



An Empirical Investigation on the Determinants of Interest Rate Spread of Commercial Banks in Bangladesh

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ABSTRACT

This paper aims to investigate the determinants or factors affecting the interest rate spread of private commercial banks in Bangladesh from 2013 to 2022. For the purpose of the study, the interest rate spread (IRS) of banks has been considered as a dependent variable while bank-specific factors and macroeconomic factors have been considered independent variables. Bank-specific factors are credit risk, bank size, operating cost ratio, liquidity risk, net interest income as a ratio of total income, capital adequacy ratio, and loan to deposit ratio while macroeconomic factors are Inflation and GDP. The Pooled Ordinary Least Square method (OLS), the Fixed Effect method (FE), the Random Effect method (RE), and the Generalized Least Square method (GLS) have been used to investigate the impact of the factors on interest rate spread. The results exhibit that bank-specific factors such as net interest income as a ratio of total income, and capital adequacy ratio are found to be statistically significant and positively impact the interest rate spread. In contrast, the results also exhibit that bank-specific factors such as bank size, operating expense ratio, and loan to deposit ratio are statistically significant and negatively impact the interest rate spread. Again, the results determine that the macroeconomic factor which is inflation found to be statistically significant and positively impacts the interest rate spread. The study's findings will assist the banks' regulatory body in formulating and developing strategies to maintain a satisfactory level of interest rate spread.

Keywords: Interest Rate Spread, Credit Risk, Bank Size, Liquidity Risk

JEL Classifications: C3, G3, G32

1. INTRODUCTION

A bank, an essential part of the financial system, plays a crucial role in the remarkable economic growth. Banks facilitate capital production, money mobilization, and financial intermediation, all of which establish the framework for economic growth. Financial markets are small or sometimes nonexistent in developing countries, in contrast to other developed countries where the banking system and financial markets cooperate to carry out such funds. Banks retain the responsibility of facilitating the transfer of funds in a safe and profitable manner, as well as serving as a bridge between savers and borrowers (Sufian and Habibullah, 2009). The interest rates banks charge on providing loans and collecting deposits are indicators of their level of efficiency in

financial intermediation and an economic factor which is economic growth can be influenced (Huizinga, 1998).

As banks are businesses that aim to make money, must make enough money to cover the costs of serving a wide range of customers with financial services. Both interest and non-interest income make up this revenue. Simultaneously, expenditures associated with meeting the requirements of the central bank, which oversees the regulation of banks, as well as operational and funding costs are all included in the category of expenses. Banks therefore make sure that lending interest rates are higher than deposit interest rates. Banks pay interest rates on deposits, but they gain from interest rates on loans. Multiple interpretations of interest rate spread are also exhibited in the literature. The interest rate spread refers to the gap between the interest rates charged to

credit and debt (Al Shubiri and Jamil, 2017). The gap between the rates of debt and assets is known as the spread rate (Ghasemi and Rostami, 2015).

The term “interest rate spread” (IRS) denotes the disparity between the interest rates received by depositors and the interest rates charged to borrowers (Were and Wambua, 2014). The interest rate spread also serves as a proxy for the bank’s payment for carrying on the risk of financing expenses and loan defaults. Numerous studies on the expansion of commercial banks have been conducted in established and developing countries as well, including Bangladesh, Kenya, Oman, Pakistan, Africa, Iran, and Indonesia. Compared to poor countries, developing countries have lower IRS rates. Because among a large part banks’ contributions to Kenya’s economic expansion, the country enjoys greater flexibility in interest rates. People’s savings in the African economy are decreased by the huge interest rate spread because of the low bank deposit rates. Additionally, because of the increase in lending rate, reduces the demand for loans. Lower growth in investments within the economy occurs in Bangladesh, however, as a result of a greater interest rate spread that reduces access to money for potential borrowers.

