Impacts of Capital Structure on Performance of Islamic and Conventional Banks: Evidence from Bangladesh

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***Abstract*: Capital structure of the banking sector has a significant influence on performance measurement. Many studies have investigated the relationship between capital structure and the performance of banks but there is a relative shortage of empirical studies investigating the connection between capital structure and the performance of Islamic and conventional banks particularly from emerging economies. The main purpose of this research is to empirically study the capital structure and the performance of both Islamic and conventional banks in Bangladesh. Panel data of 24 banks (6 Islamic banks out of 8 and 18 conventional banks out of 41 banks) has been taken for the period of 2010 to 2017. Data has been analyzed by using EViews software. T-test has been used to determine the statistical evidence of the differential performance of both groups of bank. Outputs of T-test for the variables include; total debt ratio, short term debt, long term debt and loan to asset ratio indicate the existence of statistically strong significant difference between the capital structure of Islamic and conventional banks. In case of conventional banks, ROA as a performance measure is positively and significantly related to loan to asset and inflation variables. Similarly, evidence has been found that statistically, there is a strong positive association of loan to asset and strong negative connection of GDP on ROE. However, in case of Islamic bank, the outcomes reveal the existence of positive and significant impacts of loan to asset on ROA and ROE.**

***Keywords*: Capital structure, Return on asset, Return on equity, Islamic and conventional bank, Bangladesh**

I. INTRODUCTION

Capital structure refers to the distribution of finance, usually mixture of debt and equity capital. The decision on how firm will raise the fund for the business is subjected to both firm's manager and fund supplier. Inappropriate combination of capital structure has negative impact on the performance of firm. Therefore, to maximize the firm value, the manger has to be careful to choose the blend of debt and equity Siddik et al. (2017). However, combination of capital structure differs from business to business. According to tradeoff theory, usually banks have higher financial leverage due to the nature of the business. The optimal capital structure of firm depends on tradeoff between tax saving advantage due to debt and bankruptcy cost. Usually, the higher the financial leverage the better the performance of banking sector (Chaarani, 2019). In contrast, the pecking order theory (Myers, 1977) suggests that performance level of a firm is not influenced by the capital structure rather each firm has their own favored hierarchy for financial decision. According to this theory, internal source of financing is more preferable when compared to external financing. Moreover, in case of external financing, debt is preferable when compared to equity finance.

In order to contribute to this argument, this research analyzes the influence of capital structure on the performance of both Islamic and conventional banks in Bangladesh. To do that, first, the study presents to ascertain whether there is a significant difference between the capital structure of Islamic and conventional banks. Second, this study analyzed the impact of capital structure on both group of banks performance by applying maximum sample of banks in Bangladesh.

II. LITERATURE REVIEW

Capital structure and its effects on firms has been the center of interest to many researchers. Researchers are particularly keen to understand whether debt usage proportion is relevant or irrelevant to firm's performance. In 1958 Modigliani and Miller forms the basis of capital structure theory under assumptions avoiding real world complexities. According to the theory, it is irrelevant to know how a firm is financed when calculating its value. In reality, when the assumptions are relaxed, firm value is affected by the way firm is financed. This motivates researcher to study factors like agency cost, bankruptcy cost, taxes, and asymmetry information.

Later in 1963, Modigliani and Miller further extend their previous theory and included taxes. It is found that debt financing decreases cost of capital as interest on debt is tax deductible. Two theories related to capital structure are found in literature due to disagreements on Modigliani and Miller theorems are: trade off theory and pecking order theory.

2.1 Trade-off Theory

According to trade-off theory, company should consider achieving optimal capital structure by focusing on cost and benefit that attached to debt. A company can get tax shield advantage if they add some debt in their capital structure, but there is bankruptcy and other costs associated to debt. Many researchers found positive relationship between profitability and debt which is consistent with the trade-off theory. Appiadjei (2014) found direct relationship between profitability and short term debt and positive relationship between profitability and long term debt. Anafo *et al* (2015) found direct relationship between short-term debt and return on assets, return on equity and earnings per share.

2.2 Pecking Order Theory

This theory suggests firms should first seek fund from their internal sources. Second option is to go to the creditors and share issue should be the last option to get the finance. Pecking order theory suggests negative relationship between debt and firms' profitability. Hailu (2015) found negative relationship between debt-to-asset ratio to profitability when he studied the influence of capital structure on conventional Ethiopian banks. Nguyen (2015) tested a negative correlation between leverage variable and firm's performance. Likewise, Goyal (2013), Chechet and Olayiwola (2014) among other researchers who found no relationship between leverage and profitability in their studies.

