

Bank Specific, Industry Specific and Macroeconomic Determinants of Commercial Bank Profitability: A Case of Bangladesh

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The study examines the bank-specific, industry-specific and macroeconomic determinants of 26 DSE listed bank's profitability in Bangladesh during 2008 to 2011. Bank profitability is calculated by return on assets (ROA) and Net interest Margin (NIM) as a function of bank-specific, industry-specific and macroeconomic determinants. The empirical results show that the profitability of the Bangladesh banking sector is determined by bank size, higher cost efficiency, capitalization, higher concentration, regardless of whether ROA or NIM is used as the dependent variable. Credit risk and ROA have a negative relation, whereas the relationship with NIM is positive. Inflation is significantly related to NIM but not with ROA, and labor productivity and nontraditional activity have a positive effect on ROA only.

1. Introduction

The banking sector of Bangladesh plays a significant role in the expansion of the financial system and the economy of the nation. According to Fama (1980) banks are in a business of deposits as liabilities and issuing debt securities in one part and invest in assets on the other part. The majority of fund transfers relative to gross domestic product (GDP) are conducted by banks. Banks play the leading role in the economic growth process of Bangladesh. Beck and Rahman (2006) support this argument by affirming that other structures of the financial mechanism in Bangladesh are notably less developed relative to the banking system.

Uddin and Suzuki (2011) affirm that financial restructuring has brought notable changes in the structure of the banking industry. The factors influencing the profitability of banking sector are also important in solving the problems of the banking industry. Most of the reforms of financial structure initiated by the government have concentrated mostly on the banking sector. Consequently many changes relating to ownership, market concentration, regulatory measures and policies have taken place to improve banking performance.

According to Leeladhar (2005) the banking sector of Bangladesh has undergone noteworthy growth in size and complexity in recent years. In spite of making improvements in the areas of financial feasibility, profitability, modernism and competitiveness, concerns remain that banks have been unable to take into account vast segments of the population, especially the underprivileged rural people into the coverage of basic banking services.

This article examines the factors influencing the profitability of the Bangladesh banking sector over the period 2008-2011. Although several studies (Antonina 2010; Abbasoğlu,

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Aysan & Güneş 2007; Ali, Akhtar & Ahmed 2011; Sufian 2011; Ramlall 2009) examined the profitability of banks in developed countries, empirical works on bank specific, industry-specific and macroeconomic factors affecting the profitability of banks in developing countries such as Bangladesh are relatively rare. This paper seeks to address this void by conducting an empirical investigation in the context of Bangladesh, which according to the researchers can be the basis of long-term macroeconomic policy for the country.

This study explores three different groups of determinants affecting banking profitability in Bangladesh, namely the bank-specific, industry specific and macroeconomic variables. The first group includes bank size, credit risk, and loan to total asset, taxation, capitalization, cost efficiency, non-traditional activity and labor productivity. The second group includes concentration ratio and banking sector development. The third group connects profitability to the macroeconomic surroundings within which the banking systems work.

The paper is divided into seven sections. Section 2 reviews the existing literature on the determinants of bank profitability. Section 3 reviews the market and data description. Section 4 outlines the empirical methodology. Section 5 presents the main results and Section 6 summarizes relationship between Bank specific determinants and Profitability and Section 7 states the conclusion of the study.

2. Literature Review

2.1 Studies on Asian Banking Industry

Javaid, Anwar, Zaman and Gafoor (2011) analyzed the determinants of top 10 banks' profitability in Pakistan over the period 2004-2008. Their results demonstrated that higher total assets possibly will not lead to higher profits due to diseconomies of scales. Ali, Akhtar and Ahmed (2011) examined the profitability pointers of public and private commercial banks of Pakistan in 2006-2009 using return on assets (ROA) and return on equity (ROE) as profitability measures to verify the influence of bank-specific and macroeconomic indicators on profitability. Well-organized asset management and economic expansion create positive and important relation with profitability in both cases measured by ROA and ROE. Operating efficiency has a tendency to demonstrate higher profitability level as measured by ROE and high credit risk and capitalization leads to lower profitability as measured by ROA.

