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Determinants of Profitability- A Case from the State-owned Commercial Banks of Bangladesh

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Abstract
This study is an attempt to investigate the impact of bank-specific and economy-specific determinants on the performance of selected State-owned Commercial Banks (SCB) operating in Bangladesh in terms of their profitability. This study considers three prominent SCBs, six bank specific determinants, two economy-specific determinants collected as secondary data from 2007-2014. Different financial ratios and statistical tools (descriptive statistics, Pearson's correlation & regression analysis) have utilized for verifying the hypotheses. The results showed that SCBs' profitability (Return on Assets) has positive relationships with capital adequacy ratio(CAR), cost of fund ratio (COF), cost to income ratio (CIR), GDP growth ratio (GDPR) and negative relationship with classified loans to total loans ratio(CLTL), bank's size (SIZ) and inflation (INFL). Among them, CAR and GDPR are the significant determinants of their profitability over the study period.
Keywords: Profitability, State-owned commercial Banks, Internal & External determinants.

Introduction

Bank's profitability is of great attention to all related parties of modern economy (Sayeed et. al, 2008). Moreover, profitability has become one of the key determinants to strengthen their financial positions and to face the challenges come from globalization (Almazari, 2014). According to the previous literature, profitability determinants have been divided into internal factors and external factors. Internal factors refer factors, which are affected by bank's management decisions and policy objectives (Staikourous & Wood, 2013). External determinants which may be industry specific or economy specific refer economic and institutional environments where banks operate (Gremi, 2013).

Historically there are substantial amount of researches to focus the determinants of bank's profitability over the globe (Ben, Naceur, & Goaied, 2008; Omran & Naceur, 2011; Bonin et. al, 2005; Bourke, 1989; Pasiouras & Kosmidou, 2007; Zopounidis, Tanna, & Pasiouras, 2009; Hassan & Bashir, 2003; Hawtrey & Liag, 2008; Molyneux et al., 1994; Short, 1979; Smirlock, 1985; Williams, 2003). However, the commercial banks of developing economics have received little attention. In addition, the banking sector of developing countries is more volatile than developed countries (Beck & Rahman, 2006; Sufian & Habibullah, 2009; Uddin & Suzuki, 2011). Bangladesh is considered as one of the fastest growing economy in the world. Banking industry contributes almost by 3.9% in our GDP structure (Economic Review of Bangladesh, 2015). The performance and profitability of banking sector is one of core requirements of Bangladesh's economic development. In this context it should be mentioned that few studies have been undertaken (Saklain, 2012; Dey, 2014; Abdullah et al, 2014; Perara et al, 2013;) to investigate the impacts of bank specific, industry specific and economy specific determinants of bank profitability in Bangladesh. There have been identified two sorts of limitations among the researches. Firstly, most studies are based on five years panel data. However, It is suggested that in multiple regression modeling each variable should be at least 10 counts (Nunally, 1967). Secondly, previous researches avoid the profitability determinants of state-owned commercial banks (SCB) of Bangladesh but stills SCBs have mentionable contribution on banking service penetration and economic development. Therefore, this paper aims at investigating the impact of internal & economy specific determinants of SCBs' profitability namely, Sonali Bank Ltd, Janata Bank Ltd & Agrani Bank Ltd.

The paper is designed as section two presents the banking industry structure of Bangladesh. Section three is about the previous researches & findings, section four about data & methodology and sections five analyzes the empirical findings. At last, section six draws summary conclusion.

Overview of Banking Industry in Bangladesh:

At the beginning of independent Bangladesh, there were only 12 banks with 1130 branches across the country (Saklain, 2012). Present Bangladeshi banking industry consists of six state-owned commercial banks (SCB) including BASIC Bank and Bangladesh Development Bank, two specialized banks (SB), thirty-nine private commercial banks (PCB) and nine foreign commercial banks (FCB). There are also six non-scheduled banks (Economic Review of Bangladesh, 2015). The structure of banking system and share of total deposits and assets because of types of banks are shown in Table 1.

