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FACTORS AFFECTING THE INTEREST MARGIN OF PRIVATE AND PUBLIC LIMITED COMMERCIAL BANKS OF BANGLADESH

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Abstract

This study examines the determinants of net interest margin (NIM) in private and public limited commercial banks in Bangladesh over the period 2009–2018. Using a balanced panel dataset of 15 banks (12 private and 3 public), the analysis investigates the effects of bank-specific factors, macroeconomic conditions, and financial structure variables on interest margin behavior. Islamic banks were excluded due to their non-interest-based operations, while foreign banks were omitted because of data limitations. Net interest margin is employed as the sole measure of bank profitability, and pooled Ordinary Least Squares (OLS) estimation is applied. The empirical results show that overhead costs, asset quality, and non-interest-bearing assets have a positive and statistically significant impact on NIM, whereas bank concentration exerts a significant negative effect. Among macroeconomic variables, inflation positively influences NIM, while GDP growth is associated with lower margins. Sub-sample analysis reveals notable differences between private and public banks in the magnitude and significance of these determinants. The findings highlight the importance of operational efficiency, asset quality management, and market structure in shaping banks' interest margins and offer useful implications for bank managers, policymakers, and regulators in Bangladesh.

Keywords: Interest Margin, Net Interest Margin (NIM), Commercial Banks, Bangladesh.

1. Introduction

Banking sector of a country is the significant role player in the economy. Banks are the financial institutions that control the monetary policy and maintain the balance of the deposits and loans. The regulation of the financial system of a country depends mostly on banks. Banks, especially commercial banks, not only maintain deposits and loans but also provide proper guidelines for the investments in different sectors

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to the clients. That is why a country's growth usually depends on the efficiency of the banking sector. A sound and efficient banking sector can ensure a stable financial system of a country. Efficiency in the banking system can withstand the financial obstacles and can maintain the stability of the financial position of a country. As an emerging country like Bangladesh, the performance of the banking sector must ensure efficiency and effectiveness. That will assist the country to cope with the modern trade and commerce system.

Before the independence of Bangladesh, twelve banks with thousand branches operated the whole banking system. After independence, the establishment of Bangladesh Bank inaugurated the first independent banking system in the country. At that time, the country started its journey with six nationalized commercial banks, two state-owned specialized banks, and three foreign banks. But they were not enough for the expansion of the economy at that time. In the 1980s, the Government permitted the de-nationalization of banks so that Private Commercial Banks can start their journey in Bangladesh.

As an emerging economy like Bangladesh, the banking sector is the significant financial intermediary that provides various services to the clients. In Bangladesh, four types of banks are maintaining their operations and the total number of banks is 60. The four types of banks are Public Limited Commercial Banks (6), Private Commercial Banks (43), Specialized Banks (2) and Foreign Commercial Banks (9). Because of the different types of banks, their performance is needed to be analyzed and monitored to ensure the effectiveness of the banking sector.

In this globalized world, technology is developing and the trade and commerce system is improving day by day. Because of the technological advancement, the costs of the banking activities are reducing. But in Bangladesh, the performance of the banks is not at all satisfactory because of the lack of implementation of the banking policy and inefficient costing system. Since the banking sector is the chief financial sector in Bangladesh, the economy of the country may face unpredictable risks in the future.

The banking sectors earn their profits from the difference between the interest collected from the borrowing amounts and the interest provided on the deposited amounts. The difference is called spread. Therefore, interest income is the main source of the profit of the banks. Various determinants like bank-specific determinants, macroeconomic determinants, and financial structure determinants affect the interest margin of the commercial banks. This study will show the effect of bank-specific, macroeconomic and financial structure variables on the interest margin of both private and public limited commercial banks of Bangladesh throughout 2009-2018.

2. Literature Review

Several studies underscore the role of internal factors in shaping performance. Bennaceur and Goaied (2008), using Tunisian data (1980–2000), identify overhead costs and asset quality as significant drivers of profitability, while macroeconomic conditions were largely irrelevant. Similarly, Alper and Anbar (2011) show that in Turkey (2002–2010), bank size positively influences both ROA and ROE, whereas higher loan-to-asset ratios reduce performance. In Bangladesh, Hoque *et al.* (2013) demonstrate that corporate governance also matters, finding that audit committee meetings, independent directors, and director ownership positively affect performance.

Other studies link capital structure and efficiency. Sovbetov (2013) finds a negative relationship between capital structure and profitability in major UK banks, while Bandaranayake and Jayasinghe (2014) show that capital adequacy, operating expenses, and non-performing loans significantly influence efficiency in Sri Lanka. Roy (2015) similarly highlights the detrimental effect of non-performing loans on Bangladeshi banks' profitability. Research in Nepal (Pradhan & Pokharel, 2016) confirms that debt-to-asset ratios reduce returns, while credit risk and bank size support stronger outcomes.

Macroeconomic conditions exert mixed effects. Aburime (2008) emphasizes that monetary policy, real interest rates, and inflation boost Nigerian banks' profitability, though exchange market liberalization reduces it. In contrast, Bennaceur and Goaied (2008) and Alper and Anbar (2011) find GDP growth and inflation insignificant in Tunisia and Turkey, respectively. Heffernan and Fu (2008) reveal that in China, real GDP growth and unemployment significantly shape bank performance, with rural banks outperforming others.

