

Bridging the Rate Gap: Unraveling its Impact on Bank Profitability in Bangladesh

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Abstract: This study investigates the effect of interest rate spread (IRS) on the profitability of commercial banks in Bangladesh. The net interest margin (NIM) measures IRS; return on equity (ROE) and return on assets (ROA) are measures of profitability, net of bank size (SIZE); capital adequacy ratio (CAR); non-performing loans (NPL); and customer deposit growth (CDG). The panel data estimation method used for this study is Feasible Generalized Least Squares (FGLS), applied to panel data on conventional commercial banks for 135 bank-year observations from 2019 to 2023, with heteroskedasticity and first-order autocorrelation addressed. The results of the exploratory analysis show a positive correlation between NIM and ROE and ROA, which is statistically significant in the case of ROA at the 10% level. Also, capital adequacy (CAR) has a positive relationship with ROA, and the credit risk (NPL) has a negative relationship with shareholder returns (ROE). There is no statistically significant relationship between the size of the bank and profitability, and no relationship between growth of deposits and profitability. From the results, it can be seen that there is a need to manage interest margin and credit risk with the maintenance of capital in the banking sector of Bangladesh.

Keywords: Interest Rate Spread; Net Interest Margin; Profitability; Return on Equity; Return on Assets; Commercial Banks.

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I. INTRODUCTION

Bank profitability is fundamental to financial stability and economic development, making its determinants important to researchers, practitioners, and policymakers. Interest rate spread (IRS), or the difference in interest rates for lending and deposits, is of special interest because it is a measure of the intermediation role of banks and has a direct impact on their earnings, credit availability, resource allocation and economic activity. A broad spread can lead to higher net interest income and profitability, but too high a spread could lead to a reduction in borrowing, higher default risk, and reduced credit availability.

The banking sector in the country has been greatly modernized, but high interest rate spreads are still an issue. The possible impact of IRS on profitability has been found to differ from country to country and is influenced by operational costs, the risk of credit, market conditions, and the regulatory environment. Rates can also be higher to boost profits in terms of a higher net interest margin, but can also be a sign of inefficiency and limit private sector investment.

Although the importance of IRS cannot be overemphasized, little has been reported, especially in the context of the factors peculiar to banks, on the direct relationship between IRS and bank profitability in Bangladesh. This paper thus investigates the relationship between IRS and bank profitability, and incorporates bank size, CAR, NPL, and customer deposit growth.

Therefore, the present study focused on the impact of IRS on the profitability of commercial banks in Bangladesh with the help of NIM as a proxy indicator for IRS and ROE and ROA as indicators of profitability. Bank-specific factors are also included in the analysis, such as bank size, capital adequacy, non-performing loans, and customer deposit growth. The study employs panel data for 27 conventional commercial banks spanning 2019–2023 to offer empirical evidence for the IRS–profitability relationship and has practical implications for effective interest-rate management and credit-risk control.

II. LITERATURE REVIEW

Interest rate spread (IRS), representing the difference between lending and deposit rates, is an important indicator of banks' financial intermediation and a major determinant of their profitability. A wider spread can have a positive effect on banks' net interest income and profitability, but can also be a sign of higher operating costs, credit risk, information asymmetry, market power, and regulatory restrictions. The Ho-Saunders model accounts for bank interest margins based on interest-rate risk and the intermediation process, but later studies include other factors affecting margins such as market structure, regulation, operating costs, and risk conditions (Ho & Saunders, 1981; Saunders & Schumacher, 2000; Maudos & Fernández de Guevara, 2004).

Theoretically, IRS is related to bank profitability as banks need a margin for covering financial intermediation

costs and risks. Banks can also be constrained in their ability to hold on to wider margins by the structure of the market and the level of competition. Regulatory restrictions, reserve requirements, capital-to-asset ratios, market segmentation, and interest-rate volatility are reported to have a significant impact on bank NIMs by Saunders and Schumacher (2000). Similarly, Maudos and Fernández de Guevara (2004) demonstrate that the interest margin of banks is important, and that operating costs, credit risk, interest-rate risk, and market power are all important factors.