Bukhaari and Quodous (2012) studied the relationship between the factors that affect the profitability of a bank using data of five years from 2005 to 2009 taken on quarterly basis for 11 banks in Pakistan. The result indicates that a small amount of internal variables have considerable persuasion on a bank's profitability whereas external variables do not influence profitability of the banks. Tan and Floros (2012) inspect the effects of inflation on bank profitability. Empirical results show that there is a positive relationship between bank profitability, banking sector development, cost efficiency, stock market development and inflation in China. Khrawish (2011) scrutinized Jordanian commercial banks and determined that there is significantly positive relationship between ROA and tBank size, Total Equity/ Total Assets, Total Liabilities / Total Assets, Net Interest Margin (NIM) and Exchange Rate (ERS) of the commercial banks and there are noteworthy negative relationships between ROA and Annual Growth Rate for Gross domestic product (GDPGR), and Inflation Rate (INF) of the commercial banks.

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Sufian (2011) investigated the profitability of banks in Korea using a wide range of bank specific and macroeconomic determinants. The study found that banks with lower Loan to Total Asset levels have a propensity to display higher profitability and higher diversification shows a positive effect. Syafri (2012) studied sample data from commercial banks listed on the Indonesia Stock Exchange between 2002 and 2011. His results showed that total equity to total assets, loan to total assets, loan loss provision to total loan have affirmative effect on profitability, while on the other hand inflation rate, bank size and cost-to-income ratio have a negative effect on profitability. Ramlall (2009) showed that credit risk generates a negative impact on profitability. Vong and Chan (2007) examined bank internal determinants, macroeconomic and financial structure variables on the performance of the Macao banking industry. They concluded that a well-capitalized bank will be at a lower risk which will translate into higher profitability and the rate of inflation is shown to have a significant impact on bank performance. Wallich (1980) reported inflation to be good for banks, since reported assets rose faster during inflation than during ordinary times according to the study.

2.2 Studies on Bangladesh Banking System

Podder (2012) examined the growth of private commercial banks in Bangladesh and posited that PCBs need to focus on profitability determinants. Chowdhury and Ahmed (2009) measured the performance of 5 private commercial banks of Bangladesh during 2002-2006 using a number of variables including number of employees and branches, income after tax, amount of deposits accumulated and loans disbursed, and earnings per share and found stable expansion in these banks during the sample period. Sayeed, Edirisuriya and Hoque (2012) examined the impact of asset and liability management on the profitability of commercial banks in Bangladesh and found that assets management of large commercial banks is superior to those of small banks, but they are not any better than small banks in terms of liability management. Mujeri and Younus (2009) studied the interest rate spread (IRS) in the banking sector of Bangladesh from the data of 48 banks during 2004 to 2008 using a bank profit maximization model based on the empirical industrial organization approach. The analysis showed that the ratio of non-interest income to total assets of a bank and its spread has a negative effect on profitability

As stated previously, empirical studies which examine the profitability affecting factors of commercial banks in the context of developing countries are relatively scarce in comparison to the developed nations, and it is this area which the present study attempts to address by examining relevant factors in the banking industry of Bangladesh. This study will be the first to examine the banking sector of the country through a wide set of indicators within the larger macroeconomic framework.

3. Market and Data Description

The study selected banking data composed of annual figures from 26 Bangladeshi banks over the period 2008-2011 from a sample of 30 banks listed in Dhaka Stock Exchange (DSE). Bank-specific information and industry-specific information are taken from the financial statements published on the respective websites. The industry-specific and macroeconomic variables have been retrieved from the website of Bangladesh Bank and World Bank database. The list of the variables used is presented in Table 1 including the notations. A summary of the predictable effects of the determinants, in accordance with the theory and previous literature are also included.

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Table 1: List of determinants of profitability