Country-specific regulatory frameworks also matter. Naceur and Omran (2010), studying 175 MENA-region banks, show that equity-to-assets ratios, credit risk, and reserve costs raise margins and profits, while inflation reduces overhead costs. Bank concentration exerts a negative effect on profitability, suggesting competitive pressure improves efficiency. Similarly, Olajide *et al.* (2011) find that bank-specific but not industry structure variables drive Nigerian banks' profitability.

Differences between banking models are also explored. Hanif *et al.* (2011), comparing conventional and Islamic banks in Pakistan, report that conventional banks perform better in profitability and liquidity management, while Islamic banks excel in credit risk management and solvency. Kalakkar (2012) in India argues that both public and private banks should enhance share market investment and increase investment-to-deposit ratios to improve performance.

Net Interest Margin (NIM) continues to be recognized as a key performance indicator in many cross-country banking studies. For example, Sarpong *et al.* (2011), examining Ghanaian banks, reported that operating expenses, market share, and lagged non-performing loans are major drivers of interest spreads, while macroeconomic factors showed little influence. In Indonesia, Sidabalok (2012) identified spread and market power as significant determinants of NIM, whereas in Austria, Gunter *et al.* (2013) highlighted the roles of GDP growth, loan-loss provisions, and competition (measured by the Lerner index). Likewise, Hussain and Fugar (2012) found a positive link between NIM and market concentration across South and Southeast Asian banking systems.

In crisis contexts, Derbali (2011) reveals that Tunisian banks' equity and credit risk improved margins during 2003–2010, while concentration and stock market capitalization further strengthened stability. Busch and Memmel (2015) demonstrate that interest rate levels directly influence German banks' margins, with higher rates boosting profitability. Williams and Rajaguru (2010) and Vithyea (2014) highlight the trade-off between non-interest income and interest margins, suggesting banks must balance both streams to sustain profitability.

Credit and liquidity management frequently emerge as determinants. Hanweck and Ryu (2005) establish that credit risk and interest rate shocks significantly influence margins across specialized U.S. banking groups. Sharma and Gounder (2012) report that in Fiji, NIM rises with operating costs, credit risk, and market power, but falls with liquidity risk and poor management. G.R.M. and Yogendrarajah (2014) demonstrate in Sri Lanka that cash ratios positively affect profitability, indicating strong links between working capital management and returns.

Cross-regional research has expanded the understanding of banking dynamics. Arias *et al.* (2013), in an analysis of 78 Latin American banks, reported that size and capital strengthen performance, while credit risk and administrative inefficiency weaken it. Fungáčová and Poghosyan (2009) confirmed the importance of credit risk, bank size, and market concentration in shaping Russian banks' NIM. Likewise, Osuagwu (2014), examining Nigerian banks over a 30-year period, observed mixed influences of both institution-specific and macroeconomic factors on interest margins and returns.

Efficiency and diversification have also attracted attention. Haslem *et al.* (2015) argue that high-performing U.S. banks maintain stable profitability and lower costs. Busch and Kick (2009) find that German banks relying on fee-based income charge lower interest margins, suggesting diversification moderates spreads.

Kingi & Muriu (2021) examined East African commercial banks and found that operational efficiency, credit risk, and macroeconomic fundamentals remain dominant predictors of NIM. Their findings reinforce the significance of internal bank-specific variables in shaping interest margins.

Nguyen (2020) showed that increased competition and technological innovation tend to reduce NIM in Southeast Asian markets, emphasizing the role of market structure and digital transformation in profitability dynamics.

Sanya & Gaertner (2021) observed that financial structure variables, especially market concentration and regulatory constraints, significantly influence banks' ability to maintain stable margins in emerging economies.

Rahman & Sultana (2022) conducted a Bangladesh-focused study and reported that rising non-performing loans and weak governance reduce NIM, supporting the need to incorporate risk-sensitive indicators into margin analysis.

Hussein *et al.* (2023) highlighted that inflation uncertainty and interest rate volatility reshape banks' pricing behavior, leading to significant variation in margins across developing economies.

Overall, the literature demonstrates that bank profitability and interest margins are shaped by a complex interplay of internal management, capital structures, regulatory policies, and macroeconomic environments. Bank-specific factors—such as size, credit risk, and governance—consistently show significant effects across contexts. Macroeconomic influences, however, are mixed: in some countries (e.g., Nigeria, China), growth and inflation shape profitability, while in others (e.g., Tunisia, Turkey), they appear irrelevant. Crisis conditions, regulatory frameworks, and structural reforms further modify outcomes.

The evidence suggests that sustainable bank profitability depends not only on internal efficiency but also on adapting to broader regulatory and macroeconomic conditions. Future research could further explore how globalization, technological change, and evolving financial reforms reshape the determinants of bank margins and profitability across diverse contexts.

3. Methodology

3.1 Research Design and Data Structure

This study uses a balanced panel dataset consisting of 15 Bangladeshi commercial banks observed over ten years (2009–2018), totaling 150 bank-year observations. The sample includes both private and public commercial banks. Islamic banks were excluded due to their non-interest-based operations, and foreign banks were excluded due to incomplete data. Data were sourced from audited annual reports, Bangladesh Bank publications, and the World Bank database. The use of panel data allows simultaneous capture of cross-sectional and time-series variation.

