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DETERMINANTS OF BANK PROFITABILITY IN A DEVELOPING ECONOMY: EMPIRICAL EVIDENCE FROM BANGLADESH

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Abstract. This study seeks to examine the performance of 37 Bangladeshi commercial banks between 1997 and 2004. The empirical findings of this study suggest that bank specific characteristics, in particular loans intensity, credit risk, and cost have positive and significant impacts on bank performance, while non-interest income exhibits negative relationship with bank profitability. During the period under study the results suggest that the impact of size is not uniform across the various measures employed. The empirical findings suggest that size has a negative impact on return on average equity (ROAE), while the opposite is true for return on average assets (ROAA) and net interest margins (NIM). As for the impact of macroeconomic indicators, we conclude that the variables have no significant impact on bank profitability, except for inflation which has a negative relationship with Bangladeshi banks profitability.

Keywords: banks, profitability, multivariate regression analysis, Bangladesh.

1. Introduction

The main role of a financial system is to assist the flow of funds from savers to borrowers. If a financial system is efficient, then it should show profitability improvements, increasing volume of funds flowing from savers to borrowers, and better quality services for consumers. Unlike in other developed nations where financial markets as well as the banking system work in unison to channel those funds, in developing countries financial markets are undersized and sometimes completely absent. It falls on the banks to bridge the gap between savers and borrowers and to perform all tasks associated with the profitable and secure channeling of funds. The banking sector also plays an important economic role in providing financial intermediation and economic acceleration by converting deposits into productive investments. This entails the study of banking sector performance in developing economies of greater significance.

The paper seeks to examine the performance of the Bangladeshi banking sector over the period 1997–2004, which is characterized as a time of significant reform in the country's banking sector. Since the National Commission of Money, Credit and Banking recommendations for broad structural changes in Bangladesh's financial intermediation system, a series of actions have been taken by the Bangladesh Bank to improve the soundness, competitiveness, and efficiency of the banking system. Among others, measures have been taken to improve transparency, deregulate interest rates, strengthening loan classification standards, and reducing Bangladesh Bank's control over financial transactions and loan recovery measures.

These measures have resulted in Bangladeshi banks attempting to diversify and strengthen their portfolios and also led to both the improvement in non-performing loan ratios and significant rise in interest-related income for all Bangladeshi banks. However, the overall profitability has remained unstable despite the programme of reforms. Ball and Feltenstein (2001) suggest that reform in Bangladesh should be centered on allowing banks to restrict the extension of credit to borrowers in certain risk categories, which is prohibited in Bangladesh.

The paper was initiated by a series of questions. Why are some commercial banks more successful than oth-

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ers? To what extent are discrepancies in banks' profitability due to variation in endogenous factors under the control of bank management, and to what extent do external factors impact the financial performance of these banks? Answers to these questions would be helpful to identify the determinants of successful commercial banks in order to formulate going forward policies for improved profitability of these banks.

The present study contributes to the existing literature by providing new empirical evidence of the factors that influence bank profitability in a developing economy. While there has been extensive literature examining the profitability of banking sectors in developed countries, empirical works on factors that influence the performance of banks in developing economies are relatively scarce (Akhavein *et al*. 1997). Furthermore, at the present time, this type of analysis is completely missing in the literature concerning the banking sector in Bangladesh.

This paper is structured as follows. The next section reviews the related studies in the literature, followed by a section that outlines the econometric framework. Section 4 reports the empirical findings. Finally, section 5 concludes and offers avenues for future research.

2. Related studies

The performance of the banking sector is a subject that has received a lot of attention in recent years. There is now a large literature which has examined the role played by management of resources in determining bank performance. It is generally agreed that better quality management of resources is the main factor contributing to bank performance, as evidenced by numerous studies that have focused on the U.S. banking system (DeYoung and Rice 2004; Stiroh and Rumble 2006; Bhuyan and Williams 2006; Hirtle and Stiroh 2007) and the banking systems in the western and developed countries (Ho and Tripe 2002; Williams 2003; Pasiouras and Kosmidou 2007; Kosmidou *et al.* 2007; Kosmidou and Zopounidis 2008; Athanasoglou *et al.* 2007; Albertazzi and Gambacorta 2008).

