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Impact of firm characteristics on Capital Structure of Banking Industry of Bangladesh

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Abstract: *This study attempts to investigate the impact of firm characteristics on capital structure of banking industry of Bangladesh where includes 47 banks for the period of 2008 to 2012. This research has been conducted on the basis of secondary information and for conducting smooth analysis data has been collected from different sources such as annual reports, articles and publications etc. We tried to find out whether there is any association between firm characteristics and capital structure of banking industry of Bangladesh and which capital structure theory is applicable for banking industry to take financing decision. Capital Adequacy Ratio (CAR), debt to asset, debt to equity and elements of capital structure are also tried to investigate by using mean, standard deviation, variance and regression analysis by using SPSS software. We selected debt to asset ratio as dependent variable and size, liquidity, tangibility of asset and profitability as independent variables and there are found a negative significant correlation between debt to asset ratio and tangibility of asset that is why Pecking order theory is more applicable and suitable for taking financing decision compare to Trade off theory and Agency cost theory.*

Keywords: *Capital Structure, Debt to Asset Ratio, Debt to Equity Ratio, CAR, Pecking order theory, Trade off theory, Agency cost theory and Banking Industry.*

I. Introduction

Finance is one of the crucial factors to make a business success. For taking financing decision, it is required to consider capital structure of a firm so that financial manager is able to take effective investment decision. Capital structure mainly consists of debt and equity of a firm. The main responsibility of financial manager is to maximize value of firm more specifically maximization of shareholder's wealth by subsiding the cost of funds. So for maximizing the shareholder's wealth, financial manager needs to investigate optimal capital structure to finance.

For choosing the capital structure of a firm, it is required to consider different factors that are related to optimize the profitability and value of a firm. Researchers have given more time both theoretically and practically to find out the new research question. Modigliani and Miller (1958, 1963) have given significant concept for that question. There are many factors of a capital structure have been developed by enormous national and international researchers.

Capital structure is depending on two factors one is company's leverage and other is assets. All firms have to analyze capital structure properly so as to obtain optimal capital structure for a firm for implementing financing decision otherwise firm will face different financial problems, such as bankruptcy and financial distress etc. So the firm which has high leverage, it is necessary to make an efficient capital mixture to minimize cost and maximize net profit that maximizes value of firm. Moreover every firm exists different specific factors that are related to capital structure are needed to consider at the time of choosing optimal capital structure. Many firms would not able to identify the best capital structure for maximizing their profits due to lack proper forecasting regarding to the factors related to capital structure. There are various firms that have different capital structure techniques for optimizing shareholder's wealth, therefore copious research have been conducted on capital structure theories to explain variation of firms capital structure over time, Gul. S. et al, (2012).

Bangladesh is one of the developing countries with a great possibilities and it has an emerging market with a lot of potential possibilities of investment that get an attention for investors of the world and now it's time for mangers to analyze about the influencing factors of using debt and their extent of influence over firms. Although there have been small number of researches emphasizing on the primary determinants of capital structure in Bangladesh such as Chowdhury MU. (2004), Lima M. (2009), and Sayeed M.A. (2011), there is still disagreement regarding the factors that have significant impact in determining a firm's optimal capital structure. The factors affecting optimal capital structure determination of a firm in developed countries may not be equally applicable to a firm in developing countries like Bangladesh. There are some factors yet that have not been considered for analysis that are still important to further use in measuring their impact on capital structure determination and it is require to make a bridge between present study and capital structure theory. So this study

investigates capital structure of banking industry of Bangladesh as to identifying whether is there any association between debt asset ratio and some independent factors to find out proper capital structure theory for the content of banking industry of Bangladesh.

II. Literature Review

The theorem of leverage irrelevance was presented by Modigliani and Miller (1958) that capital structure of a firm does not impact on its value. The work depends on his previous capital structure that has given work of Modigliani & Miller (1958). Modigliani & Miller claim in their first proposition that there is no relationship between capital structure and value of firm rather the assets profitability is responsible for changing firm value. First proposition of the MM is mainly based on assumptions of capital market in which the cost of bankruptcy, transaction cost, information asymmetry and taxes are not present. The second preposition of MM is also based on assumption of perfect capital market that implies that a firm will pay higher return to its shareholders which is using higher D/E ratio due to taking higher risk by shareholders. Modigliani and Miller have got some criticism due to imperfection in capital market. In investment decision of the firm will be used of the various sources of financing may be relevant. The different significant theory likes as pecking order, the theory of agency cost and trade-off theory depend on checking of the concepts of M&M, Gul. S. et al, (2012).