3.2 Dependent Variable

The study focuses exclusively on Net Interest Margin (NIM), in line with the research objective and reviewer recommendation.

NIM is calculated as:

$$NIM_{it} = \frac{Net\ Interest\ Income_{it}}{Total\ Assets_{it}}$$

where:

i = bank (i = 1, …, 15)

t = year (t = 2009, …, 2018)

NIM measures how efficiently a bank converts its earning assets into interest-based income.

3.3 Independent Variables

Independent variables are the factors expected to influence or explain changes in the dependent variables. In this study, they represent the conditions that may shape the net interest margin (NIM) of Bangladeshi banks. They include bank-specific indicators, macroeconomic measures, and one financial-structure factor. Each variable is defined and explained in the following subsections.

3.3.1 Bank-specific Variables

There are significant bank-specific variables that can have impact on the dependent variables. Some of the variables are overhead cost, capital adequacy, asset quality and non-interest bearing asset. Bank-specific variables are also known as internal variables.

1. **Overhead Cost:** It is not a direct cost. But this cost helps the management of the bank to efficiently increase the profit by taking the investment and organizational decisions. Overhead is calculated by salary expenses divided by total assets. This cost can be fixed or variable depending on the types of

organizations. This is one of the costs that are not directly related to the production of the company.

2. **Capital Adequacy:** Capital adequacy represents a bank's financial strength and risk tolerance. It is commonly measured by the ratio of total shareholders' equity to total assets. A higher capital adequacy ratio indicates that the institution is better positioned to absorb potential losses and remain solvent in a competitive market. For banks, this ratio also signals the safety of depositors' funds, as a well-capitalized institution is more capable of meeting its financial obligations.
3. **Asset Quality:** Asset quality (AQ) ratio measures the credit risk of an organization. For a bank, this ratio assists the management to organize and control the credit risks of the particular assets of the bank in an efficient way. This ratio helps the bank or the other companies to achieve credit rating in the market. The lower the asset quality ratio, the higher the efficiency and lower the risk of loanable assets.
4. **Non-interest Bearing Asset:** There are various non-interest bearing assets in the banking sector. They are cash and cash equivalents, balance with other banks, fixed assets, and other assets. This ratio is calculated by non-interest bearing asset to total assets. Here, the higher the ratio, the lower will be the interest margin and profitability of the banks in the market.

3.3.2 Macroeconomic Variables

Macroeconomic indicators represent external conditions that can influence the profitability and interest margins of commercial banks. In this study, the selected macroeconomic factors are gross domestic product (GDP) growth rate, inflation (INF), and the real interest rate (RIR). Each is defined as follows:

1. **GDP Growth:** Gross domestic product growth reflects the pace at which a nation's economy expands or contracts. It is typically assessed by comparing the current GDP growth rate with previous periods. A stronger GDP growth rate is generally associated with higher bank profitability and wider interest margins, as economic expansion can increase demand for loans and other banking services.
2. **Inflation:** Inflation represents the rise in the overall price level of goods and services, which leads to a decline in purchasing power. When inflation is moderate and predictable, banks can adjust lending rates to maintain profitability, and research often shows a positive relationship between inflation and interest margins. However, unpredictable or excessive inflation may increase uncertainty and operating risks for banks.
3. **Real Interest Rate:** Real interest rate refers to the rate, which is adjusted by removing the impact of inflation in order to calculate the funds' real cost to the borrower and real return to the loan provider. Different studies have found that real interest rates have positive impact on the interest margin and profitability of the banks.

3.4 Financial Structure Variable

1. Bank Concentration: Bank concentration is calculated by total asset of individual banks divided by the total assets of three large commercial banks. Some recent studies have found that bank concentration have positive impact on the interest margin and profitability of the banks.

Table 1: Definitions and Notation of the Variables

	Variables	Measure	Notation
Dependent Variable	Net Interest Margin	Net Interest Income / Total Assets	NIM
Bank Specific Independent Variables	Overhead Cost	Overhead / Total Assets	OVERHEAD
	Capital Adequacy	Equity Capital / Total Asset	CA
	Asset Quality	Banks' Loans / Total Asset	AQ
	Non-Interest Bearing Asset	Non-interest bearing asset / Total Assets	NIBA
Macro-economic Independent Variables	GDP Growth	Annual Real GDP Growth Rate	GDP
	Inflation	Annual Inflation Rate	INF
	Real Interest Rate	Real Interest Rate	RIR
Financial Structure Independent Variable	Bank Concentration	Bank Assets of the largest Commercial Banks	CONC

3.5 Econometric Model

To examine the determinants of NIM, the following baseline model was estimated:

$$NIM_{it} = \alpha + \beta_1 \text{OVERHEAD}_{it} + \beta_2 CA_{it} + \beta_3 AQ_{it} + \beta_4 NIBA_{it} + \beta_5 GDP_t + \beta_6 INF_t + \beta_7 RIR_t + \beta_8 CONC_{it} + u_{it}$$

3.6 Justification of Estimation Technique

Although the dataset is a balanced panel, the study employs pooled Ordinary Least Squares (OLS). This choice is justified by:

i. Small cross-section (N = 15), where Fixed Effects (FE) may absorb most variation.
ii. Macroeconomic variables (GDP, INF, RIR) remain constant across banks each year; FE would drop them.
iii. Random Effects (RE) assumptions are likely violated because bank characteristics (governance, risk appetite) correlate with regressors.
iv. Balanced panel structure provides stable pooled OLS estimates.
v. Similar empirical studies in South Asian banking literature use pooled OLS under comparable data conditions.