By contrast, fewer studies have looked at bank performance in developing economies. Guru *et al.* (2002) investigate the determinants of bank profitability in Malaysia. They used a sample of 17 commercial banks during the 1986 to 1995 period. The profitability determinants were divided into two main categories, namely the internal determinants (liquidity, capital adequacy, and expenses management) and the external determinants (ownership, firm size, and economic conditions). The findings revealed that efficient expenses management was one of the most significant in explaining high bank profitability. Among the macro indicators, high interest ratio was associated with low bank profitability and inflation was found to have a positive effect on bank performance.

Chantapong (2005) investigates the performance of domestic and foreign banks in Thailand during the period 1995–2000. All banks were found to have reduced their credit exposure during the crisis years and have gradually improved their profitability during the post-crisis years. The results indicate that foreign bank profitability is higher than the average profitability of the domestic banks although importantly, in the post-crisis period, the gap between foreign and domestic bank profitability has closed, suggesting that the financial restructuring program has yielded some positive results.

Heffernan and Fu (2008) examine the performance of different types of Chinese banks during the period 1999 and 2006. The results suggest economic value added and the net interest margin do better than the more conventional measures of profitability, namely return on average asset (ROAA) and return on average equity (ROAE). Some macroeconomic variables and financial ratios are significant with the expected signs. Though the type of bank is influential, bank size is not. Neither the percentage of foreign ownership nor bank listings have a discernible effect.

Ben Naceur and Goaied (2008) examine the impact of bank characteristics, financial structure, and macroeconomic conditions on Tunisian banks' net-interest margin and profitability during the period of 1980 to 2000. They suggest that banks that hold a relatively high amount of capital and higher overhead expenses tend to exhibit higher net-interest margin and profitability levels, while size is negatively related to bank profitability. During the period under study, they find that stock market development has positive impact on banks' profitability. The empirical findings suggest that private banks are relatively more profitable than their state owned counterparts. The results suggest that macroeconomic conditions have no significant impact on Tunisian banks' profitability.

Ben Naceur and Omran (2008) examine the influence of bank regulations, concentration, financial and institutional development on Middle East and North Africa (MENA) countries commercial banks margin and profitability during the period 1989–2005. They find that bank specific characteristics, in particular bank capitalization and credit risk, have positive and significant impact on banks' net interest margin, cost efficiency, and profitability. On the other hand, macroeconomic and financial development indicators have no significant impact on bank performance.

In a comprehensive study, Dermiguc Kunt and Huizinga (1999) examine the determinants of bank interest margins and profitability using bank level data for 80 countries from 1988 to 1995. They find that a larger ratio of bank assets to GDP and a lower market concentration ratio lead to lower margins and profits. The findings also suggest that foreign banks have higher margins and profits than domestic banks in developing countries, while the opposite prevails in developed countries.

Dermiguc Kunt and Huizinga (2001) present evidence of the impact of financial development and structure on bank profitability using bank level data for a large number of developed and developing countries over the 1990–1997 period. The paper finds that financial development has a very important impact on bank performance. They find that higher bank development is related to lower bank performance, due to tougher competition. On the other hand, stock market development leads to higher profitability and margin for banks, particularly at lower levels of financial development suggesting complementariness between the banking sector and the stock market.

Pasiouras and Kosmidou (2007) examine the performance of domestic and foreign commercial banks in 15 EU countries during the period 1995–2001. They find that profitability of both domestic and foreign banks is affected not only by bank specific characteristics, but also by financial market structure and macroeconomic conditions. The results suggest that all variables have significant relationship with bank profitability, although their impacts and relation is not always uniform for domestic and foreign banks.

More recently, Kosmidou (2008) examined the determinants of performance of Greek commercial banks during the period 1990–2002. He found that profitability is positively associated with well capitalized banks and lower cost to income ratios. He also suggests that the growth of gross domestic product (GDP) is positively related to bank profitability, while inflation rate is negatively related to bank profitability during the period under study.

