THE FACTORS DRIVING INTEREST RATE SPREAD OF COMMERCIAL BANKS: EMPIRICAL EVIDENCE FROM NEPAL

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ABSTRACT

The study has investigated the determinants of interest rate spread in Nepalese banking sectors, based on panel data for the 5 years period of 12 commercial banks, from 2012/13 to 2017/18. The data were collected from the respective banks' annual report, which has been published in the web page of the particular banks. To examine the determinants of interest rate spread, three different models like Pooled ordinary least square, Fixed Effects and Random Effects analysis methods have been employed. The Interest rate spread has been taken as the dependent variables and default risk, cash reserve ratio, return on assets, bank size, GDP growth rate, inflation and exchange rate as independent variables. The study found that there is positive and significant result between default risk, profitability and inflation rate with interest rate spread. The other remaining variables such as cash reserve ratio, size of the banks and GDP growth rate are positive, but insignificant result have been found except exchange rate negative and insignificant. Hence, the study concluded that the default risk, profitability and inflation rate were determinants of interest rate spread in Nepalese commercial banks perspectives.

KEYWORDS: *Commercial Banks, Interest Rate Spread, Default Risk, Cash Reserve Ratio, Return on Assets, Bank Size, GDP Growth Rate, Inflation and Exchange Rate & Nepal*

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1. INTRODUCTION

In a country like Nepal, the net interest rate spread is the difference between the average yields that a financial institution receives from loans, along with other interest-accruing activities and the average rate it pays on deposits and borrowings. The net interest rate spread is a key determinant of a financial institution's profitability (or lack thereof). The net interest rate spread is instrumental to a bank's profitability. The spread rate (between loan and deposit) is to be reduced to 4.4% by all commercial banks by Ashad End 2077 (Monetary Policy Highlights 2019/2020, p.7).

The spread between lending rate and deposit rate in Nepal has been widening over the years. It is noted that, this situation accounts for the slow growth rate of the economy, as private businesses are unable to borrow at the current interest rate, to expand their businesses so as to create employment to absorb the unemployed masses. There was a general perception that while lending rates were too high to induce any meaningful investment, and were at the core of low private sector investment in Nepal, however, borrowing rates were too low for savings mobilization (Bhattarai, 2017).

As cited by Njeri, Ombui and Kagiri (2015), IRS defined as, the difference between the interest rate

charged on the borrowers and the rate paid to the depositors (Were & Wambua, 2014).

Bank-specific factors have played major roles to determination of interest rate spread in banking industries (Atabaki, 2006).

This study has included the bank specific factors such as credit risk, cash reserve requirements, profitability and bank size; and macroeconomics factors of GDP growth rate, inflation and exchange rates have been employed. The five year panel data from 2012/13 to 2017/18 of twelve banks has been used. The major factors; default risk, profitability and inflation rate were determinants of interest rate spread in Nepalese commercial banks' perspectives.

The study has been further designed as follows: section two review of literature, research methodology in section third, section four results and discussion and summary and conclusion have been at the final section of the study.

2. REVIEW OF LITERATURE

The major review of literature related to this study is as follows. The literature has major role to conceptual framework development, hypothesis formulation and research design.

Khawaja and Din (2007) have asserted that interest rate spread in Pakistan bank by using panel data of 29 banks. The study found that interest-insensitive deposits in total bank deposits have played the main role to determination of interest rate spread.

Khan and Khan (2010) have analyzed the determinants of interest rate spreads of commercial banks in Pakistan of total sample 28 banks, and study period was 1997 to 2009. The findings of results show that interest rate spreads of commercial banks were determined by the banks' low cost of funding; operating expenses; and opportunities to earn income from non-core business activities. The macroeconomic variables, such as real GDP and interest rates also have positive influence on interest rate spread.

Were and Wambua (2014) have investigated the determinants of interest rate spread in banking sector of Kenya, based on panel data. The study has found that bank size, credit risk, return on average assets and operating costs were positively rated to interest rate spreads. Similarly, the bank liquidity ratio has a negative effect on the spreads. The macroeconomics variables monetary policy rate is positive significant.

Bhattarai (2017) has analyzed the determinants of interest rate spreads of commercial banks in Nepal. The study has employed the pooled OLS model, fixed effect model and random effect model to investigate the bank-specific variables affecting interest rate spread by using the panel data of 7 commercial banks, over the period of 6 years from 2010 to 2015. The estimated regression models reveal that default risk, profitability and bank size have significant and positive impact on interest rate spreads. Cash reserve requirement has negligible effect on interest rate spreads. The study concludes that the major determinants of commercial banks' interest rate spreads are default risk, profitability and bank size in Nepal.