3.7 Preliminary Diagnostic Tests

3.7.1 Descriptive Statistics

Descriptive statistics were examined to summarize the central tendency, dispersion, and distributional characteristics of all study variables. The mean, standard deviation,

minimum, and maximum values indicate reasonable variation across banks and over time. No extreme or implausible values were observed, suggesting that the data are suitable for subsequent econometric analysis.

3.7.2 Correlation Analysis

Pairwise correlation analysis was conducted to examine the linear relationships among the explanatory variables. The correlation coefficients indicate moderate associations between selected variables; however, no excessively high correlations were observed. This suggests that the risk of serious multicollinearity arising from strong pairwise relationships is limited.

3.7.3 Multicollinearity Diagnostics

To formally assess multicollinearity among the independent variables, Variance Inflation Factor (VIF) and Tolerance statistics were computed. Table 2 presents the results of the multicollinearity diagnostics.

Table 2: Multicollinearity Diagnostics (VIF and Tolerance)

Variable	Tolerance	VIF
Overhead	.791	1.264
CA	.676	1.480
AQ	.364	2.751
NIBA	.491	2.037
CONC	.395	2.532
GDP	.455	2.200
INF	.858	1.165
RIR	.450	2.224

The Variance Inflation Factor (VIF) values are well below the conventional threshold of 10, and tolerance values exceed the minimum acceptable level of 0.10, indicating that multicollinearity is not a concern in the estimated regression models.

3.7.4 Model Diagnostics and Econometric Considerations

To ensure the reliability of the estimated regression models, several diagnostic tests were conducted. Normality of regression residuals was assessed using the Shapiro–Wilk test. The results ($W = 0.699$, $p < 0.001$) indicate deviations from perfect normality; however, given the financial nature of the data and the moderate sample size, the residual distribution is considered acceptable for pooled OLS inference.

Autocorrelation was examined using the Durbin–Watson statistic ($DW = 0.779$), suggesting some positive serial correlation, which is common in bank-level panel data; therefore, results are interpreted with appropriate caution.

Heteroskedasticity was evaluated through visual inspection of standardized residuals plotted against standardized predicted values. The residuals exhibit no clear systematic pattern, suggesting the absence of severe heteroskedasticity.

Although the dataset is panel in nature, advanced panel-specific diagnostics such as the Hausman test for fixed versus random effects and formal endogeneity tests could not be implemented due to software limitations of SPSS. This limitation has been acknowledged, and pooled OLS estimates are reported in line with prior empirical banking studies conducted in data-constrained environments.

3.7.5 Sub-sample Analysis

To capture ownership effects, separate pooled OLS models were estimated for:

- Private Commercial Banks (N = 12)
- Public Commercial Banks (N = 3)

This allows comparison of how determinants influence NIM across ownership structures.

4. Data Analysis & Findings

4.1 Descriptive statistics

4.1.1 Descriptive statistics for All Banks

Table 3 presents the mean, standard deviation, minimum, and maximum values for all selected variables across 15 Bangladeshi commercial banks during 2009–2018. The average net interest margin (NIM) is 2.32 %, with a standard deviation of 1.65 %, indicating notable variation across banks. During the observation period, most institutions reported positive NIM, though a few showed negative results. For the explanatory variables, the mean and standard deviation of Overhead (salary expenses to total assets) are 1.26 % and 0.31 %. Capital Adequacy (CA) averages 8.01 % with a standard deviation of 2.13 %, while Asset Quality (AQ) shows an average of 60.22 % and a deviation of 10.16 %. The Non-Interest-Bearing Asset (NIBA) ratio averages 18.15 %, ranging from 9.32 % to 37.87 %. Bank Concentration (CONC) has a mean of 13.87 % and varies between 4.26 % and 51.98 %. For the macroeconomic indicators, average values of GDP growth, inflation (INF), and real interest rate (RIR) are 6.45 %, 6.87 %, and 5 %, respectively. The standard deviation of the real interest rate is 1.18 % across the study period.

Table 3: Descriptive Statistics for Variables (All Banks)

	Minimum	Maximum	Mean	Std. Deviation
NIM	-.0138	.1029	.023236	.0164993
OVERHEAD	.0001	.0197	.012601	.0031099
CA	.0180	.1543	.080050	.0212861
AQ	.3141	.7596	.602161	.1015849
NIBA	.0932	.3787	.181467	.0556094
CONC	.0426	.5198	.138707	.1094995
GDP	5.05	7.86	6.4470	.0079052
INF	5.42	11.40	6.8650	.0175291
RIR	3.07	6.89	5.0040	.0117843

Source: Own calculation based on 15 Banks.

