

Credit risk is the possibility that a party will suffer financial loss if a counterparty to a financial instrument default on a contractual obligation. When it comes to a financial instrument, the bank's credit risk is the possibility that its counterparty or customer won't fulfill their end of the contract and end up losing money on the bank. The bank's investment securities and client receivables are the main sources of credit risk. Using loan restrictions based on international rating agencies' credit ratings, the bank's foreign exchange reserve's credit risk is tracked and evaluated.

Agoraki et al. (2009) approved that utilizing data from the banking industries in Central and Eastern Europe from 1998 to 2005 suggests that banks with market dominance typically take on less credit risk and have a lower default likelihood. Further, Fungacova and Weill (2009) analyzed the impact of bank rivalry on bank failures using a sizable sample of Russian banks from 2001 to 2007. They contend that increased bank competition is bad for the stability of the financial system.

Credit concentration risk arises from inadequate diversification of credit portfolios, which causes concentrations of exposures in a particular firm, industry, or geographic area, as mentioned by Bris and Welch (2005) and Tiwari (2010).

In Bank Supervision Report-2022/23, it has been stated that commercial banks are supervised by the NRB using a risk-based approach. This method is being gradually used to oversee other BFIs. Significant issues are reported to the concerned bank so that appropriate corrective action and improvement can be made in the near future. Under risk-based supervision, major risk areas and other significant areas of banks are assessed. Risk profiles are developed/created based on the quantity of risk, quality of the risk management procedures and direction of the risks.

Credit risk is the possibility that a counterparty or bank borrower won't fulfill their end of the agreement. By taking on and sustaining credit exposure within reasonable bounds, credit risk management seeks to reduce risk and increase the bank's risk-adjusted rate of return.

It is shown that changes in interest rates impact default probabilities for a selected group of emerging government debt liabilities. Various forms of this kind of interdependence are investigated, particularly before and after the most recent global financial crisis. In contrast to a significant trend where this study primarily focuses on explaining short-term daily variations, and addresses time variations in sovereign credit risk by examining changes in spreads and yields over 1-year time intervals (Jeanneret, 2015).

The relationship between oil prices and government credit risk is also worth emphasizing as interest in it has recently grown, especially as studied through the CDS market (Dauvin, 2016; Hooper, 2016; Wegener, Basse, & Mettenheim, 2016; Naifar, Shahzad, & Hammoudeh, 2017).

Study observed has focused on the impact of liquidity on fluctuations through sovereign yield and spread (Herrero & Mencia, 2015; and Fontana & Scheicher, 2016). The existing work's another aim is to evaluate which is a historical VaR methods based on bond yields widely used in the banking industry with a joint evaluation of interest rate and credit spread based on the time series of quotes of the corresponding derivative instruments. This comparison makes it feasible to measure the liquidity component of a sovereign bond yield.

Tanda (2015) approved that banking regulations influenced on capital and risk decisions, the study results depend on country, time period, and type of capital. On the other hand, Dietrich, and Wanzenried (2009) claimed that there is no significant relationship between changes in bank capital and capital standards imposed by regulators. The essence of the discourse over the adequacy of bank capital, according to Buser et al. (1981), is the requirement to create regulatory disincentives to bank risk-taking. Jamali (2020) justified that the bank capital significantly affected by capital guidelines, supervisory power, and supervisory structure.

He (2012) recommended that the implementation of a 2.5 percent expected loan loss level for all banks fails to account for foreign banks' margin in risk management and does not precisely reflect the actual expected credit losses of foreign banks. Loan loss provision significantly improves non-performing loans (Ahmed, Takeda, & Shawn, 1998). Thus, an increase in loan loss provision indicates a rise in credit risk and a decline in loan quality.

Nepal Rastra Bank's Annual Report for 2022–2023, the analysis of the overall supervision and financial status of commercial banks is included in the annual full-scope bank supervision report for 2021–2022, which has been released. Additionally, based on loan loss provision-related data obtained from the banks, a brief report has