Samoei and Toroitich (2019) have revealed the determinants of interest rate spread among commercial banks in Kenya, by using quarterly time series data for the period 2005 to 2014. The study has employed statutory reserve requirements, inflation rate, exchange rate volatility, Treasury Bill Rate, gross domestic product as independent variables to investigate interest rate spread. The study found that Treasury bill rate, reserves and gross domestic product, exchange rate volatility and inflation rate have statistically significant impact on the banking sector interest rate spreads, in Kenya. The study has recommended that there is need for policies to deal with reserve requirements, as well as putting in place

measures, to stabilize the exchange rate volatility in Kenya.

3. RESEARCH METHODOLOGY

This study is based on the secondary panel data, which were gathered for the period 2012/13 to 2017/18 from twelve commercial banks in Nepal. The data were collected from the respective bank's annual report, which has been published in the web page of the particular banks. The data were collected for Interest rate spread, credit risk, cash reserve ratio, return on assets and bank size.

3.1 The Model

The data have been analyzed through the Gretl software 1.9.4 version. In the model, the dependent variable is Interest Rate Spread(IRS). Credit risk, cash reserve ratio, return on assets and bank size are independent variables. This study, based on three panel models such as pooled OLS model, fixed effect model and random effect model have been employed for data analysis. The model is presented as follows:

$$IRS_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CRR_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + e_{it}$$

Where,

β_0 = Constant term

β_1 to β_4 = Coefficient of Variable

IRS_{it} = Interest Rate Spread of i^{th} bank in year t

CR_{it} = Credit Risk Ratio of i^{th} bank in year t

CRR_{it} = Cash Reserve Ratio of i^{th} bank in year t

ROA_{it} = Return on assets of i^{th} bank in year t

$SIZE_{it}$ = Firm size of i^{th} bank in year t

GDPGR = GDP Growth Rate in year t

INF = Inflation Rate in year t

ER = Exchange Rate with US \$ in year t

e_{it} = Error term

3.2 Variables Measurement and Expected Results

The description of dependent and independent variables used in the study, and their measurement and expected sign are shown in table 2.

Table 2: Variables Measurement and Expected Sign

Variables	Measurement	Notation	Expected Sig	Source of Findings
Dependent Variables				
Interest Rate Spread	Different Interest Rate between Loan and Deposit	IRS	N/A	
Bank Specific Variable				
Credit Risk	Non-performing Loan to Total Loan	CR	+	Chirwa and Mlachila (2004) and Siddiqui (2012), Were and Wambua (2014), Bhattarai (2017)
Cash Reserve Ratio	NRB Rules	CRR	+	Akinlo and Owoyemi (2012), Akinlo (2012), Bhattarai (2017)
Return on Total Asset	Net profit After Tax to Total Assets	ROA	+	Afzal and Mirza (2010), Siddiqui (2012), Were and Wambua (2013), Bhattarai (2017)
Bank Size	Natural Logarithm of Total Asset	LnTA	+	Maudos and Solis (2009), Afzal and Mirza (2010) Were and Wambua(2014), Bhattarai (2017)
Macroeconomic Variables				
GDP Growth Rate	GDP Growth Rate	GDPGR	+	Were and Wambua (2013), Rebei (2014), Churchill et al (2014), Neli (2015), Kiptui (2014), Folawewo and Tennant(2008), Niyimbanira et al (2015), Akinlo and Owoyemi (2012), Grenade (2007), Crowley (2007), Afanasieff et al(2002)
Inflation	Inflation Rate	INF	+	Atabaki, M (2006), Nazarian and Hasheminejad, Were and Wambua (2013), Rebei (2014), Sheriff and Amaoko (2014), Churchill et al (2014), Ghasemi and Rostami (2016), Neli (2015), Folawewo and Tennant (2008), Niyimbanira et al (2015), Akinlo and Owoyemi (2012), Crowley (2007), Afanasieff et al (2002), Tarus et al (2012)
Exchange Rate	NRS and US\$ Exchange Rate	ER	+	Nazarian and Hasheminejad (2009)
<i>Source: Field Survey (2020)</i>				

4. RESULTS AND DISCUSSIONS

4.1 Descriptive Statistics

Table 3 shows that the average interest spread rate is 4.28 percent, whereas minimum and maximum rates are 2.49 percent and 7.15 percent, respectively. The standard deviation is less than one percent. It revealed that there is low deviation in term of interest spread rate. The sample commercial banks in Nepal have near close in the interest spread rates. The non-performing loan ratio i.e. called default risk ratio is, minimum 0.18 percent to maximum 24.7 percent. It shows that there is vast differentiate between the range.