Pecking Order Theory (POT)

In 1961 Donaldson first suggested Pecking order theory and in 1984, it was modified by Stewart C. Myers and Nicolas Majluf. This theory implies that the cost of financing increases with asymmetric information. There are three sources of financing internal funds, debt and new equity. Under POT, when a firm is going to raise capital, firm prefers financing that comes from first internal funds, then debt, and then issuing new equity as a last resort when it is no longer sensible to issue any more debt. Myers and Majluf (1984) popularized the pecking order theory when they argue that equity is a less preferred means to raise capital because when managers (who have better knowledge about the condition of the firm rather than invertors) issue new equity, investors believe that managers think that the firm is overvalued and managers are taking advantage of this over-valuation. As a result, investors will try to place a lower value to the new equity issuance.

Trade-Off Theory (TOT)

The Trade-off theory of capital structure refers to the concept that a firm chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. This theory basically entails offsetting the costs of debt against the benefits of debt. It describes that the firms are generally financed by both equities and debts. Trade-off theory of capital structure primarily deals with the two concepts - cost of financial distress and agency costs. It states that there is an advantage to financing with debt, the tax benefits of debt and there is a cost of financing with debt, the costs of financial distress including bankruptcy costs of debt and non-bankruptcy costs. In 1963 Modigliani and Miller introduced the tax benefit of debt. Modigliani and Miller said the attractiveness of debt decreases with the personal tax on the interest income. A firm experiences financial distress when the firm is not able to conform to the debt holders' obligations.

Agency Cost Theory

Jensen and Meckling (1976) was the first who took initiative to conduct research in this field by continuing the preceding research by Fama and Miller (1972). Myers (2001) indicates that despite maximizing the wealth of shareholders managers might work for their personal incentives. An agency cost theory is an economic concept concerning the cost to a principal when the principal chooses or hires an "agent" to act on its behalf. Because the two parties have different interests and the agent has more information, the principal cannot directly provide any assurance that its agent is always acting in its best interests. There are mainly two main sources of costs, first one is the costs inherently associated with using an agent (e.g., the risk that agents will use organizational resource for their own benefit) and second one is the costs of techniques used to dwindle the problems associated with using an agent—gathering more information on what the agent is doing or employing mechanisms to align the interests of the agent with those of the principal.

Empirical Evidence on Capital Structure Theories

The POT test is given mixed result. POT is supported by Shyam-Sunder and Myers (1999) in their study during the period 1971- 1989 on data taken from companies listed in "Newyork Stock Exchange". However less support is found for POT by Frank and Goyal (2003) during the period 1971 to 1998 of public listed firms in US. Fama and French (2005) also do not find support for POT; they test and analyze the financing decision of many individual companies and they have found that they are opposite of TOT. Abubakar sayeed (2007) during the period 2001-2005 in energy sector of Pakistan find that POT is applicable to energy sector of Pakistan. Jasir ilyas (2008) find that POT is applicable to listed non financial firms in Pakistan. Bradley et al.

(1984) have got mix result in their study on capital structure theories. They found strong direct relationship between firm's debt level and non-debt tax shields which is against POT. In their study on capital structure determinants MacKie-Mason (1990), Givoly et al. (1992) and Trezevent (1992) found of trade-off theory. Shah and Hijazi (2004) find support for trade-off theory and agency cost theory in his study on Pakistani listed non-financial firms during the period 1997 to 2001.Delcoure (2007) did not found enough documents for POT, TOT and agency cost theory and argue that these theories not neutral explain the capital structure puzzle. Fakher Buferna et al. (2008) find that their results suggest that both agency cost theory and TOT are used in the context of Libya while POT do not.