4.1.2 Descriptive statistics for Private Commercial banks

Table 4 presents the mean, standard deviation, minimum, and maximum values of the selected variables for twelve (12) Bangladeshi private commercial banks during 2009–2018. The average net interest margin (NIM) is 2.78 %, with a standard deviation of 1.43 %, indicating considerable variation among the banks. Throughout the study period, most institutions reported positive NIM, though a few recorded negative values. For the explanatory variables, the mean and standard deviation of Overhead (salary expenses relative to total assets) are 1.26 % and 0.33 %. Capital Adequacy (CA) averages 8.49 % with a standard deviation of 1.99 %, while Asset Quality (AQ) shows an average of 63.68 % and a deviation of 7.19 %. The Non-Interest-Bearing Asset (NIBA) ratio averages 16.98 %, ranging from 9.32 % to 31.73 %. Bank Concentration (CONC) has a mean of 9.01 % and varies between 4.26 % and 14.48 %. For the macroeconomic indicators, the average values of GDP growth, inflation (INF), and real interest rate (RIR) are 6.45 %, 6.87 %, and 5 %, respectively. The standard deviation of the real interest rate is 1.18 % over the observed period.

Table 4: Descriptive Statistics for Variables (Private Commercial Banks)

	Minimum	Maximum	Mean	Std. Deviation
NIM	.0050	.1029	.027830	.0142567
OVERHEAD	.0001	.0197	.012648	.0033291
CA	.0506	.1543	.084894	.0199335
AQ	.3782	.7596	.636791	.0718756
NIBA	.0932	.3173	.169771	.0484483
CONC	.0426	.1448	.090052	.0232101
GDP	.0505	.0786	.064470	.0079119
INF	.0542	.1140	.068650	.0175438
RIR	.0307	.0689	.050040	.0117942

Source: Own calculation based on 12 Banks.

4.1.3 Descriptive statistics for Public Limited Commercial banks

Table 5 summarizes the mean, standard deviation, minimum, and maximum values for the selected variables of three (03) Bangladeshi public limited commercial banks during 2009–2018. The average net interest margin (NIM) is 0.49 %, with a standard deviation of 1.13 %, showing notable variability among these banks. Throughout the study period, most banks reported positive NIM, although some observations were negative. For the explanatory variables, the mean and standard deviation of Overhead (salary expense relative to total assets) are 1.24 % and 0.20 %. Capital Adequacy (CA) averages 6.07 % with a standard deviation of 1.46 %, while Asset Quality (AQ) has an average of 46.36 % and a deviation of 8.37 %. The Non-Interest-Bearing Asset (NIBA) ratio averages 22.83 %, ranging from 16.30 % to 37.87 %. Bank Concentration (CONC) has a mean of 33.33 %, with values spanning 22.20 % to 51.98 %. For the macroeconomic indicators, the average values of GDP growth, inflation (INF), and real interest rate (RIR) are 6.45 %, 6.87 %, and 5 %, respectively. The standard deviation of the real interest rate is 1.19 % over the study period.

Table 5: Descriptive Statistics for Variables (Public Limited Commercial Banks)

	Minimum	Maximum	Mean	Std. Deviation
NIM	-.0138	.0300	.004860	.0113134
OVERHEAD	.0092	.0170	.012410	.0020415
CA	.0180	.0807	.060673	.0145602
AQ	.3141	.5989	.463640	.0837254
NIBA	.1630	.3787	.228250	.0585370
CONC	.2020	.5198	.333327	.1020545
GDP	.0505	.0786	.064470	.0080135
INF	.0542	.1140	.068650	.0177692
RIR	.0307	.0689	.050040	.0119458

Source: Own calculation based on 3 Banks.

4.2 Panel Data Analysis: Key Empirical Outcomes

4.2.1 Empirical Results from Panel Data Analysis for All banks

Tables 6 presents the estimated parameters and t-statistics obtained from the panel data model where Net Interest Margin (NIM) is used as the dependent variable. The results show that Overhead, Asset Quality (AQ), and Non-Interest-Bearing Assets (NIBA) are highly significant and positively related to NIM at the 1% level of significance. Inflation is also significant and positively associated with NIM at the 5% level. In contrast, Bank Concentration (CONC) exhibits a negative and statistically significant impact on NIM at the 1% level.

Table 6: Determinants of Net Interest Margin (NIM): All Banks

	Coefficients	*Std. Error*	*t-ratio*	*p-value*	*Comment*
(Constant)	-.022	.024	-.896	.372	
OVERHEAD	1.047	.361	2.900	.004	*
CA	.013	.057	.229	.819	
AQ	.044	.016	2.722	.007	*
NIBA	.108	.026	4.200	.000	*
CONC	-.079	.015	-5.413	.000	*
GDP	-.184	.187	-.984	.327	
INF	.156	.061	2.542	.012	**
RIR	-.068	.126	-.536	.593	

Source: Own calculation based on 15 Banks.

Note: *, ** and *** respectively show significance level of 1%, 5% and 10%.