Table 3: Descriptive Statistics

Variable	Scale	Mean	S.D.	Min	Max
ISR	%	4.28	0.996	2.49	7.15
DR	%	2.51	3.65	0.180	24.7
CRR	%	20.9	21.5	5.49	92.8
ROA	%	1.71	0.920	-3.43	3.12
LnTA	Ln	25.0	0.596	23.8	27.5
GDPGR	%	4.60	2.50	0.400	7.40
INF	%	7.32	1.98	4.48	9.90
ER	NRS	103.	3.44	98.3	106.
<i>Source: Annual Report of Sample commercial banks and Results are Drawn from Gretl Software 1.9.4 Version</i>					

The average profitability ratio called ROA is 1.71 percent. Which range are negative 3.43 percent to 3.12 percent respectively. The GDP growth rate is minimum 0.40 percent 7.40 percent. It is very low due to the earthquake 2015/16 in Nepal than after it is in the trend of increasing. The average inflation rate is 7.32 which is higher than these days. It has been increasing trend in the coming year (other than effect of COVID-19 -2020).

4.2 Correlation Analysis

The table 4 reveals the Pearson correlation coefficient matrix of study variables. The relation between default risk ratio, cash reserve ratio, return on assets, size of the banks, GDP growth rate, inflation and exchange rate with US dollars and interest spread rate are found. There is positive relationship between default risk ratios, cash reserve ratio, return on assets, size of the banks and inflation and interest spread rate. It shows that, these variables are moving in the same direction with the interest rate spread. Whereas, the relation between GDP growth rate and US dollar exchange rate have negativity with interest rate spread.

Table 4: Correlation Matrix of Study Variables

ISR	DR	CRR	ROA	LnTA	GDPGR	INF	ER	Variables
1.0000	0.2185	0.1305	0.2136	0.2602	-0.0379	0.1727	-0.1429	ISR
	1.0000	0.0251	-0.6311	-0.1640	-0.0220	0.0583	-0.2049	DR
		1.0000	0.0831	-0.1094	0.0190	0.0088	-0.0717	CRR
			1.0000	0.5419	-0.0095	-0.1089	0.2661	ROA
				1.0000	0.1406	-0.2604	0.3189	LnTA
					1.0000	-0.7379	-0.1307	GDPGR
						1.0000	-0.2879	INF
							1.0000	ER
<i>Source: Annual Report of Sample commercial banks and Results are Drawn from Gretl Software 1.9.4 Version</i>								

The result of negative relationship shows that, if interest rate spread increases, the GDP growth rate and US dollars exchange rate decrease and vice-versa. The correlation coefficient is less than 0.80; it is represented that there is absence of multi collinearity among predictors.

4.3 Regression Analysis

Table 5 represents the regression results of determinants of interest rate spread, by three different methods like Pooled ordinary least square, Fixed Effects and Random Effects analysis methods.

Table 5: Regression Results of Determinants of Interest Rate Spread of Sample Commercial Banks in Nepal