III. Objective of the Study

The main objective of the study is to evaluate impact of firm's characteristics on capital structure of banking industry. This study will attempt to accomplish the following specific objectives:

a) To assess capital structure of banking industry over the period of 2008 to 2012.
b) To compare the elements of capital structure among the state owned commercial banks (SCBs), the state owned development financial institutions (DFIs), the private commercial banks (PCBs), and the foreign commercial banks (FCBs) for the period of 2010 to 2012.
c) To compare Capital Adequacy Ratio (CAR) among SCBs, DFIs, PCBs and FCBs for the period of 2008 to 2012.
d) To determine impact of firm characteristics on capital structure of banking industry.

IV. Methodology of the Study

This section contains the research methodology of the study. This section describes, the sources of sample selection, the selection period of that sample, the sources of data, and technique used for content analysis are as follows:

4.1 Sample Selection

This study mainly based on banking industry of Bangladesh. The banking industry has been divided in the following ways: The state owned commercial banks (SCBs), the state owned development financial institutions (DFIs), the private commercial banks (PCBs), and the foreign commercial banks (FCBs) which have been selected as sample which is given in Appendix – 1.

4.2 Data Collection

There are two sources of data collection for conducting research such as primary source and secondary source. So, data has been collected from secondary sources for this study including annual reports of different banks, journals, research reports and web sides etc.

4.3 Selection Period

For conducting this study 2008 to 2012 have been selected as study period of this research. So, Data has been collected for the period of 2008 to 2012 to make smooth analysis.

4.4 Method Used for the Study

Different methods have been selected to conform to the study such as Capital Structure Ratio i.e. Total Debt to Total Assets and Debt to Equity Ratio, Industry's Total Deposit, Capital and Reserve and Other liabilities for the period of 2008 to 2012, Capital Adequacy Ratio (CAR) etc. To determine the impact of firms characteristics on capital structure of banking industry, in this paper we have used four independent variables such as size, liquidity, tangibility, and profitability as firm specific factors and the dependent variable of the study is debt ratio.

4.4.1 Dependent Variable

4.4.1.1 Debt Ratio

Debt Ratio has been selected as dependent variable of our study. There are enormous definitions of leverage exist in the literature of corporate capital structure, such as total debt or long term debt divided by total assets. Both current liabilities and long term debt are included in total debt.

Low debt ratio is preferable to creditors because the lower the ratio the higher the possibility of reducing creditors losses in the event of liquidation. On the other hand, it is expected to stockholders to have more leverage because it proliferate expected earnings. In Bangladesh majority of firms are smaller in size therefore it is difficult for them to access to capital market, because small firms have technical difficulties and cost, therefore there total debt consist of higher percentage of short term debt according to Shah and Hijazi (2004). So, to measure capital structure, we use the proxy of total debt divided by total assets. We define debt ratio as:

- ✓ Debt ratio (DR *it)* = total debt/total assets.
- ✓ Debt ratio (DR *it)* = total debt/total equity.

4.4.2 Independent Variables

4.4.2.1 Size

Size (SIZE *it*) is one of the independent variables. There are different results between the relationship of size and debt ratio. There is a positive relation between size and debt ratio according to trade-off theory which is studied by Titman and Wessels (1988) and found that there are low chances of bankruptcy of large companies due to their diversification and there is very low probability of their default, so for this reason lenders prefer them to give loans as compare to smaller firms. On the other hand, there is a negative relationship between size and dependent variable according to POT. Similarly there is a positive association of size with debt ratio according to the theory of agency cost. To measure the Size variable, we take the proxy of total assets. We take the natural log of total assets to conduct smooth the variation in the figure over a period of time.

6.6.2.2 Liquidity

Our second independent variable is liquidity (LIQUIDITY *it*). Liquidity is measured by dividing current assets by current liabilities and it is equal to current ratio.

There is a negative association between liquidity and leverage which is predicted by POT due to high liquidity, sufficient cash inflows can be generated by firms and therefore the excess cash inflows can be used to finance investment and operating activities. Again according to trade-off theory, the association of debt ratio with liquidity is positive because short term liabilities can be paid on time by high liquidity firms.