In Oman, more financial inclusion arises from higher competition in the banking industry, which affects the banking industry’s escalating interest rate spread. Lower investment expansion within the economy occurs in Bangladesh, however, as a consequence of a larger interest rate spread that reduces access to funds for prospective borrowers (Chirwa, 2001). Fund mobilization has been hindered by an increasing interest rate spread in countries that are developing because it discourages potential investors as well as savers from borrowing and saving. On the other hand, a decreased profit may assure a better money supply, encouraging bank efficiency and progress in the economy. The interest rate spread of banks will eventually be influenced by reforms to regulations in Indonesia (Wijaya et al., 2020). Therefore, according to the factors influencing it, the interest rate spread could appear significant or inadequate, in accordance with empirical data. The objective of the study is to determine the factors affecting the interest rate spread of private commercial banks in Bangladesh.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Credit Risk

In a study of factors influencing the interest rate spread in Kenya’s banking sector between 2002 and 2011, Were and Wambu (2014) found a significant relationship between credit risk and interest rate spread. This aligns with the findings of (Siddiqui, 2012; Kiptui, 2014; Anjom, 2021; Shrestha, 2022; and Subedi, 2022) who found that the increase in credit risk also increases the interest rate spread because banks bear a greater risk of default are more likely to seek higher interest rates from borrowers. Again a study by Hossain and Amin (2020) found that interest rate spread is negatively affected by credit risk. Another study by Crowley (2007) found that there is no significant effect of credit risk on the interest rate spread.

H₁: There is a significant positive impact of credit risk on interest rate spread.

2.2. Bank Size

Afzal and Mirza (2010) observed that bank size has a positive impact on the interest rate spread after analyzing factors affecting the interest rate spread of commercial banks in Pakistan from 2002 to 2011. This agrees with the findings of (Were and Wambu, 2014; Subedi, 2022; and Anjom, 2021) because large banks often possess potential cost benefits because of their economies of scale and market power. Again studies by (Miah et al., 2014; and Hossain and Amin, 2020) found that bank size negatively affects the interest rate spread.

H₂: There is a significant positive impact of bank size on interest rate spread.

2.3. Operating Cost Ratio

In a study of factors affecting the interest rate spread of 12 commercial banks in Nepal between 2010 and 2021, Subedi (2022) concluded that operational costs had a positive impact on the interest rate spread. This aligns with the findings of (Kiptui, 2014; Were and Wambu, 2014; Anjom, 2021; Miah et al., 2014; and Mwamtambulo and Ntulo, 2018). Banks have operating costs associated with lending as well as deposit collecting. An increase in operational costs is evidence of bank inefficiencies. When a bank has high operational costs, it wants to pass those costs on to its customers, which increases the IRS.

H₃: There is a significant positive impact of operating cost ratio on interest rate spread.

2.4. Liquidity Risk

A study conducted by Hailu (2016) examines eight Ethiopian commercial banks from 2004 to 2013 in order to determine the factors that affect the IRS and found that liquidity risk has a positive impact on the interest rate spread. This agrees with the findings of (Were and Wambu, 2014; Afzal and Mirza, 2010; Enendu, 2000; Njeri et al., 2015; Anjom, 2021; Subedi, 2022; Mwamtambulo and Ntulo, 2018; and Wijaya et al., 2020) because banks don’t charge a premium for greater liquidity as it reduces their risk of liquidity. This will result in a smaller spread in rate. Banks with less liquidity, on the other hand, would be more prone to liquidity risk and would thus need to charge a larger liquidity premium to offset the loss. As a result, there is a positive impact of liquidity risk on the banks’ interest rate spread.

H₄: There is a significant positive impact of liquidity risk on interest rate spread.

2.5. Net Interest Income as a Ratio of Total Income

In a study of factors influencing the interest rate spread of conventional commercial banks listed in Bangladesh between 2011 and 2019, Anjom (2021) observed that the interest rate spread is negatively but insignificantly impacted by net interest income as a ratio of total income. Again other studies by Leykun (2016), and Musah et al. (2018) found that there is a positive relationship between the net interest income to total income and interest rate

spread because being capable of issuing loans at larger interest rates leads to larger interest rate spreads for banks that largely depend on interest revenue rather than non-interest income.

