

## Determinants of Bank Profitability in Bangladesh

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### *Abstract*

*This paper specifically focuses on the performance measures, and their determinants of the banks operating in Bangladesh. By using bank specific panel data over the period 2005-2014, the paper estimates the impacts of bank specific and macroeconomic factors on bank profitability, represented by return on equity (ROE). We find that non-performing loans (NPL), foreign loans (FL) and capital adequacy ratio (CAR) have statistically significant negative impact on bank profitability while non-traditional activities (NTA)<sup>2</sup> have significant positive impact on bank profitability with a very high magnitude.*

**Keywords:** Profitability, ROE, NPL, CAR, NTA.

**JEL Classification:** E58, G21.

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<sup>1</sup> Authors are officials of Bangladesh Bank. Views expressed in the paper are authors' own and not necessarily reflect the view of Bangladesh Bank.

<sup>2</sup> Non Traditional Activities incorporated in the model with the ratio of non interest income to total assets.

## 1. Introduction

Banks are the most important financial intermediaries in Bangladesh. Most of the operations in money and capital market are carried out by groups of SCBs, PCBs, FCBs and SBs. The banking industry generally proved its resilience during the Global Financial Crisis of 2007-2008. This development was achieved due to the implementation of stringent regulatory and supervisory standards within a stable, sound and more flexible macroeconomic management framework over the past decade. Measures have also been taken to improve transparency, and internal management of the banks. In this paper we specifically focus on the performance measures, and their determinants of the banks operating in Bangladesh. By using bank specific panel data over the period 2005-2014, the paper estimates the impacts of bank specific and macroeconomic factors on bank profitability, represented by ROE. The paper is organized in the following way. It starts with reviewing the existing literature analyzing the determinants of bank profitability in different countries. This is followed by section which discusses the measures of bank profitability and their determinants. Data, methodology and empirical results are described in the following section. The final section includes the conclusion.

## 2. Literature Review

The profitability analysis of the banking sector has received immense attention in recent years. Athanasoglou et al. (2006) examined the effect of bank-specific, industry-specific and macroeconomic determinants of bank profitability over the period 1985-2001, using an empirical framework that incorporates the traditional Structure-Conduct-Performance (SCP) hypothesis. To account for profit persistence, they apply a GMM technique to a panel of Greek banks. They find that capital is important in explaining bank profitability and that increased exposure to credit risk lowers profits. Additionally, labor productivity growth has a positive and significant impact on profitability, while operating expenses are negatively and strongly linked to it, showing that cost decisions of bank management are instrumental in influencing bank performance.

Molyneux & Thornton (1992) used two-stage least squares to simultaneously model the determinants of foreign bank profitability and commercial credit extension in the United States between 1987 and 1991. Their results indicate that supply-side factors; such as capital strength, commercial and industrial loan growth and assets composition were important factors in determining foreign banks' return-on-assets in the sample period.

Roman & Danuletiu (2013) investigated the factors that have an influence upon the profitability of 15 commercial banks that operate in Romania between 2003 and 2011. Their empirical results highlight the fact that the ratio of nonperforming loans, the

management quality and the ratio of liquid assets to total assets has a significant impact upon the banking profitability. Instead, other factors, respectively the ratio of total equity to total asset, the ratio of loans to total assets, funding costs and income diversification of bank did not have an important effect upon the profitability.

Flamini et al. (2009) uses a sample of 389 banks in 41 Sub-Saharan Africa (SSA) countries to study the determinants of bank profitability. To capture the tendency of profits to be persistent over time (due to market structure imperfections or high sensitivity to autocorrelated regional or macroeconomic factors), they adopt a dynamic specification of the model, with a lagged dependent variable among the regressors. They find that bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth boost credit expansion. The results also indicate moderate persistence in profitability.

Guisse (2012) examined the performance of the Malaysian's local banks and foreign banks, and compared their profitability in the financial sector. They conclude that profitability of commercial banks can be influenced by several factors, such as liquidity, credit, capital, operating expenses, and the size of the banks.

