduction in interest rate spread by means of increasing interest rate on deposits to attract funds aggravates the NPLs challenges in the case of Pakistan's banking sector. With the increase in the cost on deposit liabilities, one of the alternatives to seek profits is through increasing lending rates which directly impact the debtors as debt servicing becomes costlier and the likelihood of loan becoming NPLs intensify.

In a similar study conducted in Pakistani banking sector from 2008-2018, Ahmed et al. (2021) found that despite the detrimental effect of macroeconomic variables, the bank specific variable significantly had higher different coefficient values. Growth in loans and advances generate more profits but augments NPLs due to break off in credit standards, and profitability reduces the NPLs as profitable banks venture into prudent market lending and these banks are financially stable (Ahmed et al., 2021).

A more of a cursory look into a country specific study, Goswami (2021) applies two-step system GMM approach to determine the time persistence of credit risk in Indian banks from 1998/99 to 2016/17. The study finds that factors such as higher profitability, more diversified income, better managerial efficiency, and sound credit screening and monitoring will relieve the pressure on NPL accumulation and minimize the likelihood of default risk. Another neighboring country to Bhutan, the Nepalese banking system is facing a crisis where some banks and financial institutions have failed in the last few years due to high NPLs (Singh, Basuki, & Setiawan, 2021) and has been a concern of significant issue for last few decades in the context of Nepal (Bhattarai, 2017). Unlike the findings of other studies, in the case of Nepal (Singh et al., 2021) conclude significant positive relationship between profitability measured by ROA and NPLs, whereas (Bhattarai, 2017) results show increase in loan results in the decrease of NPLs. The positive relationship between profitability and NPLs could be a possibility as per the model of Rajan (1994) where banks inflate current earnings at the expense of rising future NPLs due to concerns associated to short-term reputation and profit maximation objectives. For the decrease of NPLs as loan expands, new loans may have productive outcomes (Bhattarai, 2017) and as the volume of total loan outstanding increases, the NPL ratio decreases[1].

In the case of Greece, a study by Louzis et al. (2012) employ the GMM method to examine seven bank-specific variables mapped to eight hypotheses on three different types of loans i.e mortgage, business and consumer loans for the period spanning from 2003Q1 to 2009Q3. However, they find significance for only three hypotheses. They find inefficiency statistically significant and positive for all three NPL categories, providing strong support for the 'bad management' hypotheses. The return on equity (ROE) proxied for 'bad management II' stands significant and negative only for mortgages and consumer loans. The final positive significance is found in leverage ratio as a measure of bank size for mortgage and business loans. These findings strongly provides evidence of how inefficiency and performance can actually signal future loan problems.

Using a Dynamic Panel Regression Analysis for Emerging Market Economies (EMEs), Bayar (2019) found a strong negative relationship between the bank-specific factors such as capital, profitability and non-interest income to NPLs, while credit growth contributed to the growth of NPLs. In essence, his study rules out the moral hazard incentives and bad management II hypothesis as a determinant of NPLs in the EMEs. Consistent to the findings of Bayar (2019) bank capital and reserves to total assets and ROE are negatively correlated in the case of Eurozone (Makri, Tsagkanos, & Bellas, 2013).

From the related literature survey discussed above, it can be observed that the study on the NPLs gained momentum after the global financial crisis of 2007-08 although available empirical theories on NPL determinants have been discussed before, such as (Berger & DeYoung, 1997; Hermosillo, 1999; Keeton & Morris, 1987).

3. THE BHUTANESE BANKING SYSTEM AND NPL OVERVIEW

The first commercial bank in the country, Bank of Bhutan Limited was established in May 1968 to cater the needs of the growing economy. It not only functioned as commercial bank but also acted as a central bank until the RMA was set-up as a central bank of Bhutan on 4th August 1982. Currently, the Bhutanese financial sector comprises of five commercial banks, four nonbank financial institutions, five microfinance institutions and one National Cottage and Small Industries Development Bank (RMA, 2022).

In the last decade, the financial sector of Bhutan witnessed a remarkable transformation. The evolution came through restructuring and privatization of banks, interest rate liberalization, digitalization, enhanced access to finance, and reinforced banking sector supervision. Despite these developments, the challenges associated to rising NPLs has been a major concern for banks in the country. Few studies in the past did emphasize concerns associated to deteriorating credit quality in Bhutan. An assessment of financial sector development in Bhutan by Cole and

[1]Since the NPL ratio is ratio of gross non-performing loans to total loans and advances, an increase in the denominator will bring down the value of the ratio.

Carrington (2016) found that Bhutan's banking system is well capitalized when compared to regional countries such as India and Sri Lanka but possessed poor asset quality than these countries.