Table 1: Structure of the Banking System in Bangladesh (End of June 2015)

Types of Banks	No. of Banks	Branches			Percentage of Total Assets	Percentage of Total Deposits
		Urban	Rural	Total		
SCBs	6	1357 (34.41%)	2312 (44.89%)	3669 (40.18%)	27.53	25.66
	Average	226	385	612	4.59	4.26
SBs	2	110 (2.79%)	1295 (25.15%)	1405 (15.39%)	3.65	5.3
	Average	55	648	703	1.83	2.65
PCBs	39	2402 (60.90%)	1580 (30.68%)	3982 (43.61%)	63.3	64.05
	Average	62	40	102	1.62	1.64
FCBs	9	75 (1.90%)	0 (0%)	75 (.82%)	5.52	4.99
	Average	8	0	8	0.61	0.55
Total	56	3944 (100%)	5150 (100%)	9131 (100%)	100	100

Note: Banks prepare their balance sheet on calendar year basis, and are obliged to submit their audited balance sheet at the end of every calendar year. That is why banks' performance-related figures are stated in calendar year basis.

Source: Economic Review of Bangladesh, 2015; Fractions are avoided in Average Branch Calculation.

Table 1 shows the present banking industry structure of Bangladesh. Among 56 scheduled banks 6 SCBs holds 34.41% of total urban branch network, 44.89% of rural branch and 40.18% of total branch network. They also have 27.53% of total Assets and 25.66% of total deposits. SBs (Bangladesh Krishi Bank and Rajshahi Krishi Unnoyon Bank) have a percentage of 15.39% of total branch network with 3.65% of total assets and 5.3% of total deposits. PCBs with the highest position of branch networks (43.61%) have 63.30% of total assets and 64.05% of total deposits. FCBs with the least branch composition (.82%) holds 5.52% of total assets and 4.99% of total deposits. On an average SBs have highest level of branch network and SCBs have highest level of total assets and total deposits share.

Literature Review

Mostly profitability determinants of banks have been measured in terms of bank specific factors like capital, deposits, total loans, credit risk, bank size etc. Large number of empirical studies have been undertaken in the field where the related findings are summarized below.

Bank capital is an important determinant of profitability (Perara et. al, 2013). Generally, sound capitalized banks have comparative advantages in funds attraction and thus enhance profitability. The relationship between capital and bank profitability is unpredictable (Sharma & Gounder, 2012). Several studies (Berger 1995; Demirgüc- Kunt & Huizinga, 1999; Hassan & Bashir, 2005; Athanasoglou et al., 2008; Dietrich & Wanzenrid, 2009; Davydenko, 2010; Olweny & Shipho, 2011; Ani et al, 2012; Rao & Lakew, 2012) show a positive relationship between capital and profitability, which is contradictory with other findings (Saona, 2011; Ali et. al, 2011). Capital here is considered in terms of Capital Adequacy Ratio (CAR) and is expected a positive relationship between capital of SCBs and their profitability. **Cost of Fund Ratio** is defined as the composition of different liabilities and the cost associated with the liabilities raising (Hossain & Hossain, 2013). A high cost of fund definitely lowers the profitability. Therefore, a negative relationship is expected over the variables. **Cost to Income ratio** is referred as efficiency ratio (Pasiouras and Kosmidou, 2007). Here operational efficiency is measured as a ratio of interest income and interset expense and specifies how well a bank can manage its assets and liabilities to have more interest income over their interest cost (Dey, 2014). They are supposed to have a positive relationship. **Risk structure** of banks consists of credit risk, market risks and operation risk. Here we mainly concern with credit risk. Credit risk is the ration between non-performing loans to total loans (Rahman et. al, 2014). Several studies found negative relationship between credit risk and profitability (Molyneux and Thornton 1992.; Miller and Noulas 1997). Here a negative relationship is also expected between them. **Loans to deposit ratio** is considered as asset quality measurement ratio (Alper and Anbar, 2011). A higher ratio explains higher level of profitability as it generates higher return (Sohail et. al, 2013). It is an indication of bank's prime income source and banks generally; they have a positive relationship if credit risk is mitigated (Acaravci & Calim, 2013). There is found a positive relationship between between the variables (Sufian, 2009 & Aysana & Pinar, 2008). A positive relationship is also expected in this study. Relationship between **bank size** and profitability is controversial as several studies support distinct level of arguments. Bank size is measured as the natural logarithm of total assets (Almazari, 2014). Previous studies (Goddard, Molyneux and Wilson 2004, Kosmidou 2008, Abdullah et. al, 2014) reveal positive relationship between them, which is contracdictory with the result of other studies (Dietrich and Wanzenried, 2009, Vong and Chan, 2009). Further, negative relationship occurs as bank size becomes empire building by government sponsored funding mainly in developing economics (Perara et. al, 2013). Here the expectation is neutral.