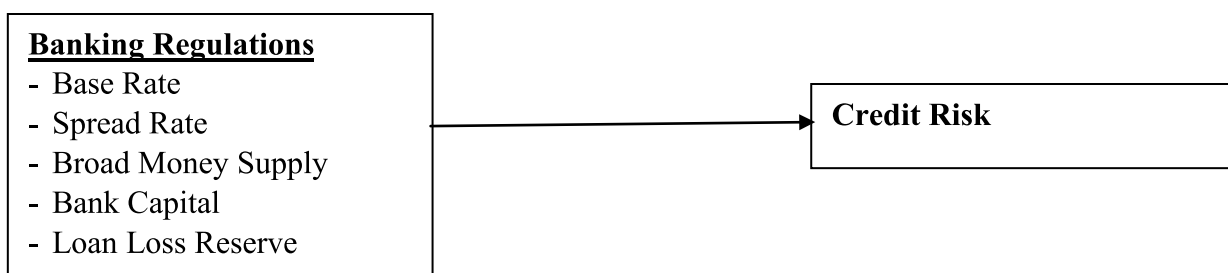
been prepared at the end of each quarter detailing whether or not the loan loss provision has been maintained as mentioned in the supervision report.

Broad money supply (M2) is summation of narrow money (M1) and time deposit held at commercial banks. M1 consists of currency held by the public, demand deposits held at commercial banks and other deposit held at the NRB. Time deposit consists of saving deposits, fixed deposits, and margin deposits with commercial banks.

Rashid and Jehan (2014) explained that the broad money supply has less of an impact on output than the short-term interest rate, whereas prices and exchange rates return to their long-run equilibrium more quickly when the money supply is taken into account as a monetary policy indicator.

Sims (1998) and Bernanke and Blinder (1992), the broad money supply should not be preferred over the short-term interest rate as it is a more effective indicator of monetary policy. But in a small open economy, broad money may be a more accurate measure of monetary policy, (Berument & Dogan, 2003; Karki 2018). Monetary policy has a crucial role in maintaining stability in both the nominal and real sectors of the economy (Rashid & Jehan, 2014).

Based on above review of literature which were published from different international and national journals and other resources in the perspective of impact of Nepal Rastra Bank regulations specifically base rate, spread rate, broad money supply, bank capital, and loan loss reserve on credit risk of commercial banks in Nepal is still remaining. Based on this issue, this study attempts to analyze the impact of banking regulations (base rate, spread rate, broad money supply, bank capital, and loan loss reserve) on credit risk of commercial banks in Nepal. For this purpose, following theoretical framework has been developed:



Methods

This study measured existing position of base rate, spread rate, broad money supply, bank capital, loan loss reserve, and credit risk of commercial banks in Nepal. For this purpose, descriptive, correlational and causal comparative research design have been employed. This study has focused on essential of Nepal Rastra Bank’s regulation for minimizing credit risk of commercial banks in Nepal. Descriptive statistical tools (mean, maximum value, minimum value, and coefficient of variation) were used to measure the existing position of bank regulations in this study. Correlational research design has been used to measure the relationship between the variables used in this study. Similarly, causal comparative research design has been used to measure the impact of bank regulations (base rate, spread rate, broad money supply, bank capital, and loan loss reserve) on credit risk of commercial banks in Nepal. Population of this study is all commercial banks of, Nepal. Out of these, 100 percent Government owned bank i.e. Rastriya Banijya Bank has been excluded in this study. Twenty-six commercial banks were included in this study before merging and nineteen commercial banks after merging. Out of these, certain banks’ data of particular year is excluded due to lack of annual audit report. Following regression model has been used to measure the impact of banking regulations on credit risk:

$$CR_{i,t} = \alpha_0 + \beta_1 BR_{i,t} + \beta_2 SR_{i,t} + \beta_3 BMS_{i,t} + \beta_4 BC_{i,t} + \beta_5 LLR_{i,t} + \epsilon_{i,t}$$

Where, credit risk is dependent variable and independent variables are; base rate, weighted average spread rate, broad money supply, bank capital (sum of core capital i.e. Tier 1 capital and supplementary capital i.e. Tier 2 capital), and loan loss reserve.

Results

Table 1 has presented range, maximum value, minimum value, standard deviation, and coefficient of variation of bank capital, loan loss reserve, broad money supply, credit risk, base rate, and weighted average spread rate.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	C.V.
BC	241	4398193	140232067893	12895637269.82	12251480978.455	95
LLR	241	-5082100304	14789309588	1508923758.10	1557406754.872	103.21
BMS	260	1315376280000	5505400800000	3116325358000.00	1400526725449.940	44.94
CR	243	136389233	392084956357	83169961719.97	56892087591.965	68.4
BR	203	3.84	12.08	8.5288	1.80183	21.13
SR	244	2.49	7.32	4.2038	.75823	18.04
Valid N (listwise)	195					

Based on above fact findings presented in table 1, it has been found the highest fluctuation on loan loss reserve than after bank capital, credit risk, broad money supply, weighted average spread rate, and base rate respectively.