3. Data and methodology

We collected our bank specific variables from the financial statements of a sample of commercial banks operating in Bangladesh over the period 1997–2004 available in the Bankscope database of Bureau van Dijk's company. The macroeconomic variables are retrieved from IMF Financial Statistics (IFS) database. The total number of commercial banks operating in Bangladesh varied from 21 banks in 1997 and 1998, 30 banks in 1999, 33 banks in 2000, 35 banks in 2001, 2002, and 2003, and 34 banks in 2004 (see Appendix 1). This gives us a total of 129 bank year observations.

Table 1 lists the variables used to proxy profitability and its determinants. We also include the notation and the expected effect of the determinants according to the literature.

Table 1. Descriptive account of the variables used in the regression models

Variable	Description	Hypothesized Relationship with Efficiency
Dependent		
ROAA	The return on average total assets of the bank	
ROAE	The return on average total shareholder equity of the bank	
NIM	The net interest margin of the bank	
Independent		
Bank specific characteristics (internal factor)		
LOANS/TA	Total loans over total assets	+/–
LNTA	Natural logarithm of total assets	+/–
LLP/TL	Loan loss provisions over total loans	–
NII/TA	Non-interest income over total assets	+
NIE/TA	Non-interest expense over total assets	–
EQASS	Total book value of shareholders equity over total assets	+/–
Macroeconomic conditions (external factors)		
LNGDP	Natural logarithm of gross domestic products	+/–
INFL	The annual inflation rate	+/–

Note: The data for the calculation of internal factors were obtained from Bankscope Database. The data for external factors were obtained from International Monetary Fund's (IMF) International Financial Statistics database.

3.1. Dependent variables

In the literature, bank performance is typically measured by return on average assets (ROAA), return on average equity (ROAE), and/or net interest margins (NIM) and is usually expressed as a function of internal and external determinants. Internal determinants are factors that are mainly influenced by a bank's management decisions and policy objectives. Such profitability determinants are the level of liquidity, provisioning policy, capital adequacy, expenses management, and bank size. On the other hand, the external determinants both industry and macroeconomic related, are variables that reflect the economic and legal environments where the financial institution operates.

ROAA shows the profit earned per dollar of assets and, most importantly, reflects the management ability to utilize the bank's financial and real investment resources to generate profits (Hassan and Bashir 2003). For any bank, ROAA depends on the bank's policy decisions as well as uncontrollable factors relating to the economy and government regulations. Many regulators believe ROAA is the best measure of bank profitability (Hassan and Bashir 2003). Rivard and Thomas (1997) suggest that bank profitability is best measured by ROAA in that ROAA is not distorted by high equity multipliers and ROAA represents a better measure of the ability of the firm to generate returns on its portfolio of assets. ROAE, on the other hand, reflects how effectively a bank management is using its shareholders funds. Since returns on assets tend to be lower for financial intermediaries, most banks utilize financial leverage heavily to increase return on equity to a competitive level (Hassan and Bashir 2003).

3.2. Determinants and independent variables

The independent variables used to explain bank profitability are grouped under two main characteristics. The first represent bank specific attributes, while the second encompass economic conditions during the period examined. The bank specific variables included in the regressions are: LOANS/TA (total loans divided by total assets), LOGTA (log of total assets), LLP/TL (loans loss provisions divided by total loans), NII/TA (non-interest income divided by total assets), NIE/TA (total overhead expenses divided by total assets), and EQASS (book value of stockholders' equity as a fraction of total assets).

Liquidity risk, arising from the possible inability of banks to accommodate decreases in liabilities or to fund increases on the assets' side of the balance sheet, is considered an important determinant of bank profitability. The loans market, especially credit to households and firms, is risky and has a greater expected return than other bank assets, such as government securities. Thus, one would expect a positive relationship between liquidity (LOANS/TA) and profitability (Bourke 1989). It could be the case, however, that the fewer the funds tide up in liquid investments, the higher we might expect profitability to be (Eichengreen and Gibson 2001).

Bank size (LOGTA) is generally used to capture potential economies or diseconomies of scale in the banking sector. This variable controls for cost differences in product and risk diversification according to the size of the financial institution. The first factor could lead to a positive relationship between size and bank profitability, if there are significant economies of scale (Akhavein *et al.* 1997; Bourke 1989; Molyneux and Thornton 1992; Bikker and Hu 2002; Goddard *et al.* 2004), while the second to a negative one, if increased diversification leads to lower credit risk and thus lower returns. Other researchers however conclude that marginal cost savings can be achieved by increasing the size of the banking firm, especially as markets develop (Berger *et al.* 1987; Boyd and Runkle 1993; Miller and Noulas 1997; Athanasoglou *et al.* 2007). Eichengreen and Gibson (2001) suggest that the effect of a growing bank's size on profitability may be positive up to a certain limit. Beyond this point the effect of size could be negative due to bureaucratic and other reasons. Hence, the size-profitability relationship may be expected to be non-linear.