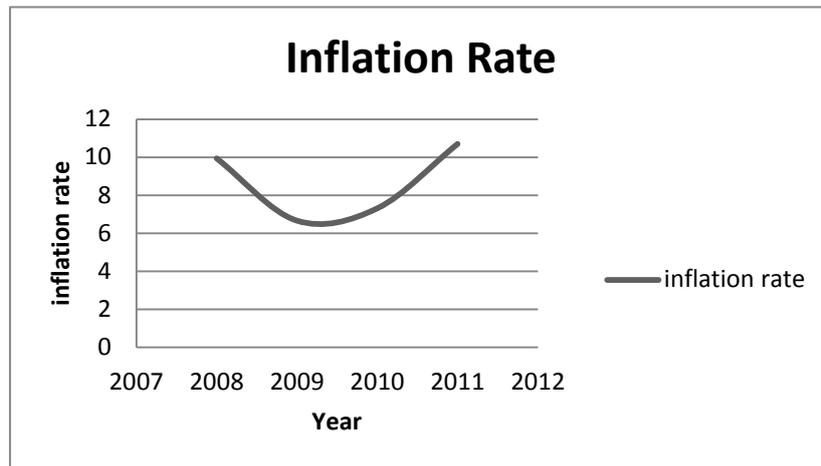
ROA		$\frac{\text{Net income}}{\text{Total Assets}}$		Profitability	Financial statement of banks
NIM		$\frac{\text{Net interest income}}{\text{Earning Assets}}$		Profitability	Financial statement of banks
Bank size	LTA	Log of total assets	?	Bank specific	– Financial statement of banks
Credit Risk	CR	$\frac{\text{Loan loss provision}}{\text{Total loans}}$	-	Bank specific	– Financial statement of banks
Loan to Total Asset	LQ	$\frac{\text{Total loan}}{\text{Total assets}}$?	Bank specific	– Financial statement of banks
Taxation	TX	$\frac{\text{Tax}}{\text{Operating profit before tax}}$	+	Bank specific	– Financial statement of banks
Capitalization	CAP	$\frac{\text{Shareholder's equity}}{\text{Total assets}}$?	Bank specific	– Financial statement of banks
Cost efficiency	CE	$\frac{\text{Operating expense}}{\text{Total assets}}$?	Bank specific	– Financial statement of banks
Non-traditional activity	NTA	$\frac{\text{Non-interest income}}{\text{Gross revenue}}$?	Bank specific	– Financial statement of banks
Labor productivity	LP	$\frac{\text{Gross revenue}}{\text{Number of employees}}$	+	Bank specific	– Financial statement of banks
Concentration	C(3) C(5)	$\frac{\text{Total assets of largest three banks or five banks}}{\text{Total assets of whole industry}}$?	Industry specific	– Financial statement of banks
Banking sector development	BSD	$\frac{\text{Banks assets}}{\text{GDP}}$	-	Industry specific	– Financial statement of banks and Bangladesh bank
Inflation	INF	Annual inflation rate	?	Macro economic	Bangladesh bank

Notes: (+) means positive effect ; (-) means negative effect; (?) means no indication.

Some of the variables used in this study are important for the progress of the banking industry and policy making by the Government. Labor productivity is an indication of the employment and administration skills of banks. Traditional activity is an indicator of the expansion of banking sector in service and diversification ability.

Inflation rate refers to a general climb up in price level calculated relative to a typical level of purchasing power. The most recognized measures of Inflation are the CPI and the GDP deflator. CPI measures consumer prices and GDP deflator measures inflation in the domestic economy. Figure 1 shows the inflation rate in Bangladesh during 2008-2011. In 2009, the inflation rate is 6.66 per cent, the lowest point during the observation period while it achieves the highest point in 2011, i.e. 10.7 per cent according to figures from the Bangladesh Bureau of Statistics.

Figure 1: Inflation Rate of Bangladesh



4. Research Methodology

To investigate the determinants of commercial bank profitability, the study selects thirteen variables, two of them dependent and the others are explanatory variables. The independent variables are divided into three sub-categories such as bank-specific, industry specific and macroeconomic determinants of bank profitability.

4.1 Dependent Variables: Performance Measures (ROA and NIM)

ROA and NIM are used for the performance determination of the banks of Bangladesh. ROA is used to evaluate the competence and operational performance of banks as it examines the profits generated from the assets invested by the bank. Using ROA as dependent variable, the study provides a scope for comparing the results to other findings reported in the literature. NIM measures the spread between interest revenues and interest costs and how management has been able to control the cost over the bank's earning assets and detection of the cheapest sources of funding.

4.2 Bank-Specific Variables

The bank-specific variables included in this analysis are LTA (log of total assets), CR (loan loss provisions/total loans), LQ (loans/assets), TX (tax/operating profit before tax), CAP (shareholder's equity/total assets), CE (overhead expenses/total assets), NTA (non-interest income/total assets) and LP (total revenue/number of employees).