Sufian & Habibullah (2009a) seeks to examine the performance of 37 Bangladeshi commercial banks between 1997 and 2004. The empirical findings of their 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. However, their study includes all the specialized banks that are not driven for profit motive, and have continuously experienced negative ROA and ROE. Moreover, their study does not incorporate foreign banks which contribute more than 5% of the assets and deposits of the banking industry. More surprisingly they include Bangladesh Bank in their study which is the central bank regulating the banking industry not a commercial bank. Given the above discussions on the literature, it seems that there is a space of more research to derive the determinants of bank profit profitability in Bangladesh.

### 3. Bank Profitability Measures and their Determinants

#### a. Bank Specific Determinants

- **Capital Risk:** To capture the capital risk we have used CAR which measures the impact of capital requirements on banks' profitability.
- **Credit Risk:** Credit risk of the banks on profitability is incorporated in the model by NPL.

- **Liquidity Risk (LR):** Liquidity risk is measured by the ratio of total loans to total assets.
- **Management Quality (MQ):** Management quality is represented by operating expenditure to total assets ratio.
- **Non Traditional Activities:** Non Traditional Activities incorporated in the model with the ratio of non interest income to total assets.

#### **b. Macroeconomic Determinants**

- **Foreign Loans:** Foreign loan inflows in the country is assumed to adversely affect the profitability of the domestic banking industry.
- **Economic Growth:** Measured by GDP growth (GROWTH\_BD) is expected to influence bank profitability positively because the default risk of bank loans is lower in economic upturns.

### **4. Data and Methodology**

We have used a balanced panel data set<sup>3</sup> of 42 commercial banks (4 SCBs, 30 PCBs & 8 FCBs) over the period 2005-2014 on yearly basis which account for more than 90% of assets and deposits in the banking sector of Bangladesh in 2014. The banks listed in 2012 are excluded for having a very short operation history. The specialized banks, concentrated to meet the special needs and demand for agricultural and industrial development, are also excluded as they are not driven by profit and their ROEs are almost negative for the whole sample period, seeming that they are the outliers. The variables: ROE, CAR, LR, NPL, MQ, NTA and FL are derived from both the income statements and the balance sheets of commercial banks published in the website, as well as from the Bangladesh Bank statements. GDP Growth is taken from World Development Indicators of World Bank.

Before estimation, we perform several transformations on our data. First, all the variables are transformed into their natural logarithm forms. As we have a panel data set, we proceed to estimation using fixed effects and random effects models. In the fixed effects model, the individual-specific effect is a random variable that is allowed to be correlated with the explanatory variables. The rationale behind random effects model is that, unlike the fixed effects model, the individual specific effect is a random variable that is uncorrelated with the independent variables included in the model. Panel least squares estimation output of ROE with explanatory variables is summarized in Table 1. We have used White period standard errors to correct for heteroscedasticity.

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<sup>3</sup> Same observation is observed over time.

**Table 1: Estimating the determinants of ROE**

Dependent Variable: ROE		
Regressors	Coefficient	Robust SE
Constant	0.236	0.456
Capital Adequacy Ratio	-0.087	0.081
Liquidity Risk	-0.083	0.148
Non Performing Loan	-0.929*	0.532
Management Quality	-0.432	1.519
Non Traditional Activities	3.074***	1.091
Foreign Loans	-0.034***	0.011
Economic Growth	0.042	0.122
N	418	
Number of groups	38	
R-squared	0.176	
Prob (F-statistic)	0.000	

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level respectively.

Table 1 shows the estimated parameters and their standard errors obtained from the application of panel least squares model, using ROE as the dependent variable. Non-performing loan is negatively related to ROE at 10% level of significance. This negative relationship shows that the loan defaults have significant negative impact on bank profitability. Non-traditional activities and foreign loans are found to be significantly affecting the profitability of banks at 1% level. As for the other bank-specific variables, namely capital adequacy ratio, liquidity risk, and management quality, they all show no statistically significant impact on bank profitability. Economic growth is not found to have a significant impact on banks' profitability. Fixed effect panel least squares estimation output of ROE with explanatory variables is summarized in Table 2.