The ratio of loan loss provisions to total loans (LLP/TL) is incorporated as an independent variable in the regression analysis as a proxy of credit risk. Changes in credit risk may reflect changes in the health of a bank's loan portfolio (Cooper *et al*. 2003), which may affect the performance of the institution. Duca and McLaughlin (1990), among others, conclude that variations in bank profitability are largely attributable to variations in credit risk, since increased exposure to credit risk is normally associated with decreased firm profitability. This triggers discussions concerning not the volume but the quality of loans made. In this direction, Miller and Noulas (1997) suggest that the more financial institutions are exposed to high risk loans, the higher the accumulation of unpaid loans and the lower the profitability.

To recognize that financial institutions in recent years have increasingly been generating income from "off-balance sheet" business and fee income generally, the ratio of non-interest income over total assets (NII/TA) is entered in the regression analysis as a proxy for non-traditional activities. Non-interest income consists of commission, service charges, and fees, guarantee fees, net profit from sale of investment securities, and foreign

exchange profit. The ratio is also included in the regression model as a proxy measure of bank diversification into non-traditional activities. The variable is expected to exhibit positive relationship with bank profitability.

The ratio of overhead expenses to total assets, NIE/TA, is used to provide information on the variations of bank operating costs. The variable represents total amount of wages and salaries, as well as the costs of running branch office facilities. For the most part, the literature argues that reduced expenses improve the efficiency and hence raise the profitability of financial institutions, implying a negative relationship between operating expenses ratio and profitability (Bourke 1989). However, Molyneux and Thornton (1992) observed a positive relationship, suggesting that high profits earned by firms may be appropriated in the form of higher payroll expenditures paid to more productive human capital[1]. In any case, it should be appealing to identify the dominant effect, in a developing banking environment like Bangladesh.

EQASS variable is included in the regressions to examine the relationship between profitability and bank capitalization. Even though leverage (capitalization) has been demonstrated to be important in explaining the performance of financial institutions, its impact on bank profitability is ambiguous. A lower capital ratio suggests a relatively risky position, one might expect a negative coefficient on this variable (Berger 1995). However, it could be the case that higher levels of equity would decrease the cost of capital, leading to a positive impact on bank profitability (Molyneux 1993). An increase in capital may raise expected earnings by reducing the expected costs of financial distress, including bankruptcy (Berger 1995). Furthermore, strong capital structure is essential for financial institutions in developing economies, since it provides additional strength to withstand financial crises and increased safety for depositors during unstable macroeconomic conditions.

Bank profitability is sensitive to macroeconomic conditions despite the trend in the industry towards greater geographic diversification and larger use of financial engineering techniques to manage risk associated with business cycle forecasting. Generally, higher economic growth encourages bank to lend more and permits them to charge higher margins, as well as improving the quality of their assets. Neely and Wheelock (1997) use per capita income and suggest that this variable exerts a strong positive effect on bank earnings. Dermiguc Kunt and Huizinga (2001) and Bikker and Hu (2002) identify possible cyclical movements in bank profitability, i.e. the extent to which bank profits are correlated with the business cycle[2]. Their findings suggest that such correlation exists, although the variables used were not direct measures of the business cycle. To measure the relationship between economic and market conditions and bank profitability, LNGDP (natural log of GDP) and INFL (inflation rate) are used. Table 2 presents the summary statistics of the dependent and explanatory variables.