The empirical evidence on the correlation between interest margins and profitability is inconclusive. Demirgüç-Kunt and Huizinga (1999) illustrate the association between bank characteristics, macroeconomic conditions, taxes, regulations, financial structure, and institutional factors with the differences in interest margin and bank profitability based on bank-level data from 80 countries. In addition, Beck and Hesse (2009) demonstrate that high interest spreads can be indicators of high intermediation costs and institutional deficiencies, not efficiencies. So, while more spread could boost bank profits, it may not be profitable under all circumstances.

Other factors related to the banks also have an impact on profitability. Bigger banks might enjoy a higher degree of economies of scale, but asset quality and problem loans can drive up costs and dampen efficiency. The strength of capital may impact bank resilience and the pricing behavior of banks, whilst the condition of deposits will impact the availability of funding and the cost of funding. Bank characteristics and financial structure are also found to be significant factors affecting both margins and profitability in the Demirgüç-Kunt (1999) analysis, and problem loans are shown to be significant for bank cost efficiency by Berger and DeYoung (1997).

Overall, the literature suggests that the profitability effect of IRS depends on the interaction of interest margins with operating efficiency, credit risk, market conditions, regulation, and bank-specific characteristics. Therefore, examining IRS alongside bank size, capital adequacy, non-performing loans, and customer deposit growth provides a more comprehensive assessment of its relationship with bank profitability.

➤ Hypothesis 1:

Interest Rate Spread (as measured by NIM) is positively associated with bank profitability (as measured by ROE or ROA).

III. METHODOLOGY

This study adopts a quantitative approach to examine the relationship between interest rate spread (IRS) and bank

profitability in Bangladesh. The secondary data were obtained from commercial bank annual reports for the period of 2019–2023. The study recruited 36 commercial banks, but nine Islamic banks were excluded because of their distinct operational and financial structures under Shariah guidelines. There are 27 conventional commercial banks in the final sample and 135 bank-year observations.

The model variables used in this study are described below with the summary presented in table A in Appendix A. Net Interest Margin (NIM) is used as the independent variable to calculate Interest Rate Spread. Bank profitability measures used include Return on Assets (ROA) and Return on Equity (ROE). The analysis also includes the following control variables: Customer Deposit Growth (CDG), Bank Size (SIZE), and Non-Performing Loans (NPL), as well as the Capital Adequacy Ratio (CAR). The other variables are financial ratios or annual growth rates, and size is the natural log of total assets.

➤ Model 1:

$$ROE_{it} = \beta_0 + \beta_1 NIM_{it} + \beta_2 SIZE_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 CDG_{it} + \epsilon_{it}$$

➤ Model 2:

$$ROA_{it} = \beta_0 + \beta_1 NIM_{it} + \beta_2 SIZE_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 CDG_{it} + \epsilon_{it}$$

The dual analytical framework provides comprehensive understanding about how interest rate spread impacts multiple aspects of bank profitability with results that are both reliable and applicable to the Bangladeshi banking industry.

IV. RESULTS AND ANALYSIS

➤ Descriptive Statistics

Descriptive statistics for the study variables are provided in Table 1 for 135 observations from bank years. The generally positive net interest margin profitability is reflected in the mean values of ROE (0.0824), ROA (0.0068), and NIM (0.0160). The average size of the companies is 5.4994, with the average CAR being 0.1411, which indicates that the capital situation of these companies is relatively stable. The mean NPL is 0.0633, showing the spread of credit risk among banks, while Customer Deposit Growth (CDG) is 0.1050. The descriptive analysis shows that the sampled banks have distinguishable differences in performance, especially profitability, NPL, and deposit growth. Analysis based on winsorized values to minimize the effect of outliers.