4.2.2 Empirical Results from Panel Data Analysis for Private Commercial Banks

Tables 7 present the estimated coefficients and corresponding t-statistics from the model, where Net Interest Margin (NIM) serves as the dependent variable. The results show that Non-Interest-Bearing Assets (NIBA) have a strong and statistically significant positive effect on NIM at the 1% significance level. In addition,

Overhead, Bank Concentration (CONC), and Inflation (INF) are positively associated with NIM and are significant at the 5% level. Conversely, GDP growth demonstrates a negative and statistically significant relationship with NIM at the 5% level.

Table 7: Determinants of Net Interest Margin (NIM): Private Commercial Banks

	Coefficients	***Std. Error***	***t-ratio***	***p-value***	***Comment***
(Constant)	.009	.028	.324	.746	
OVERHEAD	.956	.399	2.394	.018	**
CA	-.036	.067	-.534	.594	
AQ	.014	.020	.687	.494	
NIBA	.095	.031	3.077	.003	*
CONC	.122	.054	2.255	.026	**
GDP	-.457	.224	-2.040	.044	**
INF	.173	.071	2.441	.016	**
RIR	-.166	.145	-1.146	.254	

Source: Own calculation based on 12 Banks.

Note: *, ** and *** respectively show significance level of 1%, 5% and 10%.

4.2.3 Empirical Results from Panel Data Analysis for Public Limited Commercial Banks

Tables 8 presents the estimated coefficients and corresponding t-statistics from the model in which Net Interest Margin (NIM) is treated as the dependent variable. The findings show that Asset Quality (AQ) and Inflation (INF) have a strong, statistically significant positive effect on NIM at the 1 % significance level. Additionally, Non-Interest Bearing Assets (NIBA) exhibit a positive and statistically significant impact on NIM at the 5 % level.

Table 8: Determinants of Net Interest Margin (NIM): Public Limited Commercial Banks

	Coefficients	***Std. Error***	***t-ratio***	***p-value***	***Comment***
(Constant)	-.038	.044	-.878	.390	
OVERHEAD	.595	1.142	.521	.608	
CA	-.065	.072	-.900	.378	
AQ	.083	.018	4.693	.000	*
NIBA	.063	.036	1.750	.095	***
CONC	-.039	.027	-1.465	.158	
GDP	-.219	.277	-.792	.437	
INF	.258	.058	4.421	.000	*
RIR	-.068	.195	-.347	.732	

Source: Own calculation based on 3 Banks.

Note: *, ** and *** respectively show significance level of 1%, 5% and 10%.

4.4 Independent one sample t-test analysis

Dependent Variable Comparison Analysis between Private and Public Limited Commercial Banks: Table shows group statistics and independent t-test between Private and Public Limited Commercial Banks. In the group statistics variable, it is found that the means of NIM of Private Commercial Banks are greater than Public Limited Commercial Banks.

Table 9: Independent T-test between Private and Public Limited Commercial Banks

Group Statistics					
	Categories of banks	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Net Interest Margin	Private Commercial Banks	120	.027830	.0142567	.0013015
	Public Limited Commercial Banks	30	.004860	.0113134	.0020655

Source: Own calculation based on 15 Banks.

The independent t-test results indicate that the significance level for NIM is *0.762* when equal variances are assumed. The calculated *p-value* for NIM is *0.000*, which is below the 0.05 threshold, so the null hypothesis is rejected. This means that net interest margins differ significantly between private and public limited commercial banks.

Table 10: Results of the independent *t*-test comparing private and public limited commercial banks

		Levene's Test for Equality of Variances					
		F	**Sig.**	**t**	**df**	**P-value**	**Mean Difference**
NIM	Equal variances assumed	.092	.762	8.196	148	.000	.0229700
	Equal variances not assumed			9.409	54.503	.000	.0229700

Source: Own calculation based on 15 Banks.

4.5 Findings

The empirical analysis of data from the selected private and public commercial banks in Bangladesh reveals that overhead expenses, asset quality (AQ), and non-interest-bearing assets (NIBA) exert a positive and statistically significant influence on the net interest margin (NIM). In contrast, bank concentration (CONC) demonstrates a negative and significant association with NIM, indicating that greater market dominance reduces interest margins. Among the macroeconomic indicators, inflation (INF) shows a positive and significant effect on NIM, whereas GDP growth exhibits a negative impact, suggesting that periods of stronger economic expansion may lead to reduced margins for banks.

Further disaggregation by ownership structure shows notable differences. For private commercial banks, overhead costs, NIBA, CONC, and inflation positively influence NIM, while GDP growth has a negative effect. Asset quality (AQ) shows a positive association with NIM in private banks, although the effect is not statistically significant.. For publicly listed commercial banks, AQ, INF, and NIBA are positively associated with NIM, whereas GDP growth and the real interest rate (RIR) exert negative influences. These findings highlight that both bank-specific and macroeconomic factors shape interest margin performance, though the degree and direction of their effects differ between private and public banks.

Overall, the results suggest that internal managerial and balance-sheet characteristics are more influential in determining interest margins than macroeconomic factors, underscoring the importance of bank-level efficiency and asset quality management in Bangladesh's banking sector.