**Table 2: Estimating the determinants of ROE**

Dependent Variable: ROE		
Regressors	Coefficient	Robust SE
Constant	0.580**	0.226
Capital Adequacy Ratio	-0.360***	0.047
Liquidity Risk	-0.036	0.044
Non Performing Loan	-0.021	0.248

Management Quality	-0.203	2.388
Non Traditional Activities	1.173	1.840
Foreign Loans	-0.016*	0.009
Economic Growth	-0.065	0.055
N	418	
Number of groups	38	
R-squared	0.423	
Prob (F-statistic)	0.000	

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level respectively.

The capital adequacy ratio now becomes significant at 1 % level while NPL and NTA become insignificant. An increase in capital adequacy ratio curtails bank's ROE as it leaves the bank with fewer funds for interest earning. FL remains significant at 10 % level but with a lower magnitude of the coefficient. To check the random effect we have used Hausman test. The Hausman test achieves a p-value of 1 which simply indicates that there is no evidence that the random effects estimates are invalid. The outputs of cross-section random effects are used here (Table 3). However, almost similar results are attained using period random effects and two way random effects.

**Table 3: Estimating the determinants of ROE**

Regressors	Dependent Variable: ROE	
	Coefficient	Robust SE
Constant	0.270	0.531
Capital Adequacy Ratio	-0.115	0.074
Liquidity Risk	-0.107	0.153
Non Performing Loan	-0.868*	0.515
Management Quality	-0.681	1.461
Non Traditional Activities	3.092***	1.013
Foreign Loans	-0.031***	0.010
Economic Growth	0.033	0.116
N	418	
Number of groups	38	
R-squared	0.146	
Prob (F-statistic)	0.000	

Note: \*, \*\* and \*\*\* indicate statistical significance at the 10%, 5% and 1% level respectively.

The random effect model results are almost similar to the results attained in panel least squares model. Non-performing loan is negatively related to ROE at 10% level of significance. This negative relationship shows that the loan defaults have significant negative impact on bank profitability. Non-traditional activities and foreign loans are found to be significantly affecting the profitability of banks at 1% level. As for the other bank-specific variables, namely capital adequacy ratio, liquidity risk, and management quality, they all show no statistically significant impact on bank profitability. Economic growth is not found to have a significant impact on banks' profitability. Fixed effect panel least squares estimation output of ROE with explanatory variables is summarized in Table 2.

## 5. Conclusions

Our study examines the determinants of the bank profitability in Bangladesh. Using panel data method (random effects model) for 42 commercial banks (4 SCBs, 30 PCBs & 8 FCBs) over the period 2005-2014 on yearly basis, we find that non performing loan, nontraditional activities, capital adequacy ratio and inflation has statistically significant impact on bank profitability. A bank's profitability is extensively dependent on its non performing loan, both ROA and ROE exhibits a decline at 1% level for an increase in nonperforming loan. On the other hand, non interest income of banks increases their ROA and ROE both, indicating that greater diversified banking activity positively influence returns. On the macroeconomic variables, only inflation is found to having positive effect on profitability, as measured by ROA. When inflation rises, return on assets of banks rises. The remaining bank-specific factors and macroeconomic factor do not have statistically significant effect on bank profitability.