Capitalization (CAP) has been stated to be the principal factor in explaining the performance of financial institutions. A lower capital ratio signifies a comparatively risky position. Kosmidou, Tanna and Pasiouras (2002) and Ramlall (2009) state that capital strength of banks has a positive influence on profitability. Ali, Akhtar and Ahmed (2011)

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find capitalization leads to lower profitability measured by return on assets (ROA). Higher capitalization should promote profitability. Tan and Floros (2012) and Eichengreen and Gibson (2001) suggest that the consequence of bank size on its profitability may be positive up to a certain boundary.

Changes in credit risk (CR) may initiate changes in the fitness of a bank's portfolio, which may influence the performance of the organization. Davydenko (2010), Ali, Akhtar and Ahmed (2011), Sufian (2011) and Ramlall (2009) found that provisions for loans are significant and have a strong negative effect on profitability. According to Kithinji (2010) the profits of commercial banks are not influenced by the amount of credit and nonperforming loans. Syafri (2012)'s results showed that loan loss provision to total loan has a positive effect on profitability.

Loan to Total Asset (LA), arising from the incapability of banks to accommodate decreases in liabilities or to fund increases on the assets' side of the balance sheet, is considered to be an important determinant of profitability. A larger share of loans to total asset should imply more interest revenue because of higher risk. Olweny and Shiphoh (2011), Alper and Anbar (2011), Khrawish (2011), Sufian (2011) and Syafri (2012) found that loan to total assets ratio has a positive effect on profitability.

Direct taxation (TAX) through corporate tax and other taxes are an important issue for banks. Tan and Floros (2012) posit that profitability can be explained by higher taxation. Gilbert and Wheelock (2007) also support this statement.

Bank size (LTA) is usually used to examine the economies or diseconomies of scale in the banking sector. A large bank reduces cost because of economies of scale and scope. Kosmidou, Tanna and Pasiouras (2002), Alper and Anbar (2011) and Khrawish (2011) found positive relationship between ROA and bank size. On the other hand, Syafri (2012) found that bank size has negative effect on profitability.

Reduced expenses (EC) pick up the efficiency, and raise the profitability of a financial institution. Turati (2003), Kosmidou, Tanna and Pasiouras (2002), Olweny and Shiphoh (2011), Tan and Floros (2012), Syafri (2012) and Sufian (2011) found that costs have a negative effect and cost efficiency has a positive effect on profitability.

When banks are more diversified, they produce more income resources, thereby reducing their reliance on interest income which can be easily affected by an unfavorable macroeconomic atmosphere. Alper and Anbar (2011), Olweny and Shiphoh (2011) and Sufian (2011) state that non-interest income has a significantly positive effect on bank profitability. On the other hand Tan and Floros (2012) reported that low profitability can be explained by a higher volume of non-traditional activity.

4.3 Industry-Specific Variables

Studies by Staikouras and Wood (2004) and Sufian (2011) indicate that industry concentration has a positive impact on banking performance. This improves profit margins of banks. However, there are also some studies that report a contradictory outcome. Demirgüç-Kunt and Huizinga (1997) report a negative relation between concentration and bank profitability. Abbasoğlu, Ahaysan and Güneş (2007) did not find the existence of a relationship between concentration and profitability.

A high bank asset-to GDP ratio indicates that financial development plays an important role in the economy. When the market becomes more competitive, banks need to adapt different strategies in order to retain profitability. Demirgüç-Kunt and Huizinga (1997) present evidence that financial expansion and structure are important variables. Their results show that banks in countries where bank assets comprise a large portion of GDP generally have smaller margins and less profitability.

4.4 Macroeconomic Variables

Inflation is an important determinant of banking performance. High inflation rates are related with high loan interest rates and incomes. The effect of inflation on banking performance depends on whether inflation is predicted or unexpected. If inflation is fully anticipated and interest rates are adjusted accordingly, a positive impact on profitability will result. On the other hand, unanticipated raises in inflation cause cash flow difficulties for borrowers which can lead to premature termination of loan planning and loan losses. The findings of the relationship between inflation and profitability are varied. Studies by Wallich (1980), Vong and Chan (2007) and Tan and Floros (2012) show that high inflation rates lead to higher bank profitability. The studies of Khrawish (2011) and Syafri (2012) report a negative relation between inflation and profitability. In addition, Demirguc-Kunt and Huizinga (1997) observe that banks in developing countries are likely to be less profitable in inflationary environments when they have a high capital ratio. Since there is a multicollinearity problem, this variable is excluded from this study.