Along with bank specific variables, economiy-specific variables like **GDP growth rate**, inflation are also expecetd to have relationships with bank's profitability. Studies (Pasiouras & Kosmidou, 2007; Demirgüc-Kunt & Huizinga, 1999; Bikker & Hu, 2002; Naceur, 2003; Athanasoglou et al. 2008) found significant positive relationship bewteen GDP growth and bank's profitability. The findings with respect to **inflation** are varied (Rahman et. al, 2015). Studies (Wallich 1980; Li, 2007 and Vong and Chan , 2007) reveal a singificant positive relationship between inflation and profitability whereas few studies (Hussain & Hassan 2005, Abdullah et. al, 2014) don't support so. Most importantly, inflation affects profitability performance of banks based on their response in operating costs with respect to inflation (Revell, 1979). Finally, a postive relalationship between GDP growth rate and profitability is expected but in case of inflation the expectation is neutral.

Methodology

Sampling and Data Collection

This study is originated to investigate the profitability performance of state-owned commercial banks (SCBs) of Bangladesh with respect to bank specific and economy specific determinants. According to Economic Review of Bangladesh (2015), there are six state-owned commercial banks working in Bangladesh economy. Nevertheless, in real sense three banks i.e; Sonali, Agrani & Janata Bank are mainly concerned with commercial banking from government source. Rupali Bank Ltd (Government share- 90.19% & Public share- 9.81%) has been excluded for data heterogenety. BASIC Bank Ltd is mainly a specialized bank for SME development and this institution is changed with huge financial scandals in recent years. On the other hand, Bangladesh Development bank is a recently merged corporation of previous Bangladesh Shilpo Bank (BSB) and Bangladesh Shilpo Rin Sangsta (BSRS). Therefore, for data consistency Rupali Bank, BASIC Bank and Development Bank have been excluded from the sampled banks. This study has used secondary quantitative financial and economic data. Data has been considered for 8 years from the year of 2007 to 2014. Bank specific data have been from annual reports of respective SCBs. Economy specific data have been collected from Economic Review of Bangladesh (2015). Along with these sources, previous literatures, lectures and relevant workings & websites were viewed for secondary data.

Variables Considered

This study verified bank specific and economy specific variables as explanatory type for developing statistical relationship with profitability (ROA) as explained variable of sampled banks. The explanatory variables used in the study have been mentioned below:

Table 2: Explanatory Variables

Variables	Ratio Calculation	Expected Sign
Bank-specific Variables:		
Capital Adequacy Ratio (CAR)	Capital Required/Risk Weighted Assets	+
Cost of Fund Ratio (COF)	Cost of Liabilities/Total Liabilities	-
Loans to Depost Ratio (LDR)	Total Loans / Total Deposits	+
Cost to Income Ratio (CIR)	Interest Cost/Interest Income	-
Credit Risk (CLTA)	NPL Amount/Total Loans	-
Bank Size (SZ)	Natural Log of Total Assets	+/-
Economy-specific Explanatory Variables		
Economic Growth (GDPR)	Yearly GDP Growth (Base=2005)	+
Inflation (INFL)	Yearly Inflation Rate	+/-

Source: Variables selected by the researchers.

