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Implications of Liquidity Risk and Credit Risk on the Bank of Bhutan's Financial Performance (BOB)

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Abstract
Purpose: The study's objective is to provide insight on the influence of liquidity risk and credit risk on the Bank of Bhutan (BoB) financial performance. For this Return on Equity (ROE) and Return on Asset (ROA) were employed as dependent variables in this study to assess BOB's economic health. Liquidity risk and credit risk have been used as independent variable which is measured using CAMEL model for this study.
Methodology: The study is based on data from secondary source i.e., annual financial report furnished by BoB for 10 years (2010-2019), where descriptive research is generated based on quantitative analysis
Findings: The study's findings demonstrated that the independent factors (liquidity risk and credit risk) had a substantial influence on BOB's financial performance, as evaluated by proxy variables ROE and ROA. The study also discovered that, unlike credit risk, liquidity risk has a considerable influence on the ROA.
Value/Originality: This paper is based on descriptive study of the secondary data for the Bank of Bhutan, the largest commercial bank of Bhutan. The study context is not well represented in the body of knowledge and is less explored in the context of Bhutan.
Limitations: The study examines only the liquidity risk and credit risk of BoB, there are other risks also that might affect the financial performance. Further, this study is based only on the study of one bank in Bhutan and is based on the annual reports (2010- 2019) of the bank.

Keywords: Financial Performance, Return on Asset, Return on Equity, Liquidity Risk, Credit Risk

Introduction

Bank of Bhutan (BoB) is the oldest bank in the country and plays a pivotal role in economic development. It provides wide array of financial products and services, which also provide us with risk management services and finances to their clients, businesses, and government. As the banking sector governs so much of the world's economy, banks are critical to economic

progress (Mendoza & Rivera, 2017). BoB, like any other commercial bank, is exposed to various risks, such as liquidity, interest rate, default, and exchange rate. Instead of minimizing risk, banking has always been about accepting and managing it (Mendoza & Rivera, 2017). Among all the risks surrounding their banking operations, two of the most vital and decisive risks are liquidity and credit risks. Banks extend credit to finance various projects and investment proposals, which will place an economy in the growth trajectory.

With the rise in defaults rates and non-performing assets of banks, the very existence of the banks is at stake. Hence, major thrust has been placed today on effective credit risk management among majority of banks across the globe (Chou & Buchdadi, 2016). Moreover, inability of banks in matching its liability of funds, has led to increase in their liquidity risks. To finance its assets operations, banks rely heavily on money markets, which ultimately magnifies banks' liquidity problems (Saunders & Cornett, 2005). The present study attempts to shed light on the impact of liquidity risk (LR) and credit risk (CR) on financial performance of the BOB. Furthermore, the research would assist BOB in identifying their strengths, weaknesses, opportunities, and threats.

Problem Statement

Financial institutions (FIs)are foundation to a nation's economic growth and progress. The financial institutions are undergoing transformations, one driven by the competitions among the banks, changing business models, and (LR). The financial hurdles faced by banks include unexpected withdrawal of funds by the depositors (liquidity risk), the possibility that the borrowers would not repay back their debts on time (credit risk) and that rate of interest might vary (interest risk) (Cecchetti and Schoenholtz, 2011). Among these, the most vital ones faced by the BOB are LR and CR. Bank of Bhutan (BOB) had faced the problem of liquidity crunch. There was the shortage of funds and there was more demand for loans and investments, but banks do not have enough funds to meet the demand of their customers. This was because due to a shortage of depositors, banks are unable to transform their assets into cash without sacrificing capital and income. On the other hand, credit decisions have a critical role in a bank's financial performance. Inability of banks to assess the credit worthiness of their borrowers, resulting in extending loans to them beyond their repaying capacity (high risk customers), might increase their NPAs. The need of the hour for BOB is to enforce internal loan and credit management strategies to ensure that credit extended are repaid on time and in full. With this background, following objectives are proposed.