According to the Financial Sector Performance Review report published quarterly by the RMA, the total loan outstanding of the financial sector expanded from Bhutanese Ngultrum (Nu) 55.67 billion in December 2011 to Nu 185.91 billion in June 2022. In the same review period, the Gross Non-Performing Loans (GNPL) ballooned from Nu 1.95 billion to Nu 16.06 billion.

In order to counter the rising NPLs and bring credit discipline amongst the borrowers, the RMA undertook extraordinary measures for the first time as a regulatory entity. In May 2022, the RMA directed three financial service providers to temporarily suspend disbursing loans due to their high NPLs and was even directed to develop remedial measures. Even for the individual borrowers, the RMA in October 2022 issued a strict notification that any loan becoming NPL will have to undergo a six-month cooling period with no access to credit from any financial institutions, even if the NPL amount is repaid and resolved.

Furthermore, to discourage the financial institutions from accumulation of the NPLs, the Prudential Regulation 2017 (Section 9.4.1) of the RMA sets an eligibility condition on declaring dividends. To declare dividends the financial institutions should have net NPL ratio of less than 5% for the accounting year.

Against this background, the study is timely considering the recent concerns and issues related to the NPLs in Bhutan. To the best of my knowledge, the study is the first of its kind to investigate the bank-specific determinants of NPLs within the context of Bhutan.

4. DATA & METHODOLOGY

4.1. Data and Choice

The sample covers a quarterly data from 1st quarter 2014 to 4th quarter 2021. The data is sourced from the Financial Sector Performance Review report and Core Indicators prepared by the Department of Financial Regulation & Supervision of the RMA.

The nonbank financial institutions and other financial service providers such as Micro-Finance Institutions are excluded in this study. This is because the primary focus of the study was commercial banks and also, meeting the data requirement for the non-banks and other institutions was a challenge. Furthermore, the choice of commercial banks was motivated due to its large holdings (share) of the loan portfolio and their rising NPLs in recent years.

4.2. Specification of the Variables

The details of variables, definition, hypothesis, and relationship of the variables are given in the following Table 1.

Table 1. Definition of variables, hypothesis testing and relationship.

Dependent variable	**Symbol**	**Definition**		
Non-performing loans	NPL	Ratio of gross non-performing loans to total loans and advances		
Explanatory variables	Symbol	Definition	Hypothesis tested	Expected impact
Credit growth	Credit	Ratio of change in total loan outstanding	Procyclical credit policy	+
Deposit rate	Deposit	Ratio of interest expenses to total deposits	Deposit rate effect	+
Return on equity	ROE	Ratio of profit after tax to average capital fund	Bad management II	-
Capital adequacy ratio	CAR	Ratio of capital fund to total risk weighted assets	Moral hazard	-

4.3. Methodology

This study applies a multiple regression model to test the impact of bank specific variables on the NPLs of commercial banks in Bhutan. The empirical model to be estimated is given as:

$$NPL_t = \alpha_0 + \alpha_1 CREDIT_t + \alpha_2 DEPOSIT_t + \alpha_3 ROE_t + \alpha_4 CAR_t + \varepsilon_t \quad (1)$$

Here, α_0 is a constant term, t is the time trend, $\alpha_1 \ldots . \alpha_4$ are the coefficient parameters and ε_t is the random error term. The explanatory variables are as discussed in Table 1.

The Unit root of the series was checked with Augmented Dickey-Fuller (ADF) test. The test indicated stationary at levels I (0) for GROWTH and ROE. For DEPOSIT and CAR, the variables became stationary at first differentiation I (1) at 5 percent significance level.

5. EMPIRICAL FINDINGS

5.1. Estimation Output

The Ordinary Least Squares (OLS) estimate of Equation 1 is summarized in Table 2.

Table 2. Estimation output.

Variables	Coefficient	Std. error	t-statistic	Prob.
C (Constant)	-0.017	0.007	-2.408	0.024**
Credit	0.442	0.166	2.660	0.013**
Deposit	0.410	0.230	1.785	0.086*
ROE	-0.262	0.075	-3.466	0.002***
CAR	-0.972	0.435	-2.236	0.035**
R-squared	0.697	F-statistic		14.383
Adjusted R-squared	0.649	Prob (F-statistic)		0.000
Durbin-Watson stat	2.114	Log likelihood		75.010

Note: *, **, *** denotes significance level at 10%, 5% and 1% respectively.

As good as the R-squared value of 0.697, all the explanatory variables have a significant effect on the NPLs in this study. In particular, lagged CREDIT and DEPOSIT is found to have a significant positive effect on the NPLs. On the other, ROE and CAR results exhibits negative effect on the NPLs.