Hypotheses Considered

Along with above background, the specific objective of this paper is to find out the impact of bank specific and economy specific determinants of SCBs' profitability in Bangladesh. To cover the objectives following alternative hypotheses have been developed.

H1.1: There is a significant relationship between Bank's Capital and Bank's Profitability of State-owned commercial banks in Bangladesh.

H1.2: There is a significant relationship between Bank's Cost of Fund ratio and Bank's Profitability of State-owned commercial banks in Bangladesh.

H1.3: There is a significant relationship between Bank's Loans to Deposit ratio and Bank's Profitability of State-owned commercial banks in Bangladesh.

H1.4: There is a significant relationship between Bank's Cost to Income Ratio and Bank's Profitability of State-owned commercial banks in Bangladesh.

H1.5: There is a significant relationship between Bank's Credit Risk and Bank's Profitability of State-owned commercial banks in Bangladesh.

H1.5: There is a significant relationship between Bank's Size and Bank's Profitability of State-owned commercial banks in Bangladesh.
H1.7: There is a significant relationship between GDP Growth and Bank's Profitability of State-owned commercial banks in Bangladesh.
H1.8: There is a significant relationship between Inflation and Bank's Profitability of State-owned commercial banks in Bangladesh.

Data Analysis & Test of Hypotheses
For data analysis different arithmetic tools like average, percentage, ratio, natural logarithm calculations and statistical tools like; correlations, descriptive analysis and regression results have been used. Researchers have used MS Office-2010 for arithmetic calculations and SPSS 24 for statistical measurements. The regression model used to verify the hypotheses is as below:

$ROAt = \alpha + \Sigma \alpha i Ai + ebt.$
Where,
ROA = Return on Assets
α = Portion of ROA that is not dependent on explanatory variables.
A*i* = ith explanatory Variables
α*i* = coefficients
e*lt* = stochastic term

Findings & Analysis:
Table-3 presents the summary descriptive statistics analysis of all the variables that have been used in this study. Every variable has been designed with their mean averages, standard deviations, minimum, maximum, skewness and their kurtosis value. Among the variables, ROA and CAR have experienced the greatest level of variability in their structures.

Table 3: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ROA	24	-.0591	.0920	.008796	.0326468	.001	.766	.472	3.135	.918
CAR	24	-.0940	.1380	.083771	.0536557	.003	-2.549	.472	6.425	.918
COF	24	.0000	.1041	.066588	.0248396	.001	-1.480	.472	3.109	.918
LDR	24	.4400	.8718	.666704	.0977721	.010	-.111	.472	.332	.918
CIR	24	.4700	.9600	.684742	.1234585	.015	.286	.472	-.477	.918
CLTL	24	.0524	.4600	.198442	.0981202	.010	.699	.472	.601	.918
SIZ	24	9.8324	13.7479	11.610400	1.4338383	2.056	.330	.472	-1.686	.918
GDPR	24	5.0000	7.1000	6.100000	.6043322	.365	-.213	.472	-.161	.918
INFL	24	6.7800	12.3000	8.456250	1.9739231	3.896	1.083	.472	-.376	.918
Valid N (listwise)	24									

Source: Done by the researchers Using Data of Sampled Banks through SPSS

Table-4 shows the correlation matrix among the considered variables in the study. Independent variable, ROA has positive relationships with CAR (.575), COF (.036), LDR (.111) & GDPR (.227) and negative relationships with CTTL (-.190), SIZ (-.150) & ,INFL (-.131). However, relationship is significant only with CAR. There are also existed strong negative relationships between CTTL & COF (-.389), CIR & LDR (-.362) and SIZ & LDR (-.721).