4.4.2.3 Tangibility of Assets

Tangibility (TANGIBILITY *it*) is our third independent variable. There is a positive relationship between tangibility and debt ratio which is predicted by Trade-off theory. There is asymmetric information in today's changing world where the firms which have higher fixed assets can easily attain debt because it is highly acceptable to creditors as a security. The interest rate for those firms which have more fixed assets will be lower because it is possible to them to provide this large amount of fixed assets as a security to creditors. To prevent manager's attitude to consume excessive perks, companies can use higher debt level in different conditions, According to the theory of agency cost. According to Grossman and Hart (1982) the companies which use higher debt ratio can monitor the activities of managers when they have fewer tangible assets even at high cost of debt. It is predicted by the theory of agency cost that there is a positive association of tangibility of assets with dependent variable. It is suggested by POT that companies will face the problem of asymmetric information when they have less amount of fixed assets, therefore more short term debt will be used by such firms with less fixed assets. So we considered the proxy fixed assets divided by total assets is used to measure tangibility variable.

4.4.2.4 Profitability

Our fourth independent variable is profitability (PROFITABILITY *it*). There is a diverse relationship between profitability and debt ratio. According to POT profitable firms will be given first priority to their internal funds as compare to external funds Myer and Majluf (1984); and firms which have a large amount of retained earnings will first finance their investments with retained earnings. High profitable firms will use more debt because of tax benefits of debt according to Trade-off theory of capital structure. The reason is that the firms which are high profitable have an ability to meet debt repayment obligation, and that's why they are seemed to have less bankruptcy risk. To measure profitability, we have taken net income before taxes and divide it by firm's total assets

4.4.3 Techniques used for data analysis

There are different techniques that have been used for analyzing data include average, standard deviation, co-efficient of variation, percentage, and correlation etc**.** SPSS software version 14 was used to analyze the data.

4.4.4 Model Development

In order to assess the association between company attributes and environmental disclosure volume, the following Ordinary Least Square (OLS) regression model is to be fitted to the data:

DR *it*= β_0+ β1 Size *it* + β2 Liquidity *it* + β3 Tangibility *it* + β4 Profitability *it*+ e*it*

Where,

DR *it* = the debt ratio for the company i at period t,

Size *it* = Represent size of the company i at period t,

Tangibility *it* = Represent the ratio of fixed assets /total assets of company i at period t,
Liquidity *it* = Represent current ratio of company i at period t,
Profitability *it*= NI before taxes/ total assets for company i at period t,
β0 = the intercept, eit = the error term.

4.4.5 Research Hypothesis

There are three hypothesis for banking industry on the basis of capital structure theories which are discussed above and their relationship with debt ratio. We have formulated hypothesis first, second and third for POT, TOT and theory of agency cost respectively. We will try to test each of the hypotheses to identify which theory is more perfect and suitable to companies financing decision. We have formulated alternative and null hypothesis as follows:

4.4.5.1 Pecking Order Theory
Hypothesis
1
H1a
Hi: The relationship between dependent variable and tangibility is negative.
Ho: There is no relationship between tangibility and dependent variable.

H1b
Hi: The relationship between profitability and dependent variable is negative. Ho: There is no relationship between profitability and dependent variable.
H1c

Hi: The relationship between liquidity and dependent variable is negative.
Ho: There is no relationship between liquidity and dependent variable.

4.4.5.2 Trade-Off Theory
Hypothesis
2 H2a
Hi: The relationship between tangibility and dependent variable is positive.
Ho: There is no relationship between tangibility and dependent variable.
H2b

Hi: The relationship between size and dependent variable is positive.
Ho: There is no relationship between size and dependent variable.
4.4.5.3 Theory of agency cost
Hypothesis 3
H3a
Hi: The relationship between size and dependent variable is positive.
Ho: There is no relationship between size and dependent variable.