The present study is an improvement over previous studies and models since it examines industry specific, bank specific and macroeconomic variables within the same model. Previous models and studies refrained from this approach and hence the study model includes a level of flexibility and applicability which can be tailored to any economic scenario through the inclusion or exclusion of relevant variables.

5. Empirical Results

The study investigated the determinants of bank profitability using annual data for 26 Bangladeshi banks during 2008-2011. ROA and NIM are used for the determination of bank performance in Bangladesh. There are two reasons for using ROA as a measurement of bank profitability. First, it shows the profit earned per unit of assets and reflects the management's ability to utilize the bank's financial and investment resources to generate profit (Hassan and Bashir, 2003). Furthermore, bank profitability is best measured by ROA because it is not distorted by higher equity multipliers. Figures 2, 3 and 4 show the trend of profit measurement variables, the trend of bank specific variable and the trend of industry specific variables of the selected banks in Bangladesh respectively.

Figure 2: Performance measures (ROA and NIM) variables trend of banks of Bangladesh

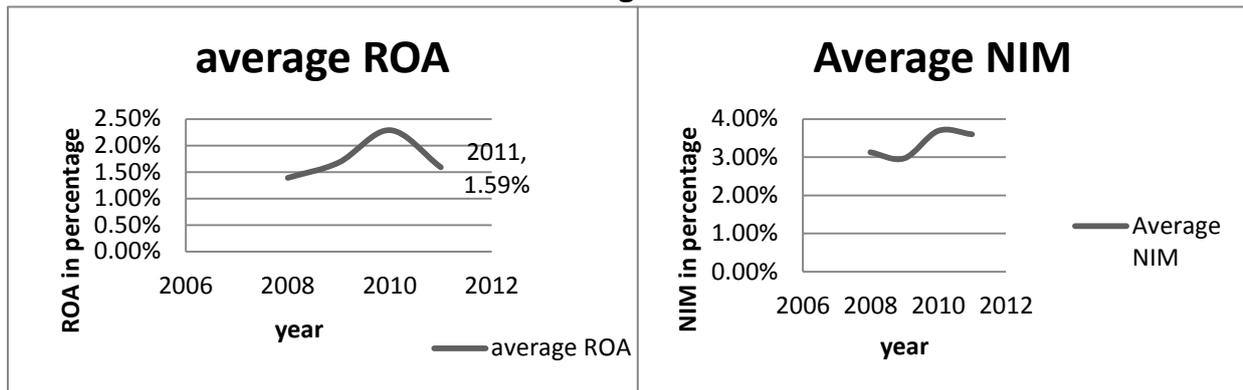


Table 2 shows the summary statistics of the variables used in the study. The results find that ROA is lower than NIM. There is a small difference in terms of cost efficiency credit risk and Loan to Total Asset compared with other bank-specific variables as seen from the minimum and maximum values. The maximum amount of non-traditional business conducted by the banks is found to be 80.90%, while the minimum amount is 23.56%. The maximum taxation is 60.74% while minimum taxation amount is 22.11%. The differences between the minimum and maximum values of banking sector development and concentration are smaller than inflation, which suggests that the banking variables are more stable than macroeconomics variables in Bangladesh.

Table 2: Summary of Descriptive Statistics of the Variable

ROA	1.74%	0.73%	0.33%	5.10%	4.77%
NIM	3.35%	1.35%	0.77%	11.64%	10.87%
Bank size (amount in ten billions)	9.37	5.65	2.98	38.93	35.95
Credit Risk	0.77%	0.57%	-0.94%	2.44%	3.38%
Loan to Total Asset	71.27%	5.50%	56.43%	83.75%	27.32%
Taxation	44.16%	7.55%	22.11%	60.74%	38.63%
Capitalization	8.59%	2.18%	5.00%	15.43%	10.43%
Cost efficiency	2.20%	0.79%	0.00%	4.68%	4.68%
Non-traditional activity	54.76%	11.64%	23.56%	80.90%	57.34%
Labor productivity (in millions)	3.33	1.53	1.14	8.00	6.86
Concentration (C3)	24.19%	1.23%	22.91%	26.06%	3.15%
Concentration (C5)	34.19%	1.29%	32.77%	36.05%	3.28%
Banking sector development	36.26%	4.42%	30.32%	42.07%	11.75%
Inflation	8.6525	1.712828	6.66	10.7	4.04