2.3 pital Structure and Conventional Banks

Berger (1995) found positive correlation between book value of Capital-to-assets ratio and Return on equity. This relationship was vital both statistically and economically. He studied 14,862 conventional banks over the period of 1983-1989. Although panel data was used, simultaneous bias was not controlled. Berger (1995) states that risky banks can reduce bankruptcy cost and lower interest expense if the increase capital in their capital structure.

Another study by Berger and Patti (2002) found an exogenous decrease in equity-to-assets ratio by 1% at the sample mean where an increase in return on equity of 6%. These results are significant both statistically and economically. Berger and Patti (2002) used simultaneous equations approach to test relationship between capital structure and banks' performance, where they used profit efficiency as performance indicator. Averages of variables were used to control simultaneous equation bias. To control individual heterogeneity panel data shall be used in our research.

Study by Eriotis *et al*, (2002) examined debt-to-equity ratio and profitability using panel data. The found debt-to-equity ratio has strong negative effect on firm's profitability.

Hutchison and Cox (2006) investigated effect of capital structure on return on equity for US banks for two periods of 1983-1989 (less regulated period) and 1996-2002 (high regulated period).. They found positive relationship between leverage and return on equity for both the periods.

2.4 Capital Structure and Islamic Banks

Pratomo and Ismail (2006) studied capital structure's effect explicitly on Islamic banks' performance. They took data of 15 Malaysian Islamic bank and found high-leveraged banks reduce agency cost, which is in line with agency hypothesis. This can be explained as; more pressure on managers to be more disciplined in making better investment decision and generate cash flows. Their study is limited to only on Islamic banks; however, this study will examine both Islamic banks and conventional banks. Abdel-Hameed (2003) included banking characteristics to understand profitability and efficiency for eight Middle Eastern Country's Islamic Banks. He observed banks profitability increases as the capital and loan ratio increases. He also found negative impact of taxes on bank performance, positive impact of favorable economic condition. This means capital ratios and loans are vital for Islamic bank's performance. Abdel-Hameed (2003) suggests, there is an opportunity cost to hold reserve as taxes distort Islamic banks' performance. He also added, as Islamic Banks treat deposits as share and nominal values are not fixed, banks can be affected if reserves do not bring any revenue and if holding requirements reduces funding opportunity for banks. Therefore, it can be suggested that, Islamic Banks should be free from any reserve requirements. Haron (2004) used data of 14 Islamic banks to measure the factors that contribute to profitability. He found liquidity, expenditures, investment in Islamic securities and profit sharing are highly correlated with income of banks. He also found current account deposit, reserve, and interest rate also significant for banks profitability. He stated inflation, interest rate has positive and market share, and money supply have negative impact on Islamic Banks' profitability.

Siddik et al, (2017) examined effect of capital structure on bank's performance when they studied on 30 Bangladeshi commercial banks in general. They found inverse relationship between capital structure and bank's return-on-equity, return-on-assets and earnings per share. They suggested as Bangladesh has underdeveloped equity and bond market, banks should put priority on retained earnings instead of debt. However, no recent studies have been conducted to investigate the link capital structure and performance of different categories of banks based on emerging economy. This study attempts to fill this gap. The research aim is to empirically study the capital structure and the performance of both Islamic and conventional banks in Bangladesh over the particular period.

III. METHODOLOGY

To examine the impact of capital structure on both group of banks (Islamic vs Conventional) performance, a sample of six Islamic banks out of eight and eighteen conventional banks out of forty-one banks in Bangladesh has been selected. Banks

with incomplete financial data was excluded. In order to insure reliable and meaningful result, latest data between 2010 to 2017 was chosen. Balance panel data of 192 observations (banks/year) are collected from banks audited annual reports. Eviews software has been used to determine the statistical connection between variables. Ordinary least square (OLS) method was applied and this approach is supported by Chaarani et al. (2019) and Hasan et al. (2014). Moreover, Independent sample T-test tool has been applied to determine the statistical evidence of the differential performance of both groups of bank.