V. Findings and Analysis of the Study

5.1 Analysis of Total Debt to Asset Ratio and Debt to Equity Ratio

There is a comparative analysis of debt to asset and debt to equity ratio of banking industry for the period of 2008 to 2012. The Debt to Asset Ratio measures the percentage of the company's total assets that are financed with debt (Total Liabilities). This ratio basically looks at what debt the company owes, and compares that debt to what assets the company owns. The table 5.1 shows that debt to asset ratio of banking industry in 2008 is 93.75% and in 2012 is 91.81% that is the use of debt in acquiring assets of banking industry are deceasing over the period. We also tried to measure debt to equity ratio of banking industry to identify the soundness of long-term financial policies of the company. It shows the relation between the portion of assets provided by the stockholders and the portion of assets provided by creditors. It is calculated by dividing total liabilities by stockholder's equity. From the table 5.1 it is shown that in debt to equity ratio is decreasing over the period of 2008 to 2012 that is in 2008 debt to equity ratio is 14.99 where in 2012 debt to equity ratio is 11.21 that means the contribution of creditors in capital structure is decreasing in the banking industry. Again, Table 5.2 shows mean, standard deviation, variance, maximum and minimum of debt to asset ratio and debt to equity ratio for five years. Mean of debt to asset ratio and debt to equity ratio are 92.2040 and 12.0680, Std. Deviation is 1.15671 and 2.06470, and variance is 1.338 and 4.263 respectively. The maximum debt to asset ratio for the five periods is 93.75% of the banking industry where maximum debt to equity ratio is 14.99. And the minimum

debt to asset and debt to equity ratio are 91.03% and 10.12 respectively for the period of 2008 to 2012 of banking industry.

Table No. 5.1

	2008	2009	2010	2011	2012
Debt to Asset Ratio	93.75%	93.06%	91.37%	91.03%	91.81%
Debt to Equity Ratio	14.99	13.42	10.60	10.12	11.21 11.21

Sources: Annual report of Bangladesh Bank 2008 to 2012.

Table No. 5.2

		Debt to Asset Ratio	Debt to Equity Ratio
N	Valid	5	5
	Missing	0	0
Mean		92.2040	12.0680
Std. Deviation		1.15671	2.06470
Variance		1.338	4.263
Minimum		91.03	10.12
Maximum		93.75	14.99

Source: Developed by authors using SPSS software.

5.2 Comparative Analysis of Total Deposit, Capital and Reserve, and other liabilities

In this section, we are trying to find out a comparative analysis of elements of capital structure of banking industry. Below table 5.3 shows PCBs have higher total deposit, Capital and Reserve and other liabilities for the period of 20101 to 2012 where DFIs have lowest total deposit, Capital and Reserve and other liabilities for the period of 20101 to 2012. Again, it is seen that the contribution of total deposit in the capital structure of banking industry is higher than the Capital and Reserve and other liabilities of the organizations.

Table No. 5.3 **in billion tk.**

	2010			2011			2012		
	Total Deposit	**Capital and Reserve**	**Other liabilities**	**Total Deposit**	**Capital and Reserve**	**Other liabilities**	**Total Deposit**	**Capital and Reserve**	**Other liabilities**
SCBs	1044.9	54.55	86.01	1235.6	67.02	103.93	1305.02	69.79	112.3
DFIs	183.4	26.73	45.61	214.4	34.21	56.35	243.39	35.87	63.04
PCBs	2266.5	267.32	456.06	2787.5	342.13	563.55	3092.86	358.72	608.67
FCBs	227.1	70.2	126.82	272.2	92.64	159.07	295.93	97.62	193.43

Source: Annual Report of Bangladesh Bank 2011 - 2012.

5.3 Comparative Analysis of Capital Adequacy Ratio

Capital adequacy ratio measures a bank's capital position and is expressed as a ratio of its capital to its assets. Capital adequacy ratios (CAR) are a measure of the amount of a bank's capital expressed as a percentage of its risk weighted credit exposures. Capital adequacy ratio is also known as total capital ratio. There is standard CAR in Bangladesh is 10% which recommend minimum capital adequacy ratios have been developed to ensure banks can absorb a reasonable level of losses before becoming insolvent. It determines the capacity of the bank in terms of meeting the time liabilities and other risks such as credit risk, operational risk, etc. Table 5.4 shows that SCBs have CAR less than 10% in 2008 to 2010 but it has more than 10% CAR in 2011 and 2012. DFIs have negative CAR in 2008, 2010, 2011, and 2012 and positive CAR in 2009 but all are less than required CAR. Again table 5.3 also shows that PCBs and FCBs both have more CAR than what required CAR in 2008 to 2012. It is very clear from this analysis that PCBs and FCBs have maintained minimum capital adequacy ratio to ensure their capabilities to absorb reasonable losses before becoming insolvent. SCBs haven't maintained their CAR from 2008 to 2010 but now they are maintaining minimum CAR to ensure its capabilities to overcome reasonable losses. The condition of DFIs is very miserable that they have never maintained minimum CAR. Table 5.5 shows a comparative analysis of mean, std. deviation, variance, minimum and maximum of CAR of banking industry for five years. FCBs have highest mean, std. deviation and variance that are 22.04%, 4.57% and 20.85% respectively comparing to the others. DFIs have minimum CAR that is -4.20% where FCBs have maximum CAR that is 28.10%.

