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DETERMINANTS OF PROFIT RATE: EXTERNAL OR INTERNAL FACTORS? EVIDENCE FROM BANGLADESH BANKING

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ABSTRACT

This paper examines the relation between the profit rates of 41 private commercial banks and the efficiency hypothesis, structure conduct hypothesis, and internal factor hypothesis in the banking market of Bangladesh. The evidence of this paper supports that bank internal factors such as CRTA, LDEP and ASSET are significant factor. Structure-conduct variable, CR and efficiency variable, MS are found not to be significant for explaining profit rates which reject the validity of both efficiency hypothesis and structure-conduct hypothesis in the banking market in Bangladesh.

Keywords*: Banking market, Concentration, Bank performance, Bangladesh*

JEL Classification: *G21, G20*

1. INTRODUCTION

Bangladesh is a developing economy with its emerging banking sector. Its banking sector is a good field for testing three hypotheses supported by three distinct groups. They are traditional/structure group, efficiency structure group and general group.

The main view and the findings of the traditional (structure) group are that the external factor such as the oligopolistic behavior of market measured by the concentration of firm leads to higher profit rates. The pioneering studies in this group include Bain (1951), Kaufman (1966), Fraser and Rose (1976) and Ware (1972).

The efficient structure group views that it is the efficiency of firm, not concentration, leads to higher profit rates. There are studies which found that it was the efficiency of firm that lead to higher market-share and concentration and that in the effect had an impact on the profit rates[1]. Concentration is the result of superior efficiency of from performance.

The hypothesis of general group focused on heterogenous aspect of bank performance but excluded concentration and efficiency as determinants[2].

All studies undertaken by the traditional and efficiency structure groups that focused on concentration and efficiency like focused on the banking market of developed countries, U.S.A.,

Canada, Australia[3]. None of the two groups studied the banking market structure of the less developed countries (LDC). The study of the relation between concentration and profit rates of commercial bank in the context of the LDC like Bangladesh will be a positive contribution in the literature of banking structure-conduct performance.

Determining the relation between the profit rates and concentration, efficiency and other bank-specific factors has policy implication. "The assumed positive relationship between concentration and profitability affects regulatory decisions regarding mergers and de novo entry" (Smilock, 1985, p. 73). Concentration has social cost. Thus, regulatory authorities require that the petitioning bank or firm for merger should demonstrate public benefits that outweigh the social cost.

The study of relationship between profit rates and the factors that determine profits is pertinent for bank-management and bank investor-customers. It provides an important information for the efficient management of bank.

This paper is structured as follows: Section 2 provides a brief description of past literature. Section 3 describes model and the variables—dependent and independent—of model. Section 4 provides results and conclusion.

2. SURVEY OF LITERATURE

The survey of the past literature of bank performance measured in terms of profit rates and their determining factors can be classified into three groups. The first group consists of those who claims that firm (bank) profit rates depend on the collusive behavior of firm (bank). The founder of this claim is J. S. Bain (1951). According to him, firm's tacit or implicit (overt or covert) collusive behavior increases the concentration of market share; and the increase in concentration increases the profit rates of firms (banks). Thus, there is a monotonic relationship between profit rates and concentration. The view that there is a positive relationship between the profit rates and concentration is upheld by many. The most notables, among the early ones, are Hoggestad and Mingo (1977), Rhodes (1982) and Spellman (1981). Rhodes in his survey of 39 studies found that 30 of these studies lent evidence in support of the structure-conduct-performance (SCP). That is, increased concentration increases profit rates. Gibert (1984) in his survey of 44 banking industry studies reports that 22 out of 44 provided support in favor of SCP, that increase in concentration increases profit rate of banking firm.[4] Pozdena (1986) studied California banking market and found a direct relationship between increased concentration and higher profit rates. Kaufman (1966) examined Iowa banking market and found evidence of SCP. "Market structure variables were found to be consistently significantly related to various measures of bank performance in directions predicted by economic theory". (p. 438). Lloyd-Williams, Molyneux and Thornton (1994) studied Spanish banking and provided evidence in support of SCP relationship.