Figure 3: Trend of bank specific variables of Bangladeshi banks

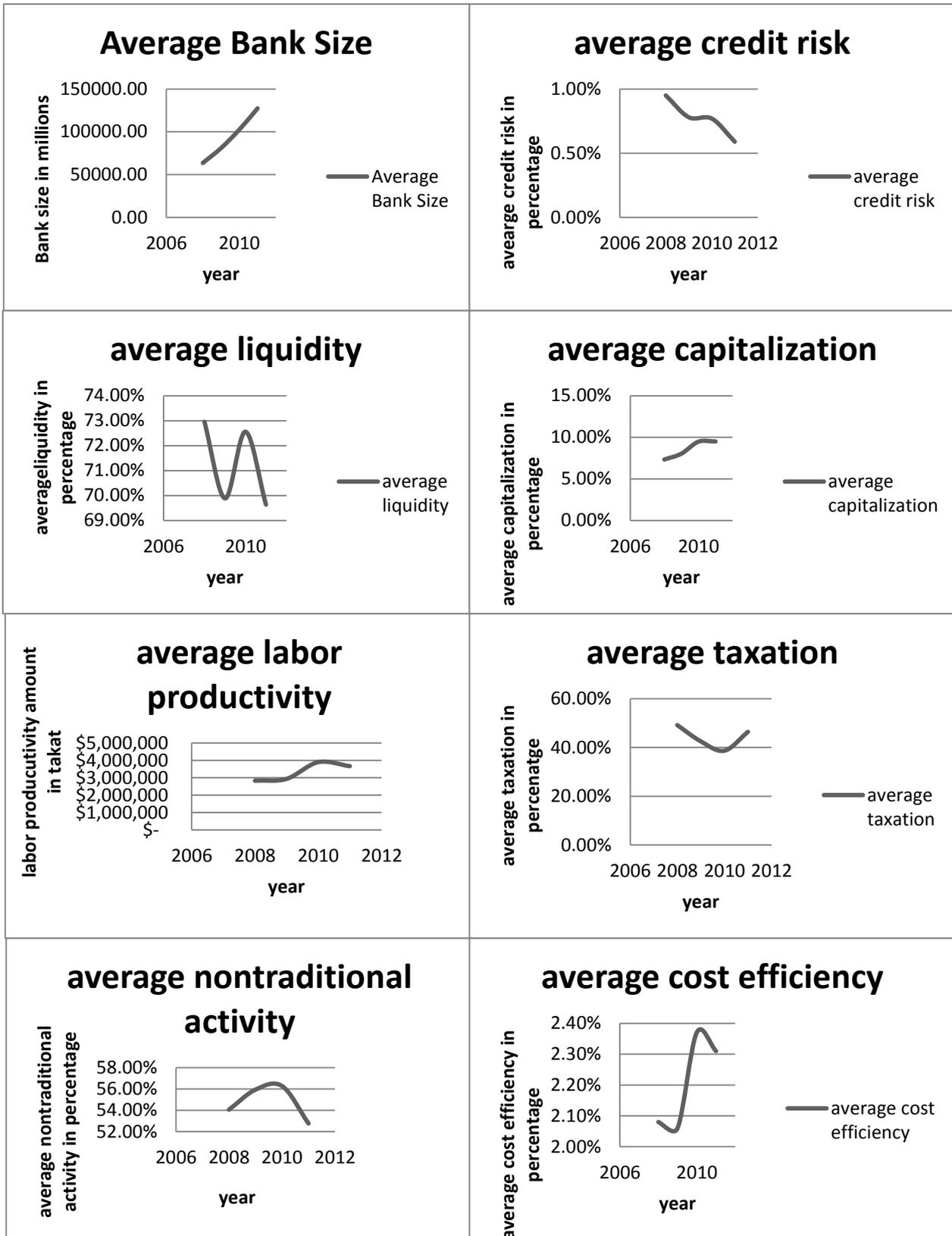
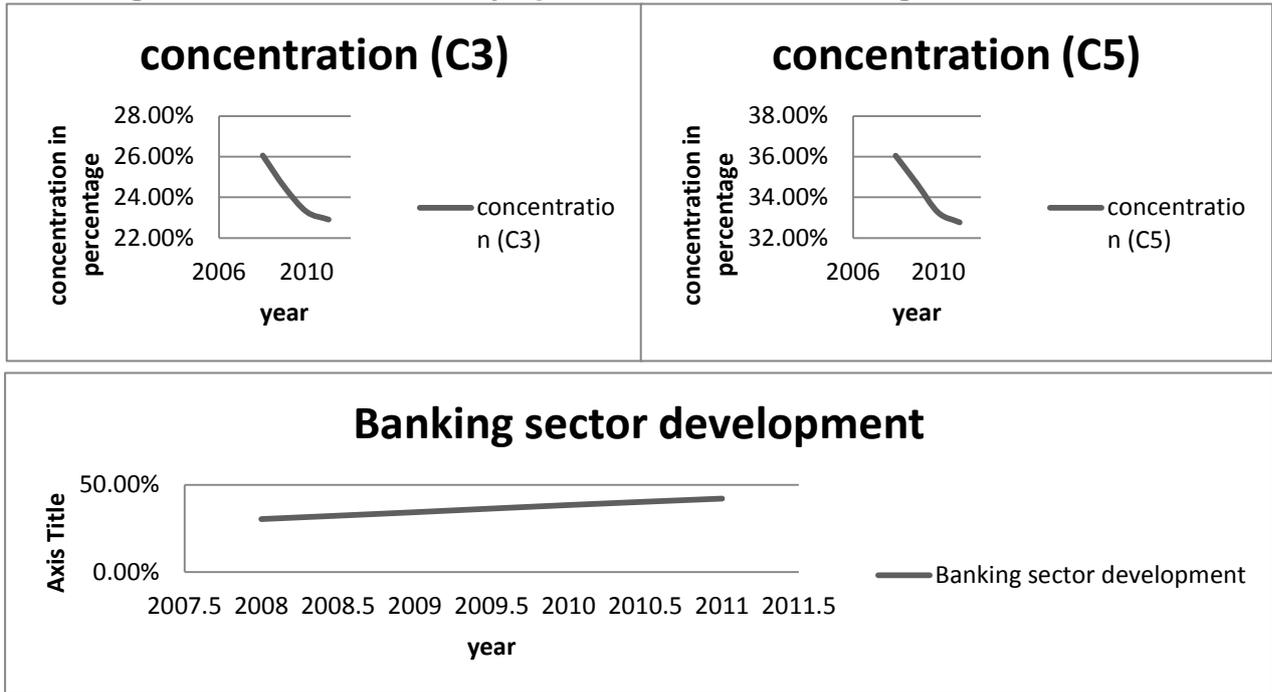