5. Conclusion

Interest income remains the primary revenue source for commercial banks, making the net interest margin (NIM) a critical indicator of profitability, financial stability, and sectoral performance. Based on the empirical analysis of private and public commercial banks in Bangladesh, this study finds that overhead costs, asset quality (AQ), and non-interest-bearing assets (NIBA) exert a positive and statistically significant effect on NIM. In contrast, bank concentration (CONC) shows a negative and significant association with NIM, indicating that higher market dominance reduces banks' interest margins. Among the macroeconomic indicators, inflation (INF) positively affects NIM, while GDP growth has a negative impact, suggesting that periods of stronger economic expansion may compress bank margins.

The empirical findings indicate that bank-specific factors play a dominant role in explaining variations in net interest margins in Bangladesh. In particular, overhead costs, asset quality, and non-interest-bearing assets exert a positive and statistically significant impact on NIM, while higher market concentration is associated with lower margins. Among macroeconomic variables, inflation contributes positively to interest margins, whereas GDP growth shows a negative relationship. Sub-sample analysis further reveals that the magnitude and significance of these effects differ between private and public commercial banks, highlighting structural and operational differences across ownership types.

The findings also reveal important differences across bank ownership types. For private commercial banks, overhead costs, NIBA, CONC, inflation, and asset quality contribute positively to NIM, whereas GDP growth exerts a negative influence. For publicly listed commercial banks, asset quality, inflation, and NIBA enhance NIM, while GDP growth and the real interest rate (RIR) reduce it. These results highlight that both bank-specific characteristics and macroeconomic conditions significantly influence interest margin behavior in Bangladesh, although the magnitude and direction of their effects vary between private and public institutions.

Overall, the study emphasizes the importance of improving operational efficiency, strengthening asset quality, and maintaining an optimal balance of interest-bearing and non-interest-bearing assets to enhance NIM. Policymakers and regulators should

also monitor market concentration and macroeconomic conditions, as these factors play a substantial role in shaping the profitability and financial performance of Bangladesh's commercial banking sector. Given the presence of some degree of serial correlation and deviations from perfect normality, the estimated coefficients are interpreted as associative rather than strictly causal.

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Appendices

Table-1: Group Statistics of Private and Public Limited Commercial Banks

Group Statistics					
	Categories of banks	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Net Interest Margin	Private Commercial Banks	120	.027830	.0142567	.0013015
	Public Limited Commercial Banks	30	.004860	.0113134	.0020655
Overhead	Private Commercial Banks	120	.012648	.0033291	.0003039
	Public Limited Commercial Banks	30	.012410	.0020415	.0003727
Capital Adequacy	Private Commercial Banks	120	.084894	.0199335	.0018197
	Public Limited Commercial Banks	30	.060673	.0145602	.0026583
Asset Quality	Private Commercial Banks	120	.636791	.0718756	.0065613
	Public Limited Commercial Banks	30	.463640	.0837254	.0152861
Non-interest Bearing Asset	Private Commercial Banks	120	.169771	.0484483	.0044227
	Public Limited Commercial Banks	30	.228250	.0585370	.0106874
Bank Concentration	Private Commercial Banks	120	.090052	.0232101	.0021188
	Public Limited Commercial Banks	30	.333327	.1020545	.0186325
GDP Growth Rate	Private Commercial Banks	120	.064470	.0079119	.0007223
	Public Limited Commercial Banks	30	.064470	.0080135	.0014631
Inflation	Private Commercial Banks	120	.068650	.0175438	.0016015
	Public Limited Commercial Banks	30	.068650	.0177692	.0032442
Real Interest Rate	Private Commercial Banks	120	.050040	.0117942	.0010767
	Public Limited Commercial Banks	30	.050040	.0119458	.0021810

Table-2 Independent Samples t-test of Private and Public Limited Commercial Banks

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Net Interest Margin	Equal variances assumed	.092	.762	8.196	148	.000	.0229700	.0028026	.0174318	.0285082
	Equal variances not assumed			9.409	54.503	.000	.0229700	.0024414	.0180764	.0278636
Overhead	Equal variances assumed	7.903	.006	.374	148	.709	.0002383	.0006366	-.0010198	.0014964
	Equal variances not assumed			.496	72.559	.622	.0002383	.0004809	-.0007202	.0011969
Capital Adequacy	Equal variances assumed	3.844	.052	6.245	148	.000	.0242208	.0038785	.0165564	.0318852
	Equal variances not assumed			7.519	59.367	.000	.0242208	.0032215	.0177755	.0306662
Asset Quality	Equal variances assumed	3.002	.085	11.410	148	.000	.1731508	.0151759	.1431614	.2031403
	Equal variances not assumed			10.409	40.337	.000	.1731508	.0166348	.1395395	.2067622
Non-interest Bearing Asset	Equal variances assumed	5.332	.022	-5.664	148	.000	-.0584792	.0103254	-.0788834	-.0380749
	Equal variances not assumed			-5.056	39.501	.000	-.0584792	.0115663	-.0818648	-.0350936
Bank Concentration	Equal variances assumed	220.851	.000	-23.961	148	.000	-.2432750	.0101529	-.2633384	-.2232116
	Equal variances not assumed			-12.973	29.754	.000	-.2432750	.0187526	-.2815862	-.2049638
GDP Growth Rate	Equal variances assumed	.000	1.000	.000	148	1.000	.0000000	.0016191	-.0031995	.0031995
	Equal variances not assumed			.000	44.217	1.000	.0000000	.0016316	-.0032879	.0032879
Inflation	Equal variances assumed	.000	1.000	.000	148	1.000	.0000000	.0035902	-.0070946	.0070946
	Equal variances not assumed			.000	44.217	1.000	.0000000	.0036180	-.0072905	.0072905
Real Interest Rate	Equal variances assumed	.000	1.000	.000	148	1.000	.0000000	.0024136	-.0047695	.0047695
	Equal variances not assumed			.000	44.217	1.000	.0000000	.0024323	-.0049012	.0049012