1. *To Determine the degree of liquidity and credit risk that BOB is exposed to.*
2. *To shed insight on the financial performance implications of liquidity risk.*
3. *To shed light on how credit risk affects financial performance.*
4. *To figure out how well a company is doing financially.*

Study Variables

Return on Assets (ROA)and Return on Equity (ROE) are utilized as proxy variables to measure financial performance of BOB and were the dependent variable for the study. Whereas LR and CR were considered as independent variables and were measured with the help of CAMEL variables. As loan to total income leads to CR whereas loan to total value leads to LR. This information is crucial to the bank while disbursing the loan to a salaried customer or to a business, thus, the main risk/threat to banks of Bhutan among other risks are these two, so CR and LR are relevant for studying the risk factors. These variables are explained in Table 1.

Table 1: Definition of the key variables

Name of the Variable	Definition	Formulae/ Equation
Return on Equity (ROE)	It is a metric that assesses an institution's capacity to earn profit from each unit of its shareholders' equity. The (ROE) is an important indicator of a bank's success.	$\frac{Profit\ after\ tax\ (\ Net\ income)}{Total\ equity\ capital\ (total\ shareholders\ fund)}$
Return on Assets (ROA)	It is measure of efficiency of a company with regards to generation of profits from its financial assets.	$\frac{Net\ Income}{Total\ Assets}$
Capital Adequacy (C)	This CAMEL model component is a measure that gauges the bank's solvency. It gives the bank a buffer against probable loan losses and other unforeseeable situations. (Parvesh & Sanjeev, 2016).Where, Tier 1 capital includes shareholders equity, disclosed reserves, and innovative capital instruments. Tier 2 capital includes undisclosed reserves, revaluation reserves, hybrid capital instruments and uncollected reserves.	$\frac{Tier\ 1 + Tier\ 2\ capital}{Risk - weighted\ Assets}$
Assets Quality (A)	This ratio indicates how strong a bank's financial position is. Loans and advances account for a substantial amount of a bank's assets.	$\frac{Total\ NPL}{Total\ Loans}$
Management Efficiency (M)	It is a measure that ensures the bank's growth and longevity. The management's efficacy is evaluated using this method. As a measure of managerial efficiency, the Credit Deposit Ratio will be employed. This ratio is used to determine a bank's liquidity and financial soundness	$\frac{Total\ Loan}{Total\ Deposits}$
Earning capacity (E)	This measure reflects the bank's ability to generate adequate returns. The earnings of the bank are made up of all income from all operations. This parameter evaluates a bank's efficiency in terms of capital adequacy to cover all potential losses and dividend payment ability. As a measure of earnings quality, the net profit margin will be used.	$\frac{Net\ profit}{Total\ Revenue/income} * 100$
Liquidity (L)	The bank's capacity to turn assets into cash to satisfy its credit and cash flow needs. Banks with significant liquidity are seen to be safe since they can withstand a sudden withdrawal. The cash deposit ratio will be used as a measure of liquidity in this study.	$\frac{Total\ Cash}{Total\ Deposits}$

Literature Review

Extending credit may be a severe danger to a bank's performance, and if allowed uncontrolled, might result in the bank's failure. LR, on the other hand, may be a trap for institutions with weak risk assessment and management practices. Both risks cannot be neglected considering the current developments in the banking sector, as they significantly influence the bank's performance and survival (Coyle, 2000). Robust credit and liquidity management strategies should be designed and thoroughly executed to limit the combined impact of these risks on a bank's financial results.

Liquidity Risk and Financial Performance

Liquidity risk (LR), as in view of Dermine (1986), is a cost of profit decrease. When most major banks run out of easily available client deposits and other monetary capital, a general liquidity crisis arises in financial institutions. The bank faces a big LR when a customer withdraws cash from the bank without reason. This has an influence on the day-to-day operations of the financial industry. As a result, bank activities suffer a major setback, resulting in large revenue losses (Ejoh, Okpa, & Egbe, 2014). In other words, LR happens when a bank fails to satisfy its short-term obligations due to a lack of liquidity and an unexpected withdrawal of money (Diamond & Rajan, 2005). LR in the banking sector is exacerbated by cash surplus and shortages. Bourke (1989) examined bank performance and the elements that impacted it, concluding that banks with more liquidity produced higher profits. Banks with a high of liquidity, according to Kosmidou (2008), have better financial consequences. A collection of 25 Bangladeshi banks was analyzed by Rahman et al. (2015) where the LR is linked to a bank's financial performance.