Table 2 has presented relationship between bank capital, loan loss reserve, broad money supply, credit risk, base rate, and weighted average spread rate.

Table 2: Correlation Analysis

Variables	BC	LLR	BMS	CR	BR	SR
BC	1					
LLR	.375**	1				
BMS	.629**	.257**	1			
CR	.697**	.439**	.798**	1		
BR	.024	.058	.000	-.082	1	
SR	-.032	.230**	-.282**	-.053	-.128	1

** . Correlation is significant at the 0.01 level (2-tailed) and * . Correlation is significant at the 0.05 level (2-tailed)

There is high degree of direct relationship between broad money supply and credit risk at 1 % level of significance. Similarly, there is positive relationship between bank capital and broad money supply as well as bank capital and credit risk at 1 % level of significance. Again, there is low degree of direct relationship between loan loss reserve and bank capital; loan loss reserve and broad money supply; loan loss reserve and credit risk; as well as loan loss reserve and weighted average spread rate at 1 % level of significance. There is low degree of inverse relationship between broad money supply and spread rate at 1 % level of significance.

Table 3 presented the regression result of credit risk regressed on bank capital, loan loss reserve, broad money supply, base rate, and weighted average spread rate.

Table 3: Regression results

	β_0	B1BCi,t	B2LLRi,t	B3BMSi,t	B4BRi,t	B5SRi,t
Standardized coefficients		0.241	0.145	0.623	-.103	0.027
t	-.156	4.848	3.492	12.312	-2.677	.669
Sig.	.876	.000	.001	.000	.008	.504
VIF		1.705	1.198	1.768	1.026	1.135

Dependent variable: CR, Independent variables: BC, LLR, BMS, BR, and SR. ANOVA: d.f. 5, Residual 189, Total = 194, Sig. at 0.000, F = 100.391, Durbin Watson = 2.011 Adjusted R-Squared = 0.719.

ANOVA results approved that this regression result is statistically significant at 1 % level of significance. Adjusted R-squared has approved that this regression model explained 71.9 % area of the study as well as this model is nearness to goodness of fit. Value of Durbin Watson approved that this regression model is free from positive and negative auto correlation. Value of each independent variables variance inflation factor approved that this regression model is free from multicollinearity problem. Coefficient value of bank capital approved that when independent variable will be increased by one unit, on an average dependent variable credit risk will be increased by 0.24 unit on an average at 1 % level of significance if other things are remaining the same. Similarly, loan loss reserve will be increased by one unit, credit risk will be increased by 0.145 unit at 1 % level of significance if other things are remaining the same. But when independent variable base rate will be increased by one unit, on an average dependent variable will be decreased by 0.103 unit at 1 % level of significance if other things remain same. Again, when independent variable broad money supply will be increased by one unit, on an average dependent variable will be decreased by 0.669 unit if other things remaining the same.

Discussions

Increase in loan loss reserve increases the credit risk. This result is similar with (Ahmed, Takeda, & Shawn, 1998). Bank capital has significant effect on credit risk and this is similar with (Jamali, 2020). There is significant impact of base rate on credit risk and it is similar with (Jeanneret, 2015). Broad money supply has significant impact on credit risk and this result is also similar with Rashid & Jehan (2014). There is direct relationship between credit risk with broad money supply, bank capital, and loan loss reserve. Bank capital, broad money supply, and loan loss reserve have positive influence on credit risk but base rate has negative influence on credit risk.

Conclusion

Credit risk is affected by different factors. Out of these, this study focused only on regulatory factors of Nepal Rastra Bank which is central bank of Nepal. Out of regulatory factors of Nepal Rastra Bank, these have direct impact on different factors like base rate, weighted average spread rate, bank capital, broad money supply, loan loss reserve, cash reserve ratio, core capital etc. These factors directly influence on paying capacity of borrower i.e. credit risk. Out of these factors (bank capital, broad money supply, base rate, spread rate, and loan loss reserve), broad money supply has highly influenced on credit risk. These study findings concluded that Nepal Rastra Bank's regulation is essential for minimizing credit risk.

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