H₅: There is a significant positive impact of net interest income as a ratio of total income on interest rate spread.

2.6. Capital Adequacy Ratio

According to a study by Ghasemi and Rostam (2016), the capital adequacy ratio has an adverse effect on the interest rate spread. The study analyzed the factors impacting a bank's interest rate spread during a 19-month period in Nepal. This aligns with the findings of (Hossain and Amin, 2020; Anjom, 2021; Wijaya et al., 2020) because higher capitalization banks may, however, allocate their resources to less risky investments, lowering the interest rate spread. According to another study by Shrestha (2022), the capital adequacy ratio has no significant impact on the interest rate spread.

H₆: There is a significant negative impact of the capital adequacy ratio on interest rate spread.

2.7. Loan to Deposit Ratio

The loan to deposit ratio has a negative effect on the interest rate spread, according to a study done by Hossain and Amin (2020) to explore the factors influencing the interest rate spread of the listed commercial banks in Bangladesh from 2011 to 2019. This agrees with the findings of Saidu (2023) because when the loan to deposit ratio increases, the funding cost, risk of the loan, and competition for deposits also increase thus as a result interest rate spread is affected negatively.

H₇: There is a significant negative impact of loan to deposit ratio on interest rate spread.

2.8. Inflation Rate

Inflation has a positive impact on the interest rate spread, according to a study by Enendu (2000) that looked at some selected banks in Nigeria between 1989 and 2000 to identify the factors influencing interest rate spreads. This is similar to the findings of (Nanjunga et al., 2004; Njeri et al., 2015; Hailu, 2016; Anjom, 2021; Subedi, 2022; and Shrestha, 2022) because if rates of lending and deposit are modified for the variations in inflation, then margins of interest could be affected and as a result interest rate spread increases. Again, Studies by (Crowley, 2007; Ghasemi and Rostam, 2016; and Hossain and Amin, 2020) observed that the interest rate spread is adversely affected by inflation. Another study by Were and Wambu (2014) found that there is no significant impact of inflation on interest rate spread.

H₈: There is a significant positive impact of inflation rate on interest rate spread.

2.9. Gross Domestic Product Growth (GDP)

GDP has a positive impact on the interest rate spread, according to Shrestha's (2022) study, which examines the factors influencing the interest rate spread (IRS) based on 25 commercial banks in Nepal from 2013 to 2021. This aligns with the findings of (Hossain and Amin, 2020; Afzal and Mirza, 2010; Enendu, 2000; Hailu,

2016; Kiptui, 2014; Anjom, 2021; Subedi, 2022; and Nanjunga et al., 2004) because a country's increased economic activity creates demand for loans, which drives up lending rates and thus as a result the interest rate spread increases. Studies by (Were and Wambu, 2014; and Al Shubiri and Jamil, 2017) found that there is no significant impact of GDP on the interest rate spread.

H₉: There is a significant positive impact of gross domestic product growth on interest rate spread.

3. DATA AND METHODS

Explanatory research has been employed to identify the factors affecting the interest rate spread of private commercial banks in Bangladesh since this study is quantitative in nature. Panel data has been used in this study, along with secondary data. Ten private commercial banks have been taken conveniently and 10 years of data from 2013 to 2022 have been collected (bank-specific variables from the respective bank's annual report and macroeconomic variables from the World Bank website). There are many studies available that use identical data for this kind of study (Enendu, 2000; Hailu 2016; Anjom 2021; Subedi, 2022; Shrestha, 2022; Crowley, 2007; Ghasemi and Rostam, 2016; Hossain and Amin, 2020). The considered key variables in this study are described in the following Table 1.