The capacity of bank management to acquire and ensure the smooth running of the bank's overall business efficiency is measured by the ROA ratio. Higher ROA indicates that banks have sufficient revenue to meet their short-term commitments. LR has a large influence on ROA, according to earlier studies (Al-Khouri & Shen, 2011). The capacity of a corporation to make a profit for its shareholders is described by its return on equity (ROE). Banks with a larger LR or a wide liquidity gap, according to (Shen, 2011), should employ liquidity assets from external funding to fulfill the demand for funds. Rudhani, and Balaj (2019) in their study found that banks capacity to sustain short term demand for liquid funds, endure liquidity crunch and confront risk in the face of substantial non-liquid assets exhibit higher financial performance in terms of their Return on Equity and Return on Assets. Huong, et al. (2021) in their study proposed that under normal economic conditions, the impact of liquidity risk on banks' performance has been found to be positive. However, the impact of the former on the latter becomes negative in case of financial crisis. Hacini, I. et al. (2021) conducted a study to shed light on the relationship between liquidity risk and financial performance of banks in select Saudi Arabian banks. Liquidity risks, measured by variables: Loan-to-deposit ratio and Cash-to- deposit, was found to negatively affect the financial performance of the banks, which is measured by Return to Equity and Equity to total Assets Ratio.

H_1 Liquidity risk is having significant impact on ROE of BOB.

H_2 Liquidity risk is having significant impact on ROA of BOB.

Credit Risk and Financial Performance

Credit in this context is used to describe the process of *"borrowing and lending*" money. As a result, credit risk is defined as a responsibility originating from a customer's failure to pay on time and in full his or her commitments or payments owing to the bank. Banks are exposed to risks like Credit, liquidity, market, and operations. The greatest severe hazard to banks, on the other hand, is credit risk (Chen & Pan, 2012). According to Garissa(2013), the non-performing loans (NPL) to total loan ratio (NPLR) is the most widely utilized by experts as non-performing

debts pose a significant threat to the banking industry and consequently would impact the bank's performance. The NPLs ratio has been presented to quantify credit risk (Nawaz et al., 2012; Musyoki and Kadubo, 2012; and Poudel, 2012).

Quality of an asset and the riskiness of a bank's credit are determined by the amount of NPL. The link between bank performance and credit risk was explored by Felix and Claudine (2008). Their analyses indicate that the proportion of NPL in a financial institution's total lending is inversely related to both ROE and ROA, as effective tools to gauge bank performance, implying that performance is declining. In a panel study done by (Poudel R. P., 2012) using ROA as a performance indicator, the performance of commercial banks in Nepal was demonstrated to be negatively related to credit risks. Similarly, Onaolapo& Olufemi (2012) used secondary data in the form of Nigeria'scentral bank publications over a 10-year period to analyse the influence of capital sufficiency on the bank performance.

Shahid, M. et al. (2019) found a significant relationship between credit risk and financial performance of select commercial banks in Pakistan. The study shed light on the negative relationship between credit risk measures: Non-performing Loan ratio, Credit facilities and Capital Adequacy Ratio, and banks' Return on Assets/Return on Equity. Siddique, A.et al. (2021) in their study found that non-performing loans, cost-efficient ratio, and liquidity ratio negatively affects financial performance, measured Return on Assets and Return of Equity of Asian Commercial Banks. Rasa, R. (2021) In his study attempted to shed light on the impact of credit risk, measured by LLRTL (Loan Loss Reserve to Gross Loans), TLTA (Total Loans to Total Assets) and Total Loans to Total Deposits (TLTD), on the profitability, measured by three proxy variables: Return on Assets, Return on Equity and Net Interest Margin (NIM) of the commercial banks in Afghanistan. The findings showed that LLRTL had a significant negative impact on ROA and ROE, while had a insignificant positive impact on NIM. Moreover, TLTD and TLTA, as measures of credit risk, had a significant positive impact on NIM, while its impact on ROA and ROE were found to be insignificant**.**

With this background, following hypothesis have been established:

H_3 ROE of BOB is impacted significantly by the Credit risk.