The second group consists of those who challenge the SCP relationship. According to them, the direct relation between profit rates and concentration is the result of the efficiency of firm. It is the efficiency, not concentration, which determines the profit rates of bank. According to efficiency structure (ES) supporters, there is a positive relation between profit rates and firm (bank) efficiency measured by market share. The most prominent, among the early figures in

this group, are Demsetz (1973, 1974), Peltzman (1977), and Brozen (1982). According to them SCP relationship suffers from many inconsistencies and contradictions. Brozen (1982), Evanoff and Fortier (1988) and Smirlock (1985) find that firm-specific efficiency is a dominant variable that explains the profitability of the U.S. banking industry. Smirlock (985) studied 2,700 U.S. unit banks and found that market share is the important factor, "concentration adds nothing to explaining profit rates". Market share "is positively and significantly related to profitability even after controlling for concentration" (Snirlock (1985), pp. 80-81).

The third group consists of those who, in general, studied the relationship between bank performance and factors determining the bank performances but excluded concentration and bank efficiency factors. The extent of literature is quite large. Meinster and Elyasiani (1988) examined the performance between foreign and domestic owned banks in U.S. They used several ratio measures of performance including the return on assets (ROA) and return on equity (ROE). Their studies found no difference between them. Sabi (1996) examined the comparative performance of foreign vs Spanish bank. Among the measures of performance, he used return on assets (ROA) and return on equity (ROE). Samad (1999) and Samad and Hassan (2001) compared the Malaysian Islamic bank performance measured by ROA and ROE, among other measures. Samad (2004) evaluated the performance of interest free Islamic banks and interest based conventional banks of Bahrain and found that there were differences in some measures. Islamic banks were found to have greater liquidity reserves than conventional banks.

3. MODEL, VARIABLES AND DATA

Following Weiss (1974), Smirlock (1985) and Lloyd-William, Molyneux, and Thornton [LMT] (1994), I have used the following equation for determining factors explaining profit rates:

$$\Pi = a_0 + a_1 CR + a_2 MS + a_3 CRMS\ \Sigma aiZi \qquad (1)$$

Where Π is a measure of profit rate, CR is concentration ratio representing the measure of market concentration, MS is a measure of market share of the firm, MSCR is an interaction term defined as MS multiplied by CR, and Z is a vector of control variables which take account for firm-specific and market-specific characteristics.

The usefulness of equation 1 is straight-forward The structure-conduct-performance (SCP) view can be supported if the coefficient of CR, $a_1 > 0$ and the coefficient of MS, $a_2 = 0$. A coefficient combination of $a_1 > 0$ and $a_2 = 0$ implies that market share does not affect firm's profitability and that profitability is the result of monopoly behavior measured by concentration. On the other hand, efficiency structure hypothesis (ESH) can be supported if $a_1 = 0$ and $a_2 > 0$. A coefficient combination of $a_1 = 0$ and $a_2 > 0$ implies that firms with large market share are more efficient than their rivals and thus earn higher profits, and market concentration does not affect banks profitability. Thus, $a_1 > 0$ and $a_2 = 0$ supports SCP and $a_1 = 0$ and $a_2 > 0$ supports ESH. The relationship between profit rates and other bank specific internal factors depends on the significance of a_i which are related to Z_i.