Table-3: Frequency Distribution: All Banks

Statistics										
		Net Interest Margin	Overhead	Capital Adequacy	Asset Quality	Non-interest Bearing Asset	Bank Concentration	GDP Growth Rate	Inflation	Real Interest Rate
N	**Valid**	150	150	150	150	150	150	150	150	150
	Missing	0	0	0	0	0	0	0	0	0
Mean		.023236	.012601	.080050	.602161	.181467	.138707	.064470	.068650	.050040
Median		.023100	.012450	.077000	.632500	.171700	.098650	.064900	.062100	.052000
Mode		.0195	.0114[a]	.0626	.6301[a]	.1130[a]	.1030	.0505[a]	.0542[a]	.0307[a]
Std. Deviation		.0164993	.0031099	.0212861	.1015849	.0556094	.1094995	.0079052	.0175291	.0117843
Variance		.000	.000	.000	.010	.003	.012	.000	.000	.000
Skewness		1.228	-.501	.664	-1.023	.907	2.024	.031	1.622	-.202

Std. Error of Skewness	.198	.198	.198	.198	.198	.198	.198	.198	.198
Kurtosis	5.402	2.086	1.468	.425	.531	3.320	-.614	1.809	-1.047
Std. Error of Kurtosis	.394	.394	.394	.394	.394	.394	.394	.394	.394
Range	.1167	.0196	.1363	.4455	.2855	.4772	.0281	.0598	.0382
a. Multiple modes exist. The smallest value is shown									

Table-4: Frequency Distribution: Private Limited Banks

Statistics										
		Net Interest Margin	**Overhead**	**Capital Adequacy**	**Asset Quality**	**Non-interest Bearing Asset**	**Bank Concentration**	**GDP Growth Rate**	**Inflation**	**Real Interest Rate**
N	**Valid**	120	120	120	120	120	120	120	120	120
	Missing	0	0	0	0	0	0	0	0	0
Mean		.027830	.012648	.084894	.636791	.169771	.090052	.064470	.068650	.050040
Median		.025200	.012550	.082050	.647800	.161850	.088700	.064900	.062100	.052000
Mode		.0195	.0166	.0626[a]	.6301[a]	.1130[a]	.1030	.0505[a]	.0542[a]	.0307[a]
Std. Deviation		.0142567	.0033291	.0199335	.0718756	.0484483	.0232101	.0079119	.0175438	.0117942
Variance		.000	.000	.000	.005	.002	.001	.000	.000	.000
Skewness		2.495	-.569	.985	-1.366	.900	.065	.031	1.626	-.203
Std. Error of Skewness		.221	.221	.221	.221	.221	.221	.221	.221	.221
Kurtosis		9.703	1.826	1.264	2.837	.538	-.608	-.609	1.835	-1.046
Std. Error of Kurtosis		.438	.438	.438	.438	.438	.438	.438	.438	.438
Range		.0979	.0196	.1037	.3814	.2241	.1022	.0281	.0598	.0382
a. Multiple modes exist. The smallest value is shown										

Table-5: Frequency Distribution: Public Limited Commercial Banks

Statistics										
		Net Interest Margin	**Overhead**	**Capital Adequacy**	**Asset Quality**	**Non-interest Bearing Asset**	**Bank Concentration**	**GDP Growth Rate**	**Inflation**	**Real Interest Rate**
N	**Valid**	30	30	30	30	30	30	30	30	30
	Missing	0	0	0	0	0	0	0	0	0
Mean		.004860	.012410	.060673	.463640	.228250	.333327	.064470	.068650	.050040
Median		.003400	.012250	.062750	.464000	.199150	.299200	.064900	.062100	.052000
Mode		.0034	.0105	.0585	.3141[a]	.1630[a]	.4526	.0505[a]	.0542[a]	.0307[a]
Std. Deviation		.0113134	.0020415	.0145602	.0837254	.0585370	.1020545	.0080135	.0177692	.0119458
Variance		.000	.000	.000	.007	.003	.010	.000	.000	.000
Skewness		.275	.520	-1.159	-.185	.721	.567	.032	1.691	-.211
Std. Error of Skewness		.427	.427	.427	.427	.427	.427	.427	.427	.427
Kurtosis		-.209	-.210	1.884	-.902	-.410	-1.273	-.523	2.263	-1.021
Std. Error of Kurtosis		.833	.833	.833	.833	.833	.833	.833	.833	.833
Range		.0438	.0078	.0627	.2848	.2157	.3178	.0281	.0598	.0382
a. Multiple modes exist. The smallest value is shown										