H_4 ROA of BOB is impacted significantly by the Credit risk.

Liquidity Risk and Credit Risk

According to Diamond and Rajan, there is a relationship between LR and CR (2005). They claim that if the bank finances too many economic ventures with loans, it would be unable to meet depositor demand. Therefore, if the value of these assets decreases, depositors will be able to recover their funds. As a result, both LR and CR are increasing simultaneously.

More credit risk and higher LR from depositor demand result when banks utilizeall their loans and limit total liquidity. Since new loans in the banking system raise bank risk, financial organizations establish debts that must be renewed on a regular basis and used to fund assets (Archarya& Viswanathan, 2011). Because a loan default creates liquidity risk owing to the lower cash inflow and depreciation it produces, it is considered as a profit-reducing expenditure (Dermine, 1986). The link between CR & LR should be positive. This premise is supported by both theoretical and empirical literature on financial intermediation, such as that simulated by (Bryant, 1980). (Diamond &Dybvig, 1983). Increasing credit risk is complemented by increased LR due to depositor demand. As a result, bank LR and CR are crucial factors to examine when determining the soundness of a bank.Gorton and Metrick provide a fresh perspective on the relationship between LR and CR (2011). Their actual research shows how, in today's reality, a bank run caused by investor anxiety may happen. The literature shows how banks' views of credit risk might affect LR. On the other hand, it indicates that bank LR and CR are inextricably linked.

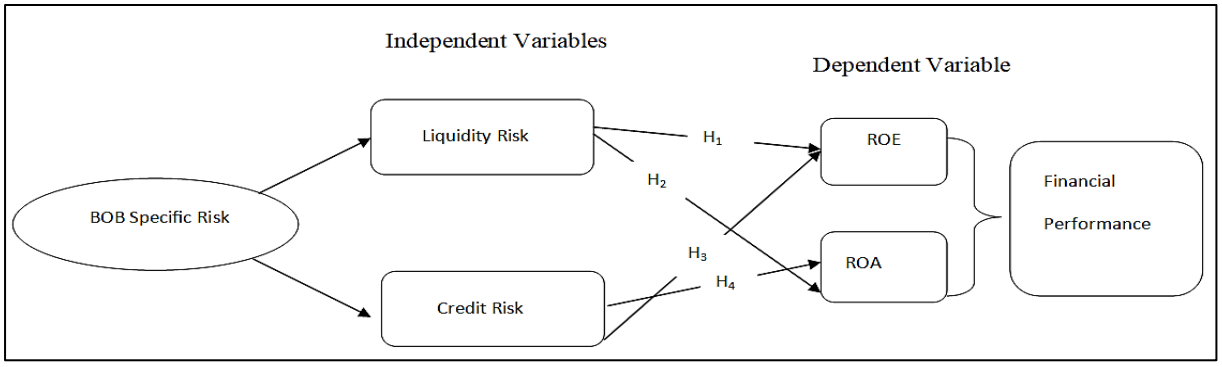

Figure 1: Conceptual Framework
Source: Adapted from Cheng, Nsiah, Charles &Ayisi (2020)

Research Methodology

BOB's annual financial statements for the past decade (2010- 2019) were utilized for the purpose of analysis. The implications of LR and CR on BOB's financial performance was assessed using CAMEL's model. The CAMEL rating model was chosen because it allows banks to be transparent, evolve, and transform. It clearly defines structural strengths and weaknesses around the board in terms of financial and managerial capabilities. The data interpretation had been purely descriptive in nature. The capital adequacy and asset quality were used to measure the independent variable that is credit risk and management efficiency, and liquidity was used to measure the independent variable liquidity risk. Earning capacity was used to measure both LR and CR of BOB. To meet the objectives of this study, audited reports (annual report) extracted from the BOB website for last ten years were used and processed through descriptive statistics. The CAMELS rating system, on the other hand, is a well-known international rating system that banks use to assess financial performance. To check the association between variables and performance, a *regression model* had been adopted. Further, *hypothesis testing* had been done using the *t-test,*to find significant difference. All these testing and computations had been done with the help of SPSS.