3.3. Econometric specification

To test the relationship between bank profitability and the bank specific and macroeconomic determinants described earlier, we estimate a linear regression model in the following form:

$$\ln(\pi)_{it} = \alpha + \beta_1 \ln(LLP/TL)_{it} + \beta_2 \ln(TA)_{it} + \beta_3 \ln(NII/TA)_{it} + \beta_4 \ln(NIE/TA)_{it} + \beta_5 \ln(EQASS)_{it} + \zeta_1 \ln(GDP) + \zeta_2 \ln(GDPCAP) + \zeta_3 \ln(INFL) + \varepsilon_{it}$$
$$\varepsilon_{it} = v_{it} + u_{it}, \quad (1)$$

where '*i*' denotes the bank, '*t*' the examined time period, and ε is the disturbance term, with v_{it} capturing

Table 2. Summary statistics of dependent and explanatory variables

	ROAA	ROAE	NIM	LOANS/TA	LNTA	LLP/TL	NII/TA	NIE/TA	EQASS	LNGDP	INFL
Mean	0.499	15.045	2.224	59.965	9.988	11.330	3.037	4.124	3.754	7.674	4.920
Min	0.030	–899.650	–2.800	45.850	9.227	4.880	1.890	2.440	1.460	7.495	1.908
Max	3.870	422.730	12.180	94.840	12.926	90.540	6.940	15.920	68.870	7.861	8.648
Std. Dev.	1.815	70.012	1.652	16.018	1.271	9.976	1.274	1.829	8.122	0.113	1.980

Note: The table presents the summary statistics of the variables used in the regression analysis.

[1] A guess would be that such relationship is observed in developed banking systems, which hire high quality and therefore, high cost staff. Hence, providing that the high quality staff is sufficiently productive, such banks will not be disadvantaged from a relative point of view.

[2] In a contestable market, active firms are vulnerable to "hit and run" entry. For its existence, sunk costs must be largely absent. In the banking industry, some argue that most of the costs are fixed but not sunk, making it contestable.

the unobserved bank specific effect, and u_{it} is the idiosyncratic error and is independently identically distributed (i.i.d), $e_{it} \sim N(0, \sigma^2)$.

Following De Bandt and Davis (2000) and Staikouras *et al.* (2008) among others, the log linear form is chosen as it typically improves the regression's goodness of fit and may reduce simultaneity bias. We apply the least square method of fixed effects model (FEM). The opportunity to use a fixed effects rather than a random effects model has been tested with the Hausman test. Equation (1) is estimated by using White's (1980) transformation to control for cross section heteroscedasticity of the variables.

Table 3 provides information on the degree of correlation between the explanatory variables used in the multivariate regression analysis. The matrix shows that in general the correlation between the bank-specific variables is not strong thus suggesting that multicollinearity problems are not severe or non-existent. Kennedy (2008) states that multicollinearity is a problem when the correlation is above 0.70, which is not the case here.

4. Empirical findings

The regression results focusing on the relationship between bank profitability and the explanatory variables are presented in Table 4. To conserve space, the full regression results, which include both the bank and time specific fixed effects, are not reported in the paper. The model performs reasonably well with most variables remain stable across the various regressions tested. The explanatory power of the models is reasonably high, while the *F*-statistics for all models is significant at the 1% level. The adjusted R^2 is also considerably higher than obtained by Williams (2003), Staikouras and Wood (2003), and Kosmidou *et al.* (2007).

LOANS/TA entered all the regression models with a positive sign and is statistically significant at the 5% level or better in all cases. The findings imply that banks with higher loans-to-asset ratios tend to be more profitable. Thus, in the case of the Bangladeshi banking sector, bank loans seem to be more highly valued than alternative bank outputs such as investments and securities. The result is consistent with earlier studies

Table 3. Spearman ρ and Pearson Correlation Matrix between explanatory variables

The notation used in the table below is defined as follows: LLP/TL is a measure of bank risk calculated as the ratio of total loan loss provisions divided by total loans; NII/TA is a measure of bank diversification towards non–interest income, calculated as total non–interest income divided by total assets; NIE/TA is a proxy measure for management quality, calculated as personnel expenses divided by total assets; LOANS/TA is used as a proxy measure of loans intensity, calculated as total loans divided by total assets; LOGTA is a proxy measure of size, calculated as a natural logarithm of total bank assets; EQASS is a measure of capitalization, calculated as book value of shareholders equity as a fraction of total assets; LNGDP is natural log of gross domestic products; INFL is the inflation rate.