Table 1 shows the category of variables used in this research. In order to measure bank performance as a dependent variable, return on asset (ROA) and return on equity (ROE) has been used. To examine the connection between capital structure decision and the performance of banks, capital structure variables are selected for independent variable. These are Total debt ratio (TDTA), Total debt ratio (SDTA), Long-term debt ratio (LDTA). To isolate the effects of capital structure on banks performance, four control variables were selected – Liquidity (LTA), Size, Economic growth (GDP) and Inflation (INF). Size was measured by natural logarithm of total asset. The idea of selecting variables is supported by Chaarani et al. (2019), Siddik et el (2017) and Hasan et al. (2014).

Table 1: Description of variables

Nature of variable	*Legend*	*Variable*	*Proxy*
Dependent	ROA	Return on assets	Net income/total assets
	ROE	Return on equity	Net income/total equity
Independent	TDTA	Total debt ratio	Total debt/ total assets
	SDTA	Short-term debt ratio	Short-term debt/ total assets
	LDTA	Long-term debt ratio	Long-term debt/ total assets
Control	LTA	Liquidity	Total loans/ total assets
	SIZE	Size	Natural logarithm of total assets
	GDP	Economic growth	Annual GDP rate
	INF	Inflation	Annual Inflation rate

In order to achieve the goal of this research, the following core hypothesis were going to be tested:

H1. **Similarity of capital structure**

H0: Both group of banks (Islamic and Conventional) have Similar capital structure

H1: Both group of banks (Islamic and Conventional) have different capital structure

H2. **Capital structure and performance of banks in BD**

H0: Capital structure has no significant impact on banks performance in Bangladesh (BD)

H1: Capital structure has significant impact on banks performance in Bangladesh

H3. Capital structure and performance of conventional banks in BD

H0: Capital structure does not affect conventional Banks performance in Bangladesh

H1: Capital structure affects conventional Banks performance in Bangladesh

H4. **Capital structure and performance of Islamic banks in BD**

H0: Capital structure does not affect Islamic Banks performance in Bangladesh

H1: Capital structure affects Islamic Banks performance in Bangladesh

Based on the study of Siddik et al. (2017) and Hasan et al. (2014), we adopt an empirical model, where bank performance is represented by BPit, measured by ROA and ROE for bank i in year t, as follows:

$$\mathbf{BPit = \alpha o + \beta i.CSit + \lambda it.Xit + \Theta t.MACROt + \epsilon it \quad (Eq: 1)}$$

Here, **BPit** represents bank i performance in year t (Dependent variables) and CSit reflects the matrix of capital structure variable (Independent variables). Xit reflects the matrix of bank related variables such as Size, Liquidity. MACROt represents matrix of the macroeconomics variable, which is dignified by GDP growth rate, Inflation rate in year t. €it is an error term. If Standard error is very small, show high precision, which indicate regression line is fit for prediction. Based on expected variables.

Since we have two variables, ROA and ROE, we can use equations 2 and 3 for ROA and ROE to measure bank performance based on the expected relationship among variables which is given in equation 1.

$$\mathbf{ROAit} = \alpha o + \beta 1\ TDTAit + \beta 2\ SDTAit + \beta 3\ LDTAit + \lambda 1\ LTAYit + \lambda 2\ SIZEit + \Theta 1 GDPit + \Theta 2\ INFit + \epsilon it \quad \mathbf{(Eq: 2)}$$

$$\mathbf{ROEit} = \alpha o + \beta 1\ TDTAit + \beta 2\ SDTAit + \beta 3\ LDTAit + \lambda 1\ LTAYit + \lambda 2\ SIZEit + \Theta 1 GDPit + \Theta 2\ INFit + \epsilon it \quad \mathbf{(Eq: 3)}$$

IV. EMPIRICAL FINDINGS AND ANALYSIS

The designated variables are described in Table 2. Statistics shows sampled banks earned on average 1.17% of total assets with the maximum value of 3.4%. In case of ROE, the mean value is 13.71% with standard deviation of 5.61%. In contrast, for independent variables – TDTA, SDTA and LDTA means values are 0.9194, 0.4413 and 0.4780 respectively with the standard deviation of 0.0215, 0.1329 and 0.1289. Short term debt (SDTA) is one of the main sources of banks earnings.

The average (mean) result of Short term debt (SDTA) shows 44.13%, with high standard deviation of 13.29%. High the standard deviation of Short term debt indicates the significant deviation of short term earnings of all sampled banks.