In Table 1 the independent variables are listed with descriptions while the dependent variable of the study is the difference between interest earned from loans/total loans and interest paid to deposits/total deposits. Since the study's dataset includes panel data, time-consistent unobservables that impact both dependent and significant independent variables, to investigate the relationship the study employed the ordinary least square method (OLS), fixed effect method (FE), random effect method (RE), and generalized least square method (GLS).

To analyze the impact of the independent variables on the interest rate spread of banks, an empirical model has been constructed. The model is:

$$IRS = \alpha + \beta_1 NPLR + \beta_2 LOGA + \beta_3 OPERAT + \beta_4 LR + \beta_5 INTERCOM + \beta_6 CAR + \beta_7 LDR + \beta_8 INF + \beta_9 GDP + \mu$$

Here, IRS = Interest Rate Spread for banks; α = Constant of the model; β = Coefficient of the explanatory variable; μ = Error term of the model.

More precisely, The empirical models have been constructed to estimate the impact of several determinants of interest rate spread as follows:

$$IRS_{it} = \alpha_{it} + \sum_{k=1}^{13} \beta_{it} X_{itk} + u_{it} \tag{i}$$

$$IRS_{it} = \alpha_{it} + \sum_{k=1}^{13} \beta_{it} X_{itk} + \varepsilon_{it} + u_{it} \tag{ii}$$

Since the study's dataset includes panel data, time-consistent unobservables that impact both dependent and significant

Table 1: Description of variables included in the model

Variables	Notations	Measurement method	Expected impact	References	Sources of data
Dependent variable					
Interest rate spread	IRS	IRS= (Interest earned from loans/Total loans)-(Interest paid to deposits/Total deposits)	n/a	(Anjom, 2021; Hossain and Amin, 2020; Subedi, 2022)	Annual report
Independent variables					
Credit risk	NPLR	Non-performing loan/total loan	Positive/negative	(Were and Wambu, 2014; Siddiqui, 2012; Anjom, 2021)	Annual report
Bank size	LOGA	Log value of the bank's assets	Positive/negative	(Hossain and Amin, 2020) (Afzal and Mirza, 2010; Subedi, 2022; Anjom, 2021) (Miah et al., 2014; Hossain and Amin, 2020)	Annual report
Operating cost ratio	OPERAT	Operating expense/total net operating income	Positive	(Subedi, 2022; Miah et al., 2014; Mwamtambulo and Ntulo, 2018)	Annual report
Liquidity risk	LR	Deposits/total liabilities	Positive	(Hailu, 2016; Enendu, 2000; Njeri et al., 2015)	Annual report
Net interest income as a ratio of total income	INTERCOM	Net interest income/Total income	Positive	(Leykun, 2016; Musah et al., 2018)	Annual report
Capital adequacy ratio	CAR	(Tier 1+Tier 2)/RWA	Negative	(Ghasemi and Rostam, 2016; Anjom, 2021; Wijaya et al., 2020)	Annual report
Loan to deposit ratio	LDR	Total loan/Total deposit	Negative	(Hossain and Amin, 2020; Saidu, 2023)	Annual report
Inflation	INF	Annual rate of inflation	Positive/Negative	(Enendu, 2000; Hailu, 2016; Anjom, 2021; Subedi, 2022; Shrestha, 2022) (Crowley, 2007; Ghasemi and Rostam, 2016; Hossain and Amin, 2020)	World Bank Website
Gross domestic product	GDP	Annual GDP growth rate	Positive	(Shrestha, 2022; Hossain and Amin, 2020; Afzal and Mirza, 2010; Kiptui, 2014; Anjom, 2021; Subedi, 2022)	World Bank Website

Source: Authors' contribution

independent variables, to investigate the relationship the study has estimated the coefficients of equation (i) using the ordinary least square method (OLS), fixed effect method (FE) and generalized least square method (GLS) respectively. In addition, our empirical section also estimates the coefficients for equation (ii) using random effect (RE) method.