The positive effect of CREDIT (via Procyclical Credit Policy) and DEPOSIT (Deposit Rate Effect) could correspond to the business strategy of the commercial banks. Firstly, the commercial banks in Bhutan are evaluated on the annual performance compact at the board and management level, where increase in loan portfolio is one of the apparent performance targets in bank businesses. Since financial incentives such as bonuses of the managers and employees are mapped to the outcome of the performance compact, it is highly possible to accommodate lower credit standards resulting in future NPLs. Secondly, in a small economy like Bhutan, bank deposits are major source of funds for the banks. One of the business strategies to attract funds in a small competitive business environment is to raise interest rates, particularly on time deposits as it is non-volatile in nature. This is clearly evident as Fixed Deposit alone accounted to 45.96% (Nu 86.79 billion) of total bank deposits (Nu 188,845.48 billion) in commercial bank deposits in Bhutan as of June 2022. The rise in deposit interest rate increases the cost of funds. Since marginal cost of fund is a major component in the computation of Minimum Lending Rate (a single benchmark or minimum reference rate for lending applied to all financial institutions in Bhutan), it will eventually put pressure on the lending rates.

The negative effect of ROE on the NPLs can be viewed through loan loss provisioning requirement. The growth in NPLs will attract provisioning requirement based on different risk exposures. For instance, the RMA requires 100% provision requirement for the Loss / Suspended loan category. The provisions are charged from the profit of the banks. Higher NPLs will increase the provisions and impact the profitability. Similarly, the CAR requirement for the commercial banks in Bhutan is stringent. The Basel Framework requires financial institutions to maintain a minimum CAR of 8% and the minimum regulatory requirement set by RMA is 10% and 12.5%

including the Capital Conservation Buffer. Since the commercial banks are well capitalized, the probability of NPL occurrence due to thin capital in the context of Bhutan is low.

5.2. Model Stability

The overall robustness of the model was examinied using few diagnostic tests. The Durbin-Watson test value of 2.114 (Table 2) indicate 'no autocorrelation' in the variables used in this model. Additionally, the test of normality, serial correlation and heteroscedasticity was conducted to further verify the model stability, which is summarized (Table 3).

Table 3. Tests of residual diagnostics.

Tests conducted	Nature of tests	*P*-value	Diagnosis
Jarque-Bera	Normality test	0.487	Normal
Breusch-Godfrey lagrange multiplier test	Serial correlation test	0.876	No serial correlation
White's test	Heteroskedasticity test	0.729	Homoscedastic

These diagnostic tests confirm that the model is normal, free from the problem of heteroscedasticity and no serial correlations among the variables have been detected.

6. CONCLUSION

This study explored the bank-specific determinant of NPLs of a commercial bank in Bhutan from quarterly period 2014 to 2021 by running a multiple regression analysis. The explanatory variables used in this study are Credit growth, deposit rate, ROE and CAR. The outcome of the regression estimate revealed that one lagged value of credit growth and deposit rate had a significant positive effect on NPLs, while ROE and CAR were found to have negative impact on NPLs. The findings drawn from this study were found to be consistent with many relevant literatures.

The findings of this study have few implications for policy makers and regulators, as the findings highlight the significance of institutional environment as well as the regulatory authority. Since Bhutan is a bank-based economy and bank credit being the primary driver of private investment, poor regulation and monitoring could have severe implications. Firstly, bank-specific factors such as credit growth can be controlled by the banks and the findings indicate an exponential growth in the credit could expose the banks to NPLs. The banks could cautiously allocate credit to productive sectors that has the economic and commercial potential. In the interest of profitability, loose credit policy and loans to sub-standard borrowers should not be encouraged. Secondly, for the banks to increase profitability, focus should not only be concentrated on interest income from loans. The diversification of income from other sources will equally be helpful in controlling the growth of problem loans as concluded by Goswami (2021); Ahmed et al. (2021); Bayar (2019). On the other part, the RMA should continue with the prudent regulatory requirement such as CAR and loan loss provisioning as these prudential norms are found to control the excessive growth of problem loans. Moreover, the risk management framework and compliance practices at the institutional level should be periodically reviewed and strengthened. Based on the results obtained from this study, the RMA should insist on managerial performances and develop sound corporate governance process, particularly in the nomination and recruitment of board directors and executives in the financial institutions. The study can be extended by incorporating macroeconomic factors and other bank-specific variables as a determinant of NPLs in Bhutan and other developing economies. Furthermore, future research can also study the nonbank financial institutions of Bhutan by employing different sets of industry specific variables.

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