Table No. 5.4

	2008	2009	2010	2011	2012
SCBs: CAR	6.9%	9.0%	8.9%	11.7%	11.2%
DFIs: CAR	-5.3%	0.4%	-7.3%	-4.5%	-4.3%
PCBs: CAR	11.4%	12.1%	10.1%	11.5%	11.4%
FCBs: CAR	24.0%	28.1%	15.6%	21.0%	21.5%
Required CAR	10%	10%	10%	10%	10%

Source: Bangladesh Bank Annual Report 2011-2012

Table No. 5.5

		SCBs: CAR	DFIs: CAR	PCBs: CAR	FCBs: CAR	Required CAR
N	Valid	5	5	5	5	5
	Missing	0	0	0	0	0
Mean		9.54	-4.20	11.30	22.04	10.00
Std. Deviation		1.94	2.83	0.73	4.57	0.00
Variance		3.77	8.02	0.53	20.85	0.00
Minimum		6.90	-7.30	10.10	15.60	10.00
Maximum		11.70	0.40	12.10	28.10	10.00

Source: Developed by authors using SPSS software.

5.4 Correlation Analysis

Pearson product moment correlation coefficients (r) were computed to justify the correlation between the dependent and independent variables. The following table no.5.7 shows a correlation matrix of all values of r for the independent variable along with the dependent variable. It is found some correlation among some variables. There is found a significant negative correlation between dependent variable with independent variable that is a significant negative correlation between debt to asset ratio and tangibility of asset which is -0.881 at 5% significant level. It implies that debt to asset ratio of banking industry is decreasing with the increase of tangibility of asset ratio. This negative correlation conforms to the prediction of Pecking Order Theory and considering this result under Pecking Order Theory, null hypothesis is rejected and alternative hypothesis is accepted. So, it can be deduced that Pecking Order Theory is applicable and more suitable for financing decision in the banking industry of Bangladesh.

Table No. 5.7: Correlations Matrix

		Debt to Asset Ratio	Size	Liquidity	Tangibility of Asset	Profitability
Debt to Asset Ratio	Pearson Correlation	1.000				
	Sig. (2-tailed)					
	N	5				
Size	Pearson Correlation	-.850	1.000			
	Sig. (2-tailed)	.068				
	N	5	5			
Liquidity	Pearson Correlation	-.383	.676	1.000		
	Sig. (2-tailed)	.525	.210			
	N	5	5	5		
Tangibility of Asset	Pearson Correlation	-.881(*)	.898(*)	.765	1.000	
	Sig. (2-tailed)	.048	.038	.132		
	N	5	5	5	5	
Profitability	Pearson Correlation	-.811	.641	.110	.576	1.000
	Sig. (2-tailed)	.096	.244	.860	.309	
	N	5	5	5	5	5

* Correlation is significant at the 0.05 level (2-tailed).

Source: Developed by authors using SPSS software.

VI. Conclusion

The study concentrates on capital structure of banking industry of Bangladesh and it is tried to find out whether there is any association between debt to asset ratio and characteristics of banks. A significant negative correlation is found between dependent variable debt to asset ratio and independent variable tangibility of asset

ratio by this analysis. Pecking Order Theory is best fitted by considering this result for the financing decision of banking industry of Bangladesh. This study also emphasized on CAR, debt to asset ratio and debt to equity ratio of banking industry of Bangladesh. PCBs and FCBs have CAR only more than required CAR 10% and SCBs and DFIs have CAR less than which is required CAR 10%. Average debt to asset ratio and debt to equity ratio are 92.20 and 12.06 respectively of banking industry. This study will be effective for banking industry of Bangladesh for making financing decision.

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Appendix

Appendix 1

Banking system structure		
Bank Types	**2012 (June)**	
	No. of Banks	**No. of Branches**
SCBs	4	3449
DFIs	4	1417
PCBs	30	3130
FCBs	9	63
Total	**47**	**8059**

Source: Bangladesh Bank Annual Report 2011-2012