Figure 4: Trend of industry specific variables of Bangladeshi banks



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Table3: Cross Correlation Matrix

ROA	1													
NIM	0.25	1												
Size	0.09	0.17	1											
Risk	-0.26	0.07	-0.12	1										
Loan to total Asset	0.02	-0.16	0.09	-0.21	1									
Taxation	-0.66	-0.10	0.12	0.12	-0.06	1								
Capital	0.59	0.23	0.16	-0.19	-0.03	-0.43	1							
Cost	0.10	0.30	0.04	0.14	-0.48	-0.09	0.03	1						
Nontraditional	0.26	-0.49	-0.24	0.09	-0.21	-0.20	0.20	0.07	1					
Labor productivity	0.48	-0.09	0.49	-0.21	0.12	-0.12	0.40	-0.08	0.24	1				
C (3)	0.03	0.29	0.06	0.07	-0.03	0.21	-0.21	0.22	-0.04	0.18	1			
C (5)	0.02	0.27	0.07	0.06	-0.005	0.21	-0.22	0.21	-0.04	0.19	0.99	1		
Banking Sector	-0.06	-0.24	-0.09	0.005	-0.03	-0.17	0.21	-0.22	0.02	-0.20	-0.97	-0.99	1	
Inflation	-0.06	0.23	-0.15	0.32	-0.31	0.12	0.05	-0.001	-0.02	-0.04	0.05	-0.02	0.18	1