Table 1 Descriptive Statistics

Var.	Mean	SD	Min.	Max.
ROE	0.0824	0.0991	-0.6370	0.1791
ROA	0.0068	0.0053	-0.0264	0.0136
NIM	0.0160	0.0095	-0.0190	0.0375
SIZE	5.4994	0.2701	4.7382	5.9125

CAR	0.1411	0.0251	0.0499	0.2042
NPL	0.0633	0.0525	0.0029	0.2923
CDG	0.1050	0.0774	-0.0563	0.3162

➤ Correlation Matrix

Pearson correlation was used to analyze the bivariate correlation among the study variables. Table 2 presents the pair wise Pearson correlation coefficients of all variables used for 27 commercial banks over the period 2019 to 2023. The results mostly align with prior expectations and do not contain extreme values indicative of multicollinearity. NIM is found to have a significant positive correlation with ROE ($r = 0.586$, $p < 0.01$) and ROA ($r = 0.645$, $p < 0.01$),

suggesting that higher net interest margins are associated with higher profitability of banks. CAR is also positively correlated with ROE ($r = 0.406$, $p < 0.01$) and ROA ($r = 0.581$, $p < 0.01$), while NPL exhibits significant negative correlations with ROE ($r = -0.577$, $p < 0.01$), ROA ($r = -0.684$, $p < 0.01$), and NIM ($r = -0.452$, $p < 0.01$). Overall, the correlations suggest some preliminary evidence of the relationships between profitability, interest margin, and control variables.

Table 2 Correlation Matrix

	ROE	ROA	NIM	SIZE	CAR	NPL	CDG
ROE	1						
ROA	0.8995	1					
NIM	0.5859	0.6452	1				
SIZE	0.0134	-0.2205	-0.1608	1			
CAR	0.4056	0.5815	0.5271	-0.2651	1		
NPL	-0.5773	-0.6839	-0.4524	0.3733	-0.7028	1	
CDG	0.2412	0.2551	0.2701	-0.0311	0.1018	-0.2049	1

➤ Multicollinearity & Model Selection

The VIF test reveals that there are no significant multicollinearity issues among the set of explanatory variables, as VIF values range from 1.11 to 2.26 with an average value of 1.65.

The Breusch–Pagan/Cook–Weisberg test suggests that there is significant heteroscedasticity in both Model 1 and Model 2 ($p < 0.001$), so robust estimation is required.

The Hausman test is significant for both Model 1 ($\chi^2 = 23.36$, $p = 0.0003$) and Model 2 ($\chi^2 = 14.04$, $p = 0.0153$), supporting the fixed-effects model for both specifications.

➤ Regression Analysis

This paper evaluates how interest rate spread influences banking profitability through evidence collected from the Bangladesh banking sector. The relationship between interest rate spread and bank profitability and how firm-specific features such as bank size and customer deposits act as moderators was analyzed through a fixed-effect panel regression analysis. The decision to utilize fixed-effects emerged from Hausman test outcomes for robust treatment of unnoticed heterogeneity. The analysis included bank-specific and year-specific fixation effects to handle steady conditions and temporal disturbances.

Table 3 Regression Results Using Fixed Effect Model

Dependent Variable	Model 1: ROE	Model 2: ROA				
	Coefficient	t-statistic	p> t 	Coefficient	t-statistic	p> t
NIM	4.6049	2.11	0.044	0.2146	1.98	0.058
SIZE	0.1662	1.68	0.106	0.0049	0.91	0.373
CAR	1.0540	1.35	0.19	0.0717	1.89	0.07
NPL	-1.2269	-2.11	0.045	-0.0581	-1.95	0.062
CDG	0.0380	0.55	0.589	-0.0023	-0.52	0.607
Constant	-0.9805	-1.6	0.122	-0.0299	-0.93	0.361
Observations	135	135	135	135	135	135
Number of banks	27	27	27	27	27	27
R-squared	0.4796			0.5617		
Prob>F	0.2665			0.0929		