## References

- Aburime, T. U. (2008). Determinants of Bank Profitability: Company-Level Evidence from Nigeria. *SSRN Electronic Journal*, 31. doi:10.2139/ssrn.1106825
- Albertazzi, U., & Gambacorta, L. (2009). Bank profitability and the business cycle. *Journal of Financial Stability*, 5, 393-409. doi:10.1016/j.jfs.2008.10.002
- Alper, D., & Anbar, A. (2011). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. *Business & Economics Research Journal*, 2, 139-152. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=13092448&AN=60823676&h=3pyz1k9juwRV8hD6timSTmM0AA9KN0vZXziYTPoLNA3vQsOJZ/awa7yr9nflNl6JAQWO1O/FIjLi2Z94RShImw=&crl=c>
- Athanasoglou, P. P., Delis, M. D., & Staikouras, C. K. (2006). Determinants of bank profitability in the South Eastern European region. *Bank of Greece Working Paper*, 2, 1-31. Retrieved from <http://mpira.ub.uni-muenchen.de/10274/>
- Curak, M., Poposki, K., & Pepur, S. (2012). Profitability Determinants of the Macedonian Banking Sector in Changing Environment. *Procedia - Social and Behavioral Sciences*. doi:10.1016/j.sbspro.2012.05.045
- Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 1-38. doi:10.1093/wber/13.2.379
- Flamini, V., Schumacher, M., & McDonald, M. (2009). *The determinants of commercial bank profitability in Sub-Saharan Africa*. Retrieved from <https://books.google.com/books?hl=en&lr=&id=FAkcFrPE984C&oi=fnd&pg=PA3&dq=The+Determinants+of+Commercial+Bank+Profitability+in+Sub-Saharan+Africa&ots=S7zo6p3M7b&sig=twlyIwuaIrV8Oj15tPs6mu2hE4w>
- Guisse, M. (2012). Financial Performance of the Malaysian Banking Industry: Domestic vs Foreign Banks. Retrieved from <http://i-rep.emu.edu.tr:8080/xmlui/handle/11129/308>
- Javaid, S., & Anwar, J. (2011). Determinants of Bank Profitability in Pakistan: Internal Factor Analysis. *Journal of Yasar ...*, 2, 59-78. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=1305970X&AN=69906931&h=I0Y0rI3WB1G8h2t8xxYdZyGbyQkkjDte6vpZv/IIuBq48ebsM8rsb/qra2zEzWywHinbyyJ/fV7lmZSE7Sf9Ug=&crl=c>
- Karim, B. K., Sami, B. A. M., & Hichem, B. K. (2010). Bank-specific, industry-specific and macroeconomic determinants of African Islamic banks' profitability. *International Journal of Business and Management Science*, 3, 39-56. doi:10.1016/j.intfin.2006.07.001

- Molyneux, P., & Seth, R. (1998). Foreign banks, profits and commercial credit extension in the United States. *Applied Financial Economics*. doi:10.1080/096031098332835
- Munyambonera, E. F. (2013). Determinants of Commercial Bank Profitability in Sub-Saharan Africa. *International Journal of Economics and Finance*, 5, 134-148. doi:10.5539/ijef.v5n9p134
- Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21, 222-237. doi:10.1016/j.ribaf.2006.03.007
- Roman, A., & Danuletiu, A. (2013). An Empirical Analysis of the Determinants of Bank Profitability in Romania. *Annales Universitatis Apulensis Series ....* Retrieved from <http://www.oeconomica.uab.ro/upload/lucrari/1520132/23.pdf>
- Salloum, A., & Hayek, J. (2012). Analysing the Determinants of Commercial Bank Profitability in Lebanon. *International Research Journal of Finance and ...*, 93, 123-135. Retrieved from <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Analysing+the+Determinants+of+Commercial+Bank+Profitability+in+Lebanon#0>
- Sufian, F., & Habibullah, M. S. (2009a). Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. *Frontiers of Economics in China*, 4, 274-291. doi:10.1007/s11459-009-0016-1
- Sufian, F., & Habibullah, M. S. (2009b). Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh. *Journal of Business Economics and Management*. doi:10.3846/1611-1699.2009.10.207-217