Table 2: Descriptive Statistics

Variable	*Obs.*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
ROA	192	.0129	3.4188	1.1658	.5905
ROE	192	.1702	38.8158	13.7112	5.6129
TDTA	192	.8486	.9838	.9194	.0215
SDTA	192	.1060	.7771	.4413	.1329
LDTA	192	.1547	.8113	.4780	.1289
LTA	192	.5004	.8353	.6878	.0559
Size	192	10.8911	13.7097	12.0441	.5069
GDP	192	5.57	7.3000	6.4462	.5352
Inflation	192	5.5100	11.4000	7.2087	1.7985

As we know, usually bank with high LTA (loans to assets ratio) value will have higher net interest income. In this case, LTA of sampled banks has mean value of 68.78% and standard deviations of 5.59%, which shows the existence of reasonable deviation among tested banks. For other control variables- Size, GDP and Inflation, a small level of standard deviation has observed over the study period.

T-test analysis, at 95% confidence interval has been applied to explore the statistical evidence of the differential performance of both groups of bank.

Table 3: T test analysis for 95% confidence level

Variable	*Levene's Test Sig Value*	*Sig. (2-tailed)*	*Results*
Total debt ratio (TDTA)	0.230	0.001**	Statistically significant difference
Short term debt ratio (SDTA)	0.599	0.007**	Statistically significant difference
Long term debt ratio (LDTA)	0.988	0.025*	Statistically significant difference
Liquidity (LTA)	0.108	0.000**	Statistically significant difference

** Significant at 1% level * Significant at 5% level

Results of T test analysis (see table 3) of variables- TDTA, STDA, LDTA and LTA indicates that there is statistically strong significant difference between the capital structure of Islamic and Conventional banks. The results reveal the dissimilarity of capital structure of Islamic and conventional banks in Bangladesh. This result is in a harmony with Jaffar & Manarvi (2011). Therefore, alternative hypothesis H1,1 is approv

To test the hypothesis, ordinary least squared (OLS) regression model has been applied, as shown in table 4. Model clarifies 42.96% of variation in ROA and 34.22% variations in ROE. The result indicates that capital structure variables, named, SDTA and LDTA, have significant negative impact on ROA and the result is consistent with Siddik et al, (2017) and Hasan et al. (2014). Similarly, no significant impact has been found on ROE with all independent variables. Amongst the bank specific control variables, result reveals lower the bank size leads to better performance of banks in terms of ROA and ROE. In case of macroeconomic control variables, we observed that GDP has a significant negative connotation with ROA and ROE.

Table 4: Regression Estimates of all Sample Banks

Variables	***ROA***				***ROE***			
	Coef.	***Std. Error***	***t-stat.***	***Prob.***	***Coef.***	***Std. Error***	***t-stat.***	***Prob.***
TDTA	2.3570	6.7539	0.3489	0.7250	70.2091	68.9132	1.0197	0.3092
SDTA	-11.6840	6.6991	-1.7441	0.0828*	-60.4930	68.3548	-0.8849	0.3773
LDTA	-11.9280	6.6908	-1.7829	0.0763*	-63.0453	68.2698	-0.9235	0.3570
LTA	2.2170	0.5988	3.7034	0.0003 **	28.8656	6.1098	4.7245	0.0000**
SIZE	-0.2440	0.0873	-2.7955	0.0057**	-3.1944	0.8910	-0.3585	0.0004**
INF	0.0293	0.0220	1.3285	0.1857	0.1697	0.2248	0.7553	0.4511
GDP	-0.3043	0.0769	-3.9596	0.0001**	-3.1863	0.7842	-4.0632	0.0001**
Constant	13.0200	1.8039	7.2191	0.0000**	43.8776	18.4057	2.3839	0.0181*
R-squared	0.4296				0.3422			
Adjusted R^2	0.4075				0.3172			
F-Statistics	19.77 (P value = 0.0000)				13.68 (P value= .0000)			

** Significant at 1% level * Significant at 10% level

Findings of the model reject the null hypothesis. Therefore, H2, 1 approved, which means capital structure has significant impact on banks performance in Bangladesh.

Table 4 and 5 show the regression estimates of both group of banks (Islamic and Conventional). As shown in table 5, model explains 39.67% of the variation of ROA and 40.15 % variation of ROE. Interestingly, no significant impact has been found on conventional banks performance with all independent variables. In case of control variables, results show that conventional bank's LTA is positively related with the profitability. Conventional bank size is negatively related with the performance, which means lower the size higher the performance of a bank. Therefore, H3,0 approved, capital structure does not affect conventional banks performance in Bangladesh.