5.1 Cross Correlation Matrix

Table 3 provides information on the degree of correlation between the explanatory variables used in the multivariate regression analysis. The matrix shows that the correlation between the independent variables is not strong. At first, capitalization and labor productivity shows a positive and significant relationship with profitability, when ROA is used as the dependent variable. On the other hand taxation has a negative affect when ROA is used as the dependent variable. Again, nontraditional activity has negative affect when NIM is used as the dependent variable. The regression model examines how the value taken by independent variable influences the value of the dependent variables ROA and NIM.

Table3: Regression Co-efficient of the variables

	Coefficient (byx)	Coefficient (byx)
Size	0.000000000000012	0.0000000000000418
Risk	-0.3357	0.1553
Loan to total Asset	0.0027	-0.0386
Taxation	-0.0643	-0.0176
Capital	0.1983	0.1410
Cost	0.0908	0.5156
Nontraditional	0.0165	-0.0567
Labor productivity	0.0000000023	-0.0000000008
C (3)	0.0162	0.3210
C (5)	0.0088	0.2835
Banking Sector	-0.0098	-0.0748
Inflation	-0.0003	0.0018

6. Findings

6.1 Relationship between Bank Specific Determinants and Profitability

Starting with ROA, a positive coefficient with bank size indicates positive relationship with bank size. The result is supported by Kosmidou, Tanna and Pasiouras (2002), Alper and Anbar (2011) and Khrawish (2011).

The coefficient of credit risk entered into the regression model represents a negative relationship between credit risk and bank profitability. This result is also supported by Davydenko (2010), Ali, Akhtar and Ahmed (2011), Sufian (2011) and Ramlall (2009).

The coefficient of Loan to total Asset entered into the regression model showed a positive relationship between Loan to total Asset and bank profitability.

In a taxation scenario, the variable is negatively related to the profitability of the bank, signifying a negative relationship. The more taxes paid by the bank leads to higher costs incurred by the bank.

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In terms of capital, the variable is positively related to bank profitability in Bangladesh indicating a positive relationship between capital and profitability.

The study finds that cost efficiency and labor productivity are positively associated with ROA.

Considering NIM as a dependent variable, bank size, credit risk, capitalization and cost efficiency have a positive relationship with the net interest margin.

On the other hand, Loan to total Asset, taxation, nontraditional activity and labor productivity have a negative relationship with the net interest margin.

6.2 Relationship between Industry specific determinants and Profitability

Considering both ROA and NIM as dependent variables, they are positively associated with banking profitability. On the other hand, bank sector development has a negative relationship with ROA and NIM.

6.3 Relationship between Macroeconomic determinants and Profitability

In terms of ROA, inflation is found to be negatively linked to bank profitability. In terms of NIM, the relationship is positive because it gives banks the opportunity to adjust the interest rates accordingly, resulting in revenues that increase faster than costs with a positive impact on profitability.

While previous studies and their models have examined the impacts on bank profitability in terms of limited number of variables, this study examined the impacts on the performance of the selected banks in terms of a wider range of variables. Therefore the results are statistically robust.

7. Conclusion

The findings indicate that bank size, higher cost efficiency, capitalization, and higher concentration tend to increase the profitability of Bangladesh banks. On the other hand, higher taxation, higher banking assets to GDP tend to decrease profitability in the Bangladeshi banking sector.

There are mixed findings about the effect of credit risk, Loan to total Asset, nontraditional activity, labor productivity and inflation on Bangladeshi banking profitability in terms of ROA and NIM. Lower credit risk appears to increase the NIM of Bangladeshi banks, while higher NIM can also be explained by a lower Loan to Total Asset ratio of Bangladeshi banks. On the other hand, higher labor productivity and higher nontraditional activity leads to higher ROA of Bangladeshi banks.

The negative relationship between inflation and profitability in terms of ROA in the Bangladeshi banking sector reflects the fact that inflation in Bangladesh cannot be fully

predicted and interest rates are not adjusted accordingly. This may be due to underlying economic policy factors yet to be identified and critically evaluated through empirical research.

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