Data Analysis and Findings

Table 2 highlights that the minimum ROE and ROA for BOB are 12% and 1.40% respectively and recorded maximum ROE and ROA of 22.80% and 2.40% respectively during the study period. ROA has an average mean value of 1.93% is an indication that BOB is not effectively utilizing its assets in making its financial performance strong. ROA over 5 percent is deemed to be good and over 20 percent is considered as excellent, based on discernible studies being made. The average ROE of 17.78% reveals that BOB is effectively utilizing equity investors' money to produce gain for investors. Average capital adequacy which measures the credit risk of the bank is 16.48% surpasses the regulatory requirement of 10.5%, which means BOB has adequate amount of capital to deal with the unexpected credit risk. The average asset quality is 1.75 percent, which is lower than the permissible ratio of 5%, implying less NPL.

Table 2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROE	10	.120	.228	.17772	.033621
ROA	10	.014	.024	.01929	.003164
C	10	.149	.216	.16477	.019329
A	10	.004	.044	.01655	.011619
M	10	.477	.782	.64851	.096892
E	10	.309	.534	.41320	.078634
L	10	.050	.660	.29730	.180651

Source: Authors Calculations

According to Nagaraju and Boateng(2018), The optimum percentage of credit deposit ratio to be employed in funding lending operations is around 80 and 90 percent. Therefore, the average management efficiency (credit deposit ratio) which measures the liquidity risk of the bank is 64.85%. The average liquidity has been found to be 29.73 percent, implying that about 30% of the mobilized deposit is employed to fund the BOB's lending activity, which is lower than the optimal ratio.

Regression Analysis

Regression model was used for performance measure of Bank of Bhutan. To measure the financial performance of BOB, Return on Equity (ROE) and Return on Asset (ROA) have been used as dependable variable for this study and Liquidity risk and credit risk have been used as independent variable which is measured using CAMEL model.

Regression Result of ROA

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.952[a]	.907	.791	.001446

a. Predictors: (Constant), Liquidity, Capital Adequacy, Earning Capacity, Asset Quality, Management Efficiency

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	5	.000	7.821	.034[b]
	Residual	.000	4	.000		
	Total	.000	9			

a. Dependent Variable: Return On Assets

b. Predictors: (Constant), Liquidity, Capital Adequacy, Earning Capacity, Asset Quality, Management Efficiency

The corrected R2 value is displayed in table 2. The adjusted R2 indicates how well the independent factors explain the dependent variables. The adjusted square of 0.791 in table 2 indicates that the independent factors account for 79.1% of the variation in the dependent variable (ROA). The regression model's significance is shown in Table 3 at 5%. (F-Statistics). The regression equation is stated below:
ROA= -0.061+0.058C-0.101A+0.068M+0.045E+0.033L

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.061	.014		-4.404	.012
	C	.058	.028	.351	2.032	.112
	A	-.101	.048	-.371	-2.109	.103
	M	.068	.012	2.087	5.684	.005
	E	.045	.008	1.111	5.321	.006
	L	.033	.006	1.900	5.327	.006

a. Dependent Variable: Return on Assets

Regression Results of ROE

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.790	.528	.023108

a. Predictors: (Constant), Liquidity, Capital Adequacy, Earning Capacity, Asset Quality, Management Efficiency

Table 7: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.008	5	.002	3.010	.154[b]
	Residual	.002	4	.001		
	Total	.010	9			

a. Dependent Variable: Return On Equity

b. Predictors: (Constant), Liquidity, Capital Adequacy, Earning Capacity, Asset Quality, Management Efficiency

Table 8: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.243	.222		-1.097	.334
	C	.112	.453	.064	.247	.817
	A	-.322	.766	-.111	-.421	.696
	M	.434	.192	1.250	2.264	.086
	E	.081	.134	.189	.602	.580
	L	.313	.100	1.681	3.133	.035

a. Dependent Variable: Return on Equity

The value of R square and Adjusted R square may be found in table 5. The adjusted R square value is 0.528, indicating that the independent variables account for 52.8 percent of the variation in ROE. Although the adjusted R-square value is not large enough, it is fair.