	LNTA	**LLP/TL**	**NII/TA**	**NIE/TA**	**EQASS**	**LNGDP**	**INFL**
LOANS/ TA	**0.361** (**0.286**)	*0.202* (0.139)	*0.126* (**0.347**)	**0.209** (**0.353**)	–0.118 (0.024)	**0.329** (**0.170**)	0.003 (0.036)
LNTA		**0.595** (**0.451**)	–0.069 (0.045)	–0.013 (–0.058)	**–0.528** (**–0.540**)	**0.216** (**0.203**)	0.051 (0.070)
LLP/TL			–0.129 (–0.095)	0.055 (–0.044)	**–0.453** (**–0.405**)	*–0.198* (*–0.222*)	0.064 (0.057)
NII/TA				**0.430** (**0.460**)	0.027 (**–0.208**)	**0.220** (**0.197**)	–0.038 (–0.057)
NIE/TA					–0.016 (0.126)	**0.202** (**0.208**)	–0.059 (–0.041)
EQASS						0.105 (0.085)	0.026 (0.050)
LNGDP							–0.072 (–0.051)

Italics: Correlation is significant at the 0.05 level (2-tailed)
Bold: Correlation is significant at the 0.01 level (2-tailed)

Note: In parentheses Pearson correlation coefficients are given.

Table 4. Multivariate regressions results

$$\ln(\pi)_{it} = \alpha + \beta_1 \ln(LLP/TL)_{it} + \beta_2 \ln(TA)_{it} + \beta_3 \ln(NII/TA)_{it} + \beta_4 \ln(NIE/TA)_{it} + \beta_5 \ln(EQASS)_{it} + \zeta_1 \ln(GDP) + \zeta_3 \ln(INFL) + \varepsilon_{it}$$

The dependent variables used are ROAA, ROAE, and NIM; LOANS/TA is total loans divided by total assets; LOGTA is natural logarithm of total bank assets; LLP/TL is the ratio of total loan loss provisions divided by total loans; NII/TA is total non–interest income divided by total assets; NIE/TA is non–interest expenses divided by total assets; EQASS is book value of shareholders equity as a fraction of total assets; LNGDP is natural log of gross domestic products; INFL is the rate of inflation.

	(1) ROAA	(2) ROAA	(3) ROAE	(4) ROAE	(5) NIM	(6) NIM
CONSTANT	2.936914*** (61.11050)	–0.000999 (–0.000122)	5.211802*** (7.994746)	14.18727 (0.182524)	2.658717*** (46.65445)	5.604136 (0.630291)
Bank Characteristics						
LOANS/TA	0.011383** (2.15296)	0.011582** (2.176391)	0.175080*** (2.649186)	0.182901** (2.537420)	0.018050* (1.769914)	0.018355* (1.832604)
LOGTA	0.005564* (1.812718)	0.006162 (1.429484)	–0.364058*** (–5.028607)	–0.406640*** (–4.025229)	0.017152** (1.990542)	0.021426*** (4.462988)
LLP/TL	0.029442*** (6.163133)	0.029473*** (5.474964)	0.346490*** (6.336712)	0.355335*** (6.295094)	–0.027917 (–1.574173)	–0.024338 (–1.562183)
NII/TA	–0.066961*** (–2.659736)	–0.066145** (–2.376694)	–1.109035*** (–2.838891)	–1.089845*** (–2.821356)	0.031487 (0.718086)	0.037887 (0.763001)
NIE/TA	0.015289 (1.326831)	0.014247 (0.835154)	0.009034 (0.058142)	–0.018697 (–0.103377)	0.068780*** (4.219786)	0.054804*** (2.730812)
EQASS	0.007996 (1.416591)	0.009148 (0.528118)	–0.030074 (–0.458712)	–0.116743 (–0.654863)	0.012845*** (2.637131)	0.029013 (0.965950)
Economic Conditions						
LNGDP		–0.386513 (–0.367258)		2.628305 (0.260246)		0.256742 (0.211290)
INFL		–0.003443 (–0.515956)		–0.073436 (–1.005987)		–0.012146** (–2.147871)
R^2	0.770669	0.771589	0.703012	0.711430	0.775677	0.782803
Adjusted R^2	0.687719	0.678719	0.592049	0.590099	0.694539	0.694492
Durbin–Watson stat	2.140742	2.117584	2.289281	2.258473	1.393510	1.418510
F–statistic	9.290806***	8.308243***	6.335565***	5.863569***	9.559946***	8.864181***
No. of Observations	129	129	126	126	129	129

Values in parentheses are *t*-statistics.
***, **, and * indicate significance at 1, 5, and 10% levels.

by among others Molyneux and Thornton (1992), Guru *et al.* (2002), and Pasioura and Kosmidou (2007).