The fixed-effects regression results of Model 1 with ROE as the dependent variable indicate that Net Interest Margin (NIM) is positively related to the profitability of the banks and is also statistically significant. The coefficient of NIM is 4.6049, and the p-value is 0.044, which means that NIM has a positive impact. It might be thought that banks with higher net interest margins would have higher returns

for shareholders. The results of the statistical significance of NIM at the 5% level showed that there is a positive relationship between interest rate spread and bank profitability. Bank Size is positively related to ROE ($\beta = 0.1662$, $p = 0.106$), but the relationship is not statistically significant, indicating that there may be some scale economies for larger banks, but it is not a strong enough

relationship to establish a significant relationship. Likewise, CAR has a positive correlation with ROE ($\beta = 1.0540$, $p = 0.190$), meaning better capital positions could be associated with better profitability, but the correlation is not statistically significant. A significant negative relationship exists between NPL and ROE ($\beta = -1.2269$, $p = 0.045$), indicating that an increase in NPL negatively affects the shareholders' return. There is a positive but insignificant correlation between Customer Deposit Growth and ROE ($\beta = 0.0380$, $p = 0.589$). The model accounts for around 47.96% of the variance in ROE, and the overall F-statistic is not statistically significant ($p = 0.2665$).

In Model 2, the dependent variable is ROA, and NIM is brought to show a positive relationship with bank profitability, the coefficient of which is 0.2146 ($p = 0.058$). The relationship is not statistically significant at the 5% level; however, it is on the margin at the 10% level, indicating that there is a positive correlation between interest margin and ROA. This finding is in line with the positive relationship found in Model 1 and confirms that NIM continues to be an important determinant of the variation in bank profitability. Model 2 (control variables) shows mixed results. Bank Size is positively correlated with ROA, but the correlation is not statistically significant ($\beta = 0.0049$, $p = 0.373$), suggesting that bank size does not have a significant impact on asset profitability. It is observed that there exists a positive and marginally significant relationship between CAR and ROA ($\beta = 0.0717$, $p = 0.070$), which may indicate that better capital adequacy is aiding banks' profitability. The correlation between NPL and ROA is negative ($\beta = -0.0581$, $p = 0.062$), but not statistically significant at the 5% level. The effect of customer deposit growth on ROA is also negative and not statistically significant ($\beta = -0.0023$, $p = 0.607$). Model 2 accounts for about 56.17% of the variation in ROA; the overall F-statistic is marginally significant at the 10% level ($p = 0.0929$).

Overall, the results of the fixed-effects tests support the hypothesized positive relationship between NIM and bank profitability, as there is a positive association between the two. NIM's significance is higher in Model 1 than in Model 2, which implies that the relationship of the changes in the interest margin with shareholder return is stronger than the relationship of the changes in NIM with the return on bank assets; however, as Model 1 exhibits an insignificant overall F-statistic ($p = 0.2665$), these preliminary FE findings must be interpreted with caution until adjusted for error structure issues.

The Modified Wald test was used to test for groupwise heteroscedasticity as a measure of the reliability of the fixed-effects estimation. The test results are significant for both Model 1 ($\chi^2 = 19,738.79$, $p < 0.001$) and Model 2 ($\chi^2 = 9,006.53$, $p < 0.001$), leading to rejection of the null hypothesis of homoskedasticity. This means that there are significant variations in error variance among the banks sampled. In addition, the Wooldridge test identifies first-order autocorrelation in both Model 1 ($\chi^2 = 93.644$, $p < 0.001$) and Model 2 ($\chi^2 = 17.287$, $p = 0.0003$). Typical standard errors may be compromised by the presence of both groupwise heteroscedasticity and serial correlation. To overcome these error-structure problems, Feasible Generalized Least Squares (FGLS) was used to get more reliable estimates.

➤ Feasible Generalized Least Squares (FGLS)

The results from the FGLS (Feasible Generalized Least Squares) regression analyze the impact of various explanatory variables on bank profitability, using two different dependent variables: ROE (Return on Equity) in the first model and ROA (Return on Assets) in the second model. The FGLS method accounts for heteroskedasticity and cross-sectional correlation, ensuring more robust and reliable estimates.