4. EMPIRICAL RESULTS WITH DISCUSSION

4.1. Descriptive Statistics

The descriptive statistics for the model's variables, which allow us to determine their statistical characteristics, are presented in Table 2. All of the variables have very low standard deviations, with the exception of the ratio of net interest income as a ratio of total income and bank size, which have slightly higher deviations. It was observed that the gaps in ranges were moderate.

4.2. Empirical Results

Table 3 displays the coefficient values of the different variables considered in our model. As per the results, Bank size is found negatively significant and also found significant at a 1% level of significance in Pooled OLS, FE, RE, and GLS models which

provide conclusive evidence that an increase in the bank size reduces the interest rate spread. The result is similar to the findings of the paper by Miah et al. (2014), and Hossain and Amin (2020) and it is observed that there might be increasing competition for deposits to offer lower interest rates and face pressure to offer competitive lending rate by the large banks and it tends to reduce the interest rate spread.

The operating cost ratio is found negatively significant in Pooled OLS, and GLS models and also found to be significant at a 1% level of significance again, the operating cost ratio is found negatively significant in FE, and RE models and also found significant at a 5% level of significance which provides conclusive evidence that an increase in the operating cost plays a part in the reduction of interest rate spread as it is observed that with the increase in operating cost, the profit of banks reduces and thus banks lower the deposit interest rate or raise lending rate which reduces the interest rate spread. The result is not consistent with the findings of (Subedi, 2022; Miah et al., 2014; and Mwamtambulo and Ntulo, 2018).

Net interest income as a ratio of total income is found positively significant in Pooled OLS, FE, RE, and GLS models and also

Table 2: Descriptive statistics for each variable in the model

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
IRS	100	0.038066	0.0137757	0.0062	0.0758
NPLR	100	0.053994	0.0405779	0.0235	0.3307
LOGA	100	12.50521	0.3921102	11.3934	13.3504
OPERAT	100	0.419377	0.0972149	0.1832	0.6444
LR	100	0.812264	0.0677503	0.6628	0.9418
INTERCOM	100	0.296516	0.1210366	0.0832	0.6056
CAR	100	0.132385	0.0192493	0.0901	0.1793
LDR	100	0.910399	0.0961151	0.6895	1.1153
INF	100	0.062	0.0082756	0.055	0.077
GDP	100	0.06501	0.0115685	0.0345	0.0788

Source: Authors' contribution. IRS: Interest rate spread

Table 3: Output of coefficient of the model

Dependent variable: IRS (interest rate spread)	Estimation models			
	Ordinary least square (OLS)	Fixed effect (FE)	Random effect (RE)	Generalized least square (GLS)
Independent variables				
NPLR	0.00830376	0.00641474	0.00621002	0.00830376
LOGA	-0.01272258***	-0.01807766***	-0.01786402***	-0.01272258***
OPERAT	-0.05379527***	-0.0310094**	-0.03253531**	-0.05379527***
LR	-0.00464577	0.03680937	0.03141057	-0.00464577
INTERCOM	0.06102786***	0.05888163***	0.05804139***	0.06102786***
CAR	0.00301517	0.1338227**	0.12492152**	0.00301517
LDR	-0.0505682**	-0.07689879***	-0.0764696***	-0.0505682***
INF	0.2771661*	0.18968426**	0.18919461**	0.2771661*
GDP	0.02435347	0.08691273	0.08659378	0.02435347
Constant	0.23182514***	0.26431292***	0.26776541***	0.23182514***
Observations	100	100	100	100
Chi_square			451.57564	153.24232
F	15.324232	48.587612		
R ²	0.60512129	0.84371631		
sigma_u		0.00978971	0.01187156	
sigma_e		0.00486394	0.00486394	
Rho		0.80201996	0.85626318	

Source: Authors' estimations based on STATA. Note: *, **, *** respective significance levels of 10%, 5%, 1%. IRS: Interest rate spread

found significant at a 1% level of significance which provides conclusive evidence that an increase in the net interest income as a ratio of total income also increases the interest rate spread. This is consistent with the findings of the paper by Leykun (2016), and Musah et al. (2018) as it is found that for banks that mostly rely on interest revenue rather than non-interest income, the ability to issue loans at higher interest rates results in higher interest rate spreads.