## Appendix

### A.1. Determinants of ROA (Panel Least Squares)

Dependent Variable: LROE				
Method: Panel Least Squares				
Date: 08/17/16 Time: 23:11				
Sample: 2004 2014				
Periods included: 11				
Cross -sections included: 38				
Total panel (balanced) observations: 418				
White period standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.236631	0.456207	0.518692	0.6043
LCAR	-0.087747	0.081886	-1.071580	0.2845
LNPL	-0.929389	0.532966	-1.743807	0.0819
LLR	-0.083130	0.148671	-0.559153	0.5764
LMQ	-0.432210	1.519597	-0.284424	0.7762
LNTA	3.074673	1.091309	2.817417	0.0051
LFL	-0.034452	0.011164	-3.086064	0.0022
LGDP_R	0.042281	0.122387	0.345471	0.7299
R-squared	0.176962	Mean dependent var		0.109191
Adjusted R -squared	0.162910	S.D. dependent var		0.251543
S.E. of regression	0.230143	Akaike info criterion		-0.081279
Sum squared resid	21.71597	Schwarz criterion		-0.004045
Log likelihood	24.98731	Hannan -Quinn criter.		-0.050747
F-statistic	12.59349	Durbin -Watson stat		1.184195
Prob(F -statistic)	0.000000			

**A.2. Determinants of ROA (Fixed Effect Model)**

Dependent Variable: LR OE				
Method: Panel Least Squares				
Date: 07/10/17 Time: 22:03				
Sample: 2004 2014				
Periods included: 11				
Cross -sections included: 38				
Total panel (balanced) observations: 418				
White period standard errors & covariance (d.f. corrected)				
WARNING: estimated coefficient covariance matrix is of reduced rank				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.580055	0.226023	2.566350	0.0107
LCAR	-0.360467	0.047388	-7.606738	0.0000
LNPL	-0.021157	0.248550	-0.085123	0.932 2
LLR	-0.036181	0.044262	-0.817422	0.4142
LMQ	-0.203728	2.388855	-0.085283	0.9321
LNTA	1.173622	1.840952	0.637508	0.5242
LFL	-0.016600	0.009754	-1.701977	0.0896
LGDP_R	-0.065507	0.055373	-1.183004	0.2376
Effects Specification				
Cross -section fixed (dummy variables)				
R-squared	0.423094	Mean dependent var	0.109191	
Adjusted R -squared	0.355041	S.D. dependent var	0.251543	
S.E. of regression	0.202012	Akaike info criterion	-0.259569	
Sum squared resid	15.2 2174	Schwarz criterion	0.174873	
Log likelihood	99.24991	Hannan -Quinn criter.	-0.087825	
F-statistic	6.217110	Durbin-Watson stat	1.720432	
Prob(F -statistic)	0.000000			

### A.3. Determinants of ROA (Cross-section Random Effects Model)

Dependent Variable: LROE					
Method: Panel EGLS (Cross -section random effects)					
Date: 08/17/16 Time: 23:14					
Sample: 2004 2014					
Periods included: 11					
Cross -sections included: 38					
Total panel (balanced) observations: 418					
Swamy and Arora estimator of component variances					
White period standard errors & covariance (d.f. corrected)					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	0.270801	0.432766	0.625743	0.5318	
LCAR	-0.115493	0.074895	-1.542069	0.1238	
LNPL	-0.868696	0.515122	-1.686391	0.0925	
LLR	-0.107247	0.153772	-0.697445	0.4859	
LMQ	-0.681074	1.461115	-0.466133	0.6414	
LNTA	3.092303	1.013934	3.049806	0.0024	
LFL	-0.031733	0.010813	-2.934832	0.0035	
LGDP_R	0.033078	0.116674	0.283503	0.7769	
Effects Specification				S.D.	Rho
Cross -section random			0.030585	0.0224	
Idiosyncratic random			0.202012	0.9776	
Weighted Statistics					
R-squared	0.146074	Mean dependent var	0.097579		
Adjusted R -squared	0.131495	S.D. dependent var	0.242442		
S.E. of regression	0.225940	Sum squared resid	20.93009		
F-statistic	10.01932	Durbin -Watson stat	1.223537		
Prob(F -statistic)	0.000000				
Unweighted Statistics					
R-squared	0.174934	Mean dependent var	0.109191		
Sum squared resid	21.76947	Durbin -Watson stat	1.176360		