Table 4 Regression Results of the Feasible Generalized Least Squares

Dependent Variable	Model 1: ROE	Model 2: ROA				
	Coefficient	z-statistic	p> z	Coefficient	z-statistic	p> z
NIM	1.3635	0.76	0.45	0.1646	1.89	0.059
SIZE	-0.0166	-0.25	0.81	-0.0026	-0.72	0.47
CAR	0.2197	0.35	0.728	0.0847	2.04	0.041
NPL	-0.4515	-1.84	0.066	-0.0259	-0.77	0.443
CDG	0.0641	0.6	0.545	-0.0050	-0.49	0.625
Constant	0.12996	0.36	0.71	0.0067	0.3	0.762
Observations	135	135	135	135	135	135
Number of banks	27	27	27	27	27	27
Autocorrelation Coefficient	0.5529			0.4209		
Wald chi-squared	11.52			19.49		
Prob> chi ²	0.042			0.0016		

Given that the fixed-effects models contained groupwise heteroscedasticity and first-order autocorrelation, the Feasible Generalized Least Squares (FGLS) method was used to obtain more reliable estimates for these models, taking these error-structure issues into consideration. The

coefficient of NIM is positive (1.3635) in Model 1 (ROE), meaning that an increase in NIM is related to an increase in ROE. The signs of the relationship are positive, but the relationship is not statistically significant, as the p-value is 0.450. This indicates that the relationship between the

interest rate spread and profitability based on equity is not strong enough, while the error structure has been disturbed by the factors identified. Among the control variables, Bank Size is statistically insignificant, where $\beta = -0.0166$ and the p-value is 0.810. The coefficient (β) of capital adequacy is positive but insignificant in the estimation of FGLS, as there is a p-value of 0.728. NPL shows a negative relationship with ROE ($\beta = -0.4515$, $p = 0.066$), which is statistically significant at the 10% level, indicating that an increase in credit risk can negatively impact shareholder returns. Customer Deposit Growth has a positive but not statistically significant effect ($\beta = 0.0641$, $p = 0.545$). The Wald test is statistically significant ($p = 0.042$), meaning that the explanatory variables add up collectively to the model.

NIM shows a positive correlation with profitability for Model 2 ($\beta = 0.1646$, $p = 0.059$). The findings are statistically significant at the 10% level and suggest that there is a positive association between net interest margin (NIM) and ROA. This discovery gives relatively greater support to the connection between interest rate spread and asset-based profitability than the ROE model does. Bank Size does not have a statistically significant relationship with ROA ($\beta = -0.0026$, $p = 0.470$), whereas CAR shows a positive and statistically significant relationship with ROA ($\beta = 0.0847$, $p = 0.041$). This indicates that better capital adequacy has a positive effect on asset-based profitability. The other control variables in Model 2 do not show statistically significant relationships with ROA. NPL has a negative and insignificant coefficient ($\beta = -0.0259$, $p = 0.443$), and so is the relationship of Customer Deposit Growth, which is negative and insignificant ($\beta = -0.0050$, $p = 0.625$). Model 2 is statistically significant overall ($p = 0.0016$), suggesting that the model was significant overall. In general, the FGLS test shows a positive relationship between NIM and ROE and ROA, but only statistically significant at the 10% level with ROA. Thus, the findings provide partial support for H1, particularly through the ROA measure of bank profitability.

V. CONCLUSION

This study aimed to examine the relationship between the difference in bank interest rates and bank profitability in the context of 27 commercial banks available in Bangladesh over the time period 2019-2023. Spread of interest rates was measured using Net Interest Margin (NIM), and the profitability of banks was measured using Return on Equity (ROE) and Return on Assets (ROA). The analysis included the following control variables: bank size, capital adequacy, NPL, and growth in customer deposits. First of all, fixed-effects estimation was employed, and then FGLS estimation was employed to take into consideration the panel data found to be groupwise heteroscedastic and first-order autocorrelated.

The results suggest that there exists a positive association between NIM and the banks' profitability measures. The first fixed-effects analysis showed that the ROE model was significant statistically and that there was a positive correlation between NIM and ROE, and this result was also verified in the overall analysis, but there must be a

little care for the interpretation of the overall ROE model. Positive NIM coefficients are still found in the results of the FGLS estimation, although it is observed that the problem in the error structure has been identified. For ROE, this impact is not statistically significant, but only marginally statistically significant for ROA. Thus, the results partially support hypothesis H1 – that the relation between an interest rate spread and profitability exists – and, in the main respect – related to the asset return of the banks. The results also show that there are other bank-specific factors that affect profitability. Specifically, NPL is negatively associated with profitability, and CAR is positively associated with ROA, highlighting the importance of credit exposure management and maintaining sufficient capital buffers to improve a bank's performance.