Model 1: Pooled OLS, Using 60 Observations					
Variables	Coefficient	Std. Error	t-ratio	p-value	VIF
Const	-3.71901	7.07516	-0.5256	0.6014	
DR	0.147494	0.0420940	3.504	0.0010***	1.910
CRR	0.00363047	0.00534947	0.6787	0.5004	1.076
ROA	0.565201	0.197821	2.857	0.0061***	2.684
LnTA	0.280432	0.249902	1.122	0.2669	1.797
GDPGR	0.0920738	0.0787788	1.169	0.2478	3.153
INF	0.195921	0.102108	1.919	0.0605*	3.317
ER	-0.0221720	0.0420135	-0.5277	0.5999	1.690
R-squared		0.352955	Adjusted R-squared		0.265853
Test for Different Group Intercepts F(7, 52)		4.052197	P-value(F)		0.001301
Durbin-Watson		1.642630			
Model 2: Fixed-effects, Using 60 Observations					
	Coefficient	Std. Error	t-ratio	p-value	
Table 5: Contd.,					
Const	-3.83604	7.08408	-0.5415	0.5911	
DR	0.137371	0.0436719	3.146	0.0031***	
CRR	0.00713794	0.00550090	1.298	0.2017	
ROA	0.526923	0.214196	2.460	0.0182**	
LnTA	0.281139	0.255999	1.098	0.2785	
GDPGR	0.0897782	0.0763907	1.175	0.2467	
INF	0.193362	0.0988927	1.955	0.0574*	
ER	-0.0207526	0.0409127	-0.5072	0.6147	
R-squared		0.522404	Adjusted R-squared		0.392736
Test for Different Group Intercepts F(18, 41)		2.491483	P-value(F)		0.007830
Durbin-Watson		2.200521			
Model 3: Random-effects (GLS), Using 60 Observations					
	Coefficient	Std. Error	Z	p-value	
Const	-3.73169	6.89485	-0.5412	0.5884	
DR	0.145474	0.0413639	3.517	0.0004***	
CRR	0.00444676	0.00524580	0.8477	0.3966	
ROA	0.558057	0.196260	2.843	0.0045***	
LnTA	0.279732	0.244938	1.142	0.2534	
GDPGR	0.0916424	0.0761841	1.203	0.2290	
INF	0.195417	0.0987178	1.980	0.0478**	
ER	-0.0218215	0.0406697	-0.5366	0.5916	
Breusch-Pagan Test -			Hausman Test -		
Chi-square(1)		0.541985	Chi-square(4)		4.87046
p-value		0.461611	p-value		0.300849
Durbin-Watson		2.200521			
Note: ***, Correlation is significant at the 0.01 level (2-tailed), **, Correlation is significant at the 0.05 level (2-tailed).					
*Correlation is significant at the 0.10 level (2-tailed)					
Source: Annual Report of Sample commercial banks and Results are drawn from Gretl Software 1.9.4 Version					

The value of R-square is relatively high in the Fixed Effects Model i.e. 39.23%. The explanatory power of model is very low, because there is 60.77 % variation explanation by other variables. There is significant and positive results found between interest rate spread and default risk ratio in all models. It shows that when default risk increases, the interest also increases in Nepalese sample commercial banks. The result is consistent with findings of Chirwa and Mlachila (2004) and Sidiqqi (2012), Were and Wambua (2013) and Bhattarai (2017). Similarly, the profitability is found positive and significant with interest rate spread. The results show that higher profitable Nepalese commercial banks always have higher

interest spread rate. The result is found, as per priori hypothesis. The result of the study is similar with the inference in previous studies of experts like Afzal and Mirza (2010), Siddiqui (2012), Were and Wambua (2013), and Bhattarai (2017). Furthermore, the inflation rate is positive and significant at 10 percent level. The result is consistent with the findings of Afanasieff et al (2002), Atabaki, M (2006), Crowley (2007), Folawewo and Tennant (2008), Akinlo and Owoyemi (2012), Tarus et al (2012), Were and Wambua (2013), Rebei (2014), Sheriff and Amaoko (2014), Churchill et al (2014), Neli (2015), Niyimbanira et al (2015), and Ghasemi and Rostami (2016). It shows that higher the inflation rate demand, higher is the interest rate spread in the countries like Nepal. This is also, as per priori expectation.

The other remaining variables such as cash reserve ratio, size of the banks and GDP growth rate are positive, but insignificant results have been found except exchange rate negative and insignificant. The results of findings point out that, these variables have positive role for interest rate spread, but could not effects significantly in Nepalese sample commercial banks. The result has been similarly found in the three different models.

5. SUMMARY AND CONCLUSIONS

The study has investigated on the determinants of interest rate spread in Nepalese banking sectors, based on panel data analysis. The panel data were gathered for the 5 year period, from 2012/13 to 2017/18 twelve commercial banks in Nepal. The data were collected from the respective bank's annual report, which has been published in the web page of the particular banks. To examine the determinants of interest rate spread, three different methods like Pooled ordinary least square, Fixed Effects and Random Effects analysis methods have been employed. The Interest rate spread has been taken as dependent variables, and default risk, cash reserve ratio, return on assets, bank size, GDP growth rate, inflation and exchange rate as independent variables. The study found that, there is positive and significant result between default risk, profitability and inflation rate with interest rate spread. The other remaining variables such as cash reserve ratio, size of the banks and GDP growth rate are positive, but insignificant results have been found, except exchange rate negative and insignificant. Hence, the study concluded that the default risk, profitability and inflation rate were determinants of interest rate spread, in the Nepalese commercial banks' perspectives.

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