Capital adequacy ratio is found positively significant in FE, and RE models and also found significant at a 5% level of significance which provides conclusive evidence that an increase in the capital adequacy ratio also increases the interest rate spread but capital adequacy ratio found to be insignificant in Pooled OLS and GLS models as it is observed that financially most stable banks are those with large capitalization, which lowers their funding costs and increases interest rate spread. The result is not similar to the findings of (Ghasemi and Rostam, 2016; Anjom, 2021; and Wijaya et al., 2020).

Loan to deposit ratio is found negatively significant in FE, RE, and GLS models and also found significant at a 1% level of significance again, the loan to deposit ratio is found negatively significant in the Pooled OLS model and also found to be significant at a 5% level of

significance which provides conclusive evidence that an increase in the loan to deposit plays a part in the reduction of interest rate spread. This result is consistent with the findings of the paper by Hossain and Amin (2020) and Saidu (2023) and it is found that a high loan to deposit ratio increases the funding cost as it requires additional funds to meet the demand for loans. Again, a high loan to deposit ratio also implies less liquidity position to meet demands of withdrawal and increase borrowing cost as well as raises risk perceptions thus it tends to reduce interest rate spread.

Inflation is found to be positively significant in FE, and RE models and also found to be significant at a 5% level of significance, and inflation is found to be positively significant in Pooled OLS and GLS models and also found to be significant at a 10% level of significance which provides conclusive evidence that an increase in the inflation also increases the interest rate spread. This result is similar to the findings of the paper by (Crowley, 2007; Ghasemi and Rostam, 2016; and Hossain and Amin, 2020), and it is observed that at times of increasing inflation, the central bank increases the interest rate to control the inflation and banks adjust loan rate faster than deposit rate and thus the spread between lending and deposit interest rate increases and so does the interest rate spread.

Table 4: Output of hausman test

Hausman Chi2 test (IRS)	
Chi_square	1.53
P-value	0.9969

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Table 5: Output of breusch and pagan lagrangian multiplier test

Lagrangian multiplier test (IRS)	
Chi_square	136.77
P-value	0.0000

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Table 6: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

Heteroskedasticity test (IRS)	
Chi_square	14.84
P-value	0.0001

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Table 7: Multicollinearity test

Variables	IRS	
	VIF	1/VIF
LDR	2.74	0.364412
LR	2.35	0.426208
LOGA	1.97	0.508308
INTERCOM	1.76	0.568219
NPLR	1.75	0.569852
CAR	1.69	0.591912
OPERAT	1.27	0.787657
INF	1.17	0.851929
GDP	1.11	0.897193
Mean VIF	1.76	

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Table 8: Wooldridge test for autocorrelation

Autocorrelation test (IRS)	
F (1, 9)	263.879
P-value	0.0000

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Table 9: Ramsey RESET test for omitted variable

Omitted variable bias test (IRS)	
F (3, 86)	1.01
P-value	0.3937

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Table 10: Pearson's correlation matrix test

Particulars	IRS	NPLR	LOGA	OPERAT	LR	INTERCOM	CAR	LDR	INF	GDP
IRS	1.00									
NPLR	-0.24	1.00								
LOGA	-0.51	0.09	1.00							
OPERAT	-0.50	0.23	0.29	1.00						
LR	0.41	-0.14	-0.61	-0.33	1.00					
INTERCOM	0.11	-0.26	0.34	0.21	-0.31	1.00				
CAR	-0.19	-0.40	0.42	0.17	-0.34	0.27	1.00			
LDR	-0.41	0.03	0.57	0.32	-0.66	0.57	0.26	1.00		
INF	0.29	-0.003	-0.22	-0.14	0.11	-0.20	-0.21	-0.31	1.00	
GDP	0.03	0.11	0.05	0.03	-0.04	0.22	-0.02	0.20	-0.07	1.00