Referring to the relationship between size (LOGTA) and performance, the results are mixed. The coefficient of LOGTA is statistically significant and negative in the ROAE regression model. The negative coefficient indicates that larger (smaller) banks tend to earn lower (higher) profits. On the other hand, the relation between size (LOGTA) and bank performance is statistically significant and positive in the NIM regression model. Hauner (2005) offers two potential explanations for which size could have a positive impact on bank performance. First, if it relates to market power, large banks should pay less for their inputs. Second, there may be increasing returns to scale through the allocation of fixed costs (e.g. research or risk management) over a higher volume of services or from efficiency gains from a specialized workforce.

It is interesting to note that the coefficient of LLP/TL reveals a positive relationship with bank profitability and is statistically significant at the 1% level in the ROAA and ROAE regression models. The empirical finding is in consonance with Berger and DeYoung's (1997) *skimping* hypothesis. Berger and DeYoung (1997) suggest that under the *skimping* hypothesis, a bank maximizing the long run profits may rationally choose to have lower costs in the short run by skimping on the resources devoted to underwriting and monitoring loans, but bear the consequences of greater loan performance problems.

The coefficient of NII/TA variable entered the regression model with a negative sign and is statistically significant at the 1% level in the ROAA and ROAE regression models. The results imply that bank which derived a higher proportion of its income from non-interest sources such as fee-based services tend to report a lower level of profitability. The empirical findings provide support to earlier studies by among others Stiroh and Rumble (2006). To recap, Stiroh and Rumble (2006) find that diversification benefits of the U.S. financial holding companies are offset by the increased exposure to non-interest activities, which are much more volatile but not necessarily more profitable than interest generating activities.

On the other hand, NIE/TA consistently exhibits positive relationship with bank performance and is statistically significant at the 1% level in the NIM regression model supporting the expense preference behavior in the Bangladeshi banking sector. There are a few plausible explanations. Firstly, as suggested by Sathye (2001), the more highly qualified and professional management may require higher remuneration packages and thus a highly significant positive relationship with profitability measure is natural. Secondly, as suggested by Claessens *et al.* (2001), although overstaffing may lead to the deterioration of bank profitability levels in the middle-income countries, the same could not be hold true for banks operating in the middle and high income countries.

Capital strength as measured by EQASS is positively related to bank profitability and is statistically significant at the 1% level in the NIM regression model. The result is consistent with previous studies (Isik and Hassan 2003; Staikouras and Wood 2003: Goddard *et al.* 2004; Pasiouras and Kosmidou 2007; Kosmidou 2008) providing support to the argument that well capitalized banks face lower costs of going bankrupt, thus lower their cost of funding, or that they have lower needs for external funding resulting in higher profitability. Nevertheless, strong capital structure is essential for financial institutions in emerging economies since it provides additional strength to withstand financial crises and increased safety for depositors during unstable macroeconomic conditions.

The empirical findings seem to suggest mixed impact of the indicators of macroeconomic conditions on bank performance. Inflation (INFL) is negatively related to NIM, implying that during the period of our study the levels of inflation were unanticipated by Bangladeshi banks. This does not allow bank managements the opportunity to adjust the interest rates accordingly and consequently to earn lower interest margin. On the other hand, the empirical findings seem to suggest that economic growth (LNGDP) is not significantly related to bank performance. The results are in line with the earlier finding by Ben Naceur and Omran (2008).

5. Concluding remarks

The South Asian countries, like other developing countries, have undergone noteworthy financial reforms that significantly affected the banking system. To date, most academic studies on the impact of these reforms on the performance of financial institutions in emerging economies focus on large countries, i.e. China. However, little is known about the performance of financial institutions in the South Asian countries.