Results and Discussions

Regression result of ROA: The study discovered a favorable (but not statistically significant) link between capital sufficiency and bank financial performance. This finding is in line with prior research by Bilal et al. (2013) and Al-Jafari and Alchami (2014). Similarly, asset quality has showed a small but unfavorable relationship with the bank's financial performance. The bank's ROA will drop by 37.1 percent for every unit rise in NPLs. Furthermore, with a standardized coefficient of 2.087, management efficiency has been determined to have a substantial positive relationship with the BOB's financial success. On the other side, earning capacity has showed a positive but negligible relationship with the bank's ROA. Furthermore, a positive and substantial association was discovered between liquidity and bank performance. Naceur and Kandil (2016), as well as Charles and Kenneth (2016), backed up this conclusion (2013).

Regression result of ROE: The study discovered a link between capital sufficiency and return on investment (ROI). This means that BOB's financial performance will improve when more capital is invested. This conclusion contradicts the findings of Athanasoglou et al. (2006), Hosna et al. (2009), Ayele et al. (2012), and Bilal et al (2013). Furthermore, the relationship between Asset quality and ROE was discovered to be negative, implying that a unit rise in NPLs will result in an 11.1 percent fall in ROE. This result contradicts the findings of Boateng's research (2019). The efficiency of management was shown to be favorably associated to ROE; however, the relationship was statistically insignificant. This research contradicts Boateng's (2019) findings, where the linkage between managerial efficiency and ROE has been found to be significant in the positive direction.

Hypothesis Testing: Table 8 shows the stated hypothesis of the study and its outcome. Paired sample t-test was used for the hypothesis testing. Asset quality (NPLR) was taken as a measurement for the credit risk and liquidity (CDR) was taken as a measurement for the liquidity risk.

Table 9: Summary of hypothesis testing

Hypothesis	Significant value	Remarks
H_1 = Liquidity risk is having significant impact on ROE.	0.043	Accepted
H_2= Liquidity risk is having significant impact on ROA.	0.001	Accepted
H_3= Credit risk is having significant impact on ROE.	0.000	Accepted
H_4= Credit risk is having significant impact on ROA.	0.507	Rejected

Conclusions

Banks have a fundamental part to play in the expansion of economic activity in today's fast-paced economic environment. However, because risk is inherent in banking operations, banks confront a variety of dangers, the most frequent of which are liquidity risk and credit risk. Liquidity, which evaluates the company's liquidity risk, is shown to be one of the most important elements affecting the BOB's economic performance. Because the BOB's NPLis rising year after year, the BOB is facing a substantial credit risk. As a result, credit risk and liquidity risk must be managed for the BOB's everyday operations to improve.The study's aim to assess the impact of liquidity and credit risks on the Bank of Bhutan's financial performance (BOB). During this reason, BOB's secondary data was employed for a decade (2010-2019). The regression model was used to figure out how credit risk and liquidity risk affect BOB's financial performance (ROA and ROE). According to the findings, liquidity risk and credit risk have a significant impact on the Bank of Bhutan's Return on Equity (ROE). Liquidity risk, on the other hand, has a significant impact on Return on Assets (ROA), but credit risk has no significant impact, according to the study (ROA). NPL and liquidity ratios necessitate additional care from management since they reveal the severity of the bank's liquidity and credit risk, both of which have an influence on its financial performance.

Limitation of the Study

- The study examines only the liquidity risk and credit risk of the bank, however there are other risks which impact a on the financial performance of the BOB.
- The study examines the financial performance of Bank of Bhutan which is limiting the sample size.
- The study has evaluated the data for the last 10 years only and did not get the latest data (Annual report of 2020).

Future Scope of Study

Future scholars can also do study on liquidity risk and credit risk posed by other financial institutions in other Dzongkhags. This study will also assist schools, institutions, and instructors in gaining fresh understanding about BOB's liquidity and credit risk. Other major issues and factors that have not been covered in this study can also be included by the researcher.

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