Policy implications of the study are crucial to the financial sector and bank management in Bangladesh. Instead of striving to have an excessively large interest margin, bank managers should be more focused on keeping a proper margin, as this may have a negative impact on lending and financial efficiency. Meanwhile, improving credit risk management and safeguarding sufficient capital buffers can help promote sustainable profitability. At the policy level, managing interest rates, ensuring financial stability, and the provision of credit should all be considered to ensure the banking sector is resilient.

While the study is enriched with contributions, there are some limitations. The figures in the analysis are for five years (2019-2023) and only include conventional commercial banks, which may not fully represent the overall banking sector. The analysis could be extended over a longer time period, include Islamic banks, and be compared across countries, as well as adding more macroeconomic and bank-specific variables. Other indexes of profitability, like Tobin's Q or indexes based on the stock market, may also provide additional clues to the interest rate spread-bank performance connection.

Overall, the study is valuable in the literature and provides empirical evidence of the impact of interest rate spread on bank profitability in the context of Bangladesh. It is clear from the evidence that good interest margin management by the banks alongside strong capital adequacy and sensible credit risk management are important factors that can contribute to sustainable bank performance. The implications of these results are important for bank managers and policymakers interested in improving the profitability and stability of the banking sector in Bangladesh.

REFERENCES

- [1]. Athanasoglou, P. P., Delis, M. D., & Staikouras, C. K. (2008). Determinants of bank profitability in the South Eastern European region. *Journal of Financial Decision Making*, 2, 1–17.
- [2]. Beck, T., & Hesse, H. (2009). Why are interest spreads so high in Uganda? *Journal of Development Economics*, 88(2), 192–204.

- [3]. Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, 21(6), 849–870.
- [4]. Claessens, S., Coleman, N., & Donnelly, M. (2018). “Low-for-long” interest rates and banks’ interest margins and profitability: Cross-country evidence. *Journal of Financial Intermediation*, 35, 1–16.
- [5]. Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review*, 13(2), 379–408.
- [6]. Gambacorta, L., & Shin, H. S. (2018). Why bank capital matters for monetary policy. *Journal of Financial Intermediation*, 35, 17–29.
- [7]. Ho, T. S. Y., & Saunders, A. (1981). The determinants of bank interest margins: Theory and empirical evidence. *Journal of Financial and Quantitative Analysis*, 16(4), 581–600.
- [8]. Maudos, J., & Fernández de Guevara, J. (2004). Factors explaining the interest margin in the banking sectors of the European Union. *Journal of Banking & Finance*, 28(9), 2259–2281.
- [9]. Saunders, A., & Schumacher, L. (2000). The determinants of bank interest rate margins: An international study. *Journal of International Money and Finance*, 19(6), 813–832.

APPENDICES➤ *Appendix A*

Table A. Definition of Variables

Dependent Variables		
Return on Assets (ROA)	Net Income After Tax divided by Total Assets.	Athanasoglou, Delis, & Staikouras, 2008
Return on Equity (ROE)	Net Income After Tax divided by Total Equity.	Berger & DeYoung, 1997; Demirgüç-Kunt & Huizinga, 1999
Independent Variable		
Net Interest Margin (NIM)	Net Interest Income divided by Average Earning Assets.	Saunders & Schumacher, 2000; Beck & Hesse, 2009
Control Variables		
Bank Size (SIZE)	Natural Logarithm of Total Assets.	Claessens, Coleman, & Donnelly, 2018
Capital Adequacy Ratio (CAR)	Ratio of a bank's capital to its risk-weighted assets.	Gambacorta & Shin, 2018
Non-Performing Loans (NPL)	Ratio of Non-Performing Loans to Total Loans.	Athanasoglou, Delis, & Staikouras, 2008
Customer Deposit Growth (CDG)	Annual percentage growth in total customer deposits.	Maudos & Fernández de Guevara, 2004