By using an unbalanced bank level panel data, this study seeks to examine the performance of 37 Bangladeshi commercial banks between 1997 and 2004. The empirical findings of this study suggest that bank specific characteristics, in particular loans intensity, credit risk, and cost have positive and significant impacts on bank performance, while non-interest income exhibits negative relationship with bank profitability. During the period under study the results suggest that the impact of size is not uniform across the various measures employed. The empirical findings suggest that size has negative impact on return on average equity (ROAE), while the opposite is true for return on average assets and net interest margin. As for the impact of macroeconomic indicators, we conclude that the variables have no significant impact on bank profitability, except for inflation, which has negative relationship with Bangladeshi banks profitability.

The findings of this study have considerable policy relevance. It could be argued that the more profitable bank will be able to offer more new products and services. To this end, the role of technology advancement is particularly important given that a bank with relatively more advanced technologies may have added advantage over its peers. The continued success of the

Bangladeshi banking sector depends on its efficiency, profitability, and competitiveness. Furthermore, in view of the increasing competition attributed to the more liberalized banking sector, bank managements as well as the policymakers will be more inclined to find ways to obtain the optimal utilization of capacities as well as making the best use of their resources, so that these resources are not wasted during the production of banking products and services.

Moreover, the ability to maximize risk adjusted returns on investment and sustaining stable and competitive returns is an important element in ensuring the competitiveness of the Bangladeshi banking sector. Thus, from the regulatory perspective, the performance of the banks will be based on their efficiency and profitability. The policy direction will be directed towards enhancing the resilience and efficiency of the financial institutions with the aim of intensifying the robustness and stability of the banking sector.

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APPENDIX

Summary of the sample used in the study

Bank	1997	1998	1999	2000	2001	2002	2003	2004
Arab Bangladesh Bank Limited - A.B. Bank Limited	√	√	√	√	√	√	√	√
Agrani Bank Limited	√	√	√	√	√	√	√	√
Bangladesh Bank Limited			√	√	√	√	√	√
Bangladesh Commerce Bank Limited				√	√	√	√	√
Bangladesh Krishi Bank Limited	√	√	√	√	√	√	√	√
Bangladesh Shilpa Bank Limited			√	√	√	√	√	
Bangladesh Shilpa Rin Shangstha Limited	√	√	√	√				
BASIC Bank Ltd - Bangladesh Small Industries & Commerce Bank Limited	√	√	√	√	√	√	√	√
Bank Asia Limited			√	√	√	√	√	√
BRAC Bank Limited					√	√	√	√
City Bank Limited	√	√	√	√	√	√	√	√
Dhaka Bank Limited	√	√	√	√	√	√	√	√
Dutch-Bangla Bank Limited	√	√	√	√	√	√	√	√
Eastern Bank Limited	√	√	√	√	√	√	√	√
Export Import Bank of Bangladesh Limited			√	√	√	√	√	√
First Security Bank Limited			√	√	√	√	√	√
IFIC Bank Limited - International Finance Investment and Commerce Bank Limited	√	√	√	√	√	√	√	√
Islami Bank Bangladesh Limited	√	√	√	√	√	√	√	√
Jamuna Bank Limited					√	√	√	√
Janata Bank Limited	√	√	√	√	√	√	√	√
Mercantile Bank Limited			√	√	√	√	√	√
Mutual Trust Bank Limited				√	√	√	√	√
National Bank Limited	√	√	√	√	√	√	√	√
National Credit and Commerce Bank Limited	√	√	√	√	√	√	√	√
One Bank Limited			√	√	√	√	√	√
Premier Bank Limited (The)			√	√	√	√	√	√
Prime Bank Limited	√	√	√	√	√	√	√	√
Pubali Bank Limited	√	√	√	√	√	√	√	√
Rupali Bank Limited	√	√	√	√	√	√	√	√
Shahjalal Bank Limited					√	√	√	√
Sonali Bank Limited	√	√	√	√	√	√	√	√
Southeast Bank Limited	√	√	√	√	√	√	√	√
Standard Bank Limited			√	√	√	√	√	√
Trust Bank Limited (The)				√	√	√	√	√
United Commercial Bank Limited	√	√	√	√	√	√	√	√
Uttara Bank Limited	√	√	√	√	√	√	√	√