Source: Authors' estimations based on STATA. IRS: Interest rate spread

Credit risk, Liquidity risk, and Gross domestic product were found to be insignificant across all the models, which signifies that these variables were insufficient in explaining the movement of interest rate spread for the selected private commercial banks. Lastly, all the constant values under the Pooled OLS, FE, RE, and GLS models were found to be significant under a 1% level of significance.

4.3. Model Specification Tests

4.3.1. Random effect (RE) versus fixed effect (FE)

The results of the Hausman test, which determines whether the fixed effect or random effect delivers a more accurate calculation of coefficients, are shown in Table 4. We can accept the null hypothesis and come to the conclusion that the Random effect model is superior to the Fixed effect model while finding the value to be 0.9969.

4.3.2. Random effect (RE) versus pooled OLS

In this study, the best model between the random effect model and the pooled OLS model is determined using the BP-LM test findings, which are displayed in Table 5. We can reject the null hypothesis and determine that the Random effect model performs better than the Pooled OLS model since the test yielded a P = 0.

4.4. Diagnostics Test

4.4.1. Test of heteroscedasticity

The findings of the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity, which examines the existence of nonconstant error variance, are displayed in Table 6. After deriving a P = 0.0001, we can reject the null hypothesis and come to the conclusion that the model suffers from heteroscedasticity.

4.4.2. Test of multicollinearity

Table 7 lists the variance inflation factor of the independent variables of our model in descending order based on value. The mean VIF was found to be 1.76, which is below 5. This lets us accept the null hypothesis and conclusively determine the absence of the multicollinearity problem in the model.

4.4.3. Test of autocorrelation

We can reject the null hypothesis and confirm that first-order autocorrelation exists in the model by looking at the results of the Wooldridge test for autocorrelation in Table 8, where the P-value was determined to be 0.

4.4.4. Test of omitted variable bias

The results of the Ramsey RESET test, which determines if any variables in the model have been left out, are displayed in Table 9. With the associated $P = 0.3937$, we can accept the null hypothesis and come to the conclusion that there is no omitted variable bias in the model.

4.5. Pairwise Correlation

The findings of the Pearson's correlation matrix test, which examines the relationship between the IRS and other independent variables, are shown in Table 10. The findings indicate a positive correlation between the IRS and Liquidity risk, Net interest income as a percentage of total revenue, Inflation, and GDP. Conversely, there is a reverse correlation between the IRS and credit risk, Bank size, Operating cost ratio, Capital adequacy ratio, and Loan to deposit ratio.

5. CONCLUSION WITH POLICY IMPLICATIONS

This study's goal, to identify the bank-specific and macroeconomic factors affecting the interest rate spread of Bangladesh's private commercial banks, has already been achieved. It conclusively determines that bank-specific factors i.e., net interest income as a ratio of total income, and capital adequacy ratio are found to be statistically significant, and positively impact the interest rate spread and bank size, operating expense ratio, and loan to deposit ratio are found to be statistically significant and negatively impact the interest rate spread. Again, it conclusively determines that between two macroeconomic factors, inflation is found to be statistically significant and positively impacts the interest rate spread. It conclusively determines that credit risk which is under bank-specific factors and gross domestic product which is under macroeconomic factors are found to be statistically insignificant and have no effect on interest rate spread. The positive relationship of the variables with the interest rate spread explains the rise in the variables such as net interest income as a ratio of total income, capital adequacy ratio, and inflation resulting in a rise in the interest rate spread and the negative relationship of the variables with the interest rate spread explains the rise in the variables such as bank size, operating expense ratio, and loan to deposit ratio resulting in a fall in the interest rate spread.

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