Table 5: Regression Estimates of Conventional Banks

Variables	*ROA*				*ROE*			
	Coef.	***Std. Error***	***t-stat.***	***Prob.***	***Coef.***	***Std. Error***	***t-stat.***	***Prob.***
TDTA	6.1538	7.9956	0.7697	0.4428	82.4652	79.4705	1.0377	0.3013
SDTA	-12.0282	7.8824	-1.5259	0.1293	-35.7131	78.3458	-0.4558	0.6492
LDTA	-12.2250	7.8667	-1.5540	0.1225	-38.3775	78.1885	-0.4908	0.6243
LTA	3.0131	0.8172	3.6869	0.0003**	39.5392	8.1227	4.8678	0.0000**
SIZE	-0.0925	0.1294	-0.7151	0.4758	-2.0177	1.2864	-1.5686	0.1191
INF	0.0457	0.0271	1.6846	0.0944*	0.3701	0.2698	1.3718	0.1724
GDP	-0.4138	0.1000	-4.1349	0.0001**	-4.6717	0.9947	-4.6968	0.0000**
Constant	8.1009	2.6499	3.0570	0.0027**	-2.6419	26.3385	-0.1003	0.9202
R-squared	0.3967				0.4015			
Adjusted R^2	0.3657				0.3707			
F-Statistics	12.78 (P value = 0.0000)				13.04 (p value= 0.0000)			

** Significant at 1% level * Significant at 10% level

Similarly, in case of Islamic banks the results (see table 6) do not reveal any significant impact of TDTA, SDTA and LDTA on bank's profitability in Bangladesh. Amongst the control variables, Islamic banks LTA have significant positive connection with profitability, which refers higher the loan to asset (LTA) better the Islamic bank performance. Output also shows the negative impact of size with Islamic banks profitability. Therefore, H4, 0 approved and alternative hypothesis is rejected.

Table 6: Regression Estimates of Islamic Banks

Variables	*ROA*				*ROE*			
	Coef.	***Std. Error***	***t-stat.***	***Prob.***	***Coef.***	***Std. Error***	***t-stat.***	***Prob.***
TDTA	-11.8332	12.4688	-0.9490	0.3483	16.4729	130.0537	0.1267	0.8998
SDTA	-2.8323	12.3461	-0.2294	0.8197	-55.1413	128.7732	-0.4282	0.6708
LDTA	-3.2320	12.3579	-0.2615	0.7950	-60.2810	128.8965	-0.4677	0.6426
LTA	4.5564	1.4331	3.1793	0.0028**	51.0039	14.9481	3.4121	0.0015**
SIZE	-0.0313	0.1235	-2.4777	0.0175**	-3.6016	1.3186	-2.7315	0.0093**
INF	0.0155	0.0346	0.4489	0.6559	-0.1530	0.3607	-0.4242	0.6737
GDP	-0.2037	0.1185	-1.7194	0.0933*	-1.2149	1.236	-0.9829	0.3316
Constant	16.5167	2.5171	6.5616	0.0000**	66.8499	26.2549	2.5461	0.0148
R-squared	0.6759				0.4432			
Adjusted R^2	0.6192				0.3458			
F-Statistics	11.92 (P value = 0.0000)				4.55 (p value= 0.0008)			

** Significant at 1% level * Significant at 10% level

V. CONCLUSION

Result of the study shows dissimilarity of capital structure of Islamic and conventional banks by considering a sample of 24 banks in Bangladesh. This could be the consequence of different nature of banking practice due to the different principle of banking business. This result is consistent with Jafar & Manarvi (2011) in context of Pakistani banking sector. However, no significant impact has been found on both group of banks (conventional and Islamic) performance with all independent variables. The study finds a statistically significant positive impact for both group of bank's size on its profitability, which indicates higher the bank size, higher the capacity to provide loan and higher the possibility to earn interest income.

This study contributes to the literature by showing the comparative performance analysis of two different category of banks (Islamic and Conventional) rather than only concentrated on banks. This study also reveals that SDTA and LDTA have significant negative impacts on ROA (See table 4) and the result is consistent with Siddik et al, (2017). Therefore, this study suggests financial manger should try to focus on quality of loan (both short and long term) rather than giving high loan to make profit. However, this study suffered by lack of data for all banks in Bangladesh. Future research may be also conducted by concentrating on larger sample and more control variables for a long time span.

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