Table-4: Correlations Matrix

		ROA	CAR	COF	LDR	CIR	CLTL	SIZ	GDPR	INFL
ROA	Pearson Correlation	1	**.575****	.036	.111	.035	-.190	-.151	.227	-.131
	Sig. (1-tailed)		**.002**	.433	.302	.436	.187	.240	.143	.271
CAR	Pearson Correlation		1	-.106	-.100	.114	-.292	-.069	-.252	-.001
	Sig. (1-tailed)			.312	.321	.298	.083	.374	.117	.499
COF	Pearson Correlation			1	-.122	-.215	**-.389***	-.284	-.136	-.264
	Sig. (1-tailed)				.285	.157	**.030**	.089	.263	.106
LDR	Pearson Correlation				1	**-.362***	-.273	**-.721****	.074	.230
	Sig. (1-tailed)					**.041**	.099	**.000**	.366	.140
CIR	Pearson Correlation					1	.242	.189	-.066	-.122
	Sig. (1-tailed)						.127	.188	.380	.285
CLTL	Pearson Correlation						1	.545**	.281	-.082
	Sig. (1-tailed)							.003	.092	.352
SIZ	Pearson Correlation							1	.110	.033
	Sig. (1-tailed)								.304	.439
GDPR	Pearson Correlation								1	.149
	Sig. (1-tailed)									.244
INFL	Pearson Correlation									1
	Sig. (1-tailed)									

**. Correlation is significant at the 0.01 level (1-tailed), *. Correlation is significant at the 0.05 level (1-tailed).
Source: Done by the researchers Using Data of Sampled Banks through SPSS

According to table-5, based on 192 observations the explanatory power of model R square is at .599 with adjusted R square is .386. According to R square value, the regression model describes that almost 60% variations in ROA explained by the considered variables. Durbin-Watson is 1.750 that assumes that there is no first order autocorrelation.

Table-5: Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square	Adjusted R Square	F-Statistics	Sig.	Durbin-Watson
	B	Std. Error	Beta								
(Constant)	-.371	.191		-1.944	.071	.774	.599	.386	2.8072.	.040	1.750
CAR	.451	.115	.742	3.923	.001						
COF	.331	.305	.252	1.083	.296						
LDR	.160	.112	.480	1.424	.175						
CIR	.038	.052	.143	.725	.480						
CLTL	-.029	.078	-.087	-.373	.714						
SIZ	.007	.008	.296	.868	.399						
GDPR	.024	.010	.450	2.538	.023						
INFL	-.004	.003	-.241	-1.308	.211						
a. Dependent Variable: ROA,											

Source: Done by the researchers Using Data of Sampled Banks through SPSS

Regression model specifies that CAR, COF, LDR, CIR, SIZ & GDPR have positive impacts on samples banks' ROA and CLTL & INFL have negative impacts. The model finally accepted the significant positive relationship with CAR and GDPR. Table-5 also presents that F value is significant at 0.05 and variations caused by independent variables is significant.

Table-6: Modified Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square	Adjusted R Square	F-Statistics	Sig.	Durbin-Watson
	B	Std. Error	Beta								
(Constant)	-.157	.057		-2.769	.012	.692	.479	.429	9.637	.001	1.723
CAR	.411	.099	.675	4.147	.000						
GDPR	.021	.009	.397	2.440	.024						
a. Dependent Variable: ROA,											

Source: Done by the researchers Using Data of Sampled Banks through SPSS

With the findings of coefficients shown in table-5, further the model has been modified only considering the significant independent variables where R square is .479 that specifies almost 48% variation in dependent variables caused by capital adequacy ratio (CAR) and GDP growth (GDPR). Model is significant at 5% F value. Therefore, the impact of independent variables is significant.

Conclusion

The objective of this study is to examine the impact of bank specific and economy specific variables on SCB's performance. Return on Assets is taken as yardstick for performance evaluation. Three SCBs, six bank specific and two specific variables for 8 years have been considered for the study. This study concludes that capital adequacy ratio (CAR) and GDP growth (GDPR) have significant impact on SCB's profitability. Further study is recommended with more bank specific, industry specific and economy specific variables to have more appropriate results.

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