The following is complete OLS regression equation which is estimated in determining the relationship between profit rates and CR, MS, and other factors in Bangladesh banking industry:

$$\Pi = a_0 + a_1 CR3 + a_2 MS + a_3 CRTA + a_4 LDEP + a_5 ASSET + Ut \quad (2)$$

DEPENDENT VARIABLE

Π is a dependent variable. Π is a measure bank profit rate. Since bank is a multi-product service industry, price of certain individual product or services is not a good measure for bank performance[5]. In a multi-product service industry such as bank, cross subsidization among the products and services is a common practiced rule than exception. Profitability is a consolidated figure. It takes into account of all products and services profits and losses. It overcomes the problem of cross-subsidization. Due to lack of equity data for sufficient number of banks, this paper uses the following measure of profits:

Π_A = ROA. ROA = Total net profits ÷ total assets

INDEPENDENT VARIABLES

There are seven independent variables in this model. They are as follows:

1. CR3 = Three bank market concentration ratio. CR3 is used to measure market structure. This study uses two measures of CR: one CR3A= concentration ratio of the top three banks for assets and the other CR3D= concentration ratio of the top three banks for deposits. Where CR3 = Σ assets (deposits) of top three banks ÷ total assets (deposits) in the market. The sing for $a_{1,}$ coefficient of CR is expected to be positive and significant for SCP hypothesis.
2. MS_i = Market share of ith bank in assets or deposits. A firm specific market share, MS is used to capture firm efficiency. The sing for a_2, coefficient of MS is expected to be positive and significant for ESH.
3. CRTA = Capital and reserve to total assets. Where CRTA= Total capital and reserve ÷ total assets.
4. $LDEP_i$ = Loans to deposit ratio of $bank_i$. LDEP = loans of $bank_i$ ÷ total deposits of $bank_i$
5. ASSETi = ith bank assets.

Since bank profits, ROA and ROE are not independent of risk, this paper uses two variables—CRTA and LDEP—for measuring bank specific risk. The sign for CRTA coefficient, a_3 is expected to be negative. The higher capital and reserve as a percentage of total assets, the lower the risk for a bank and, therefore, lower is the expected rate of profits. Similarly, the higher the amount of loans as a percentage of deposits, the higher is the risk for a bank. To compensate the higher risk, the bank is expected to earn a higher rate returns. Therefore, the sign for LDEP coefficient, a_3 is expected to be positive. $ASSETS_i$ = ith bank assets. Assets measures bank sizes. The asset of each bank is included to take account of differences of performance brought about by bank sizes. The coefficient for ASSETS may show positive or negative sign depending upon the economies of scale.

Heteroscedasticity is a rule rather than the exception in cross-sectional data if small, medium, and large-size firms are sampled together (Gujrati (1995, p. 368). As this study involves large,

medium, and small banks, the problem of heteroscedasticity is more likely to be common. In order to obviate the heteroscedasticity problem, White 's robust procedure is used.

This study includes cross-sectional data for all 41 private commercial banks operating Bangladesh. All relevant data for the period 1999-2001 are obtained from the consolidated balance-sheets and income-statements published by the Ministry of Finance, Peoples Republic of Bangladesh.

4. REGRESSION RESULTS AND CONCLUSIONS[6]

Regression result of pool data for asset and deposit market is reported in Table 1. Regression results of asset market for 1999, 2000, and 2001 are reported in Table 2. Deposit market regression results for 1999, 2000, and 2001 are provided in Table 3.

Table 1
Determinants of Profit in Asset and Deposit Market[1]

Eq	*Category*	*Dependent variable*	*Intercept*	*CR*	*MS*	*CRTA*	*LDEP*	*ASSET*	R^2
1	Asset market pool	ROA	0.006 (0.44) 0.63	-0.10 (-2.04) 0.04		0.08 (15.93) 0.0000	0.005 (1.50) 0.13	0.0000059 (1.05) 0.29	.86
2	Asset market pool	ROA	0.01 (1.38) 0.16		-0.02 (0.06) 0.94	0.08 (15.02) 0.0000	0.0004 (1.39) 0.16	-0.00000003 (-0.01) 0.98	.86
3	Asset market pool	ROA	0.006 (0.44) 0.66	-0.10 (-2.11) 0.03	-0.14 (-0.33) 0.73	0.08 (15.89)	0.005 (1.47) 0.14	0.0000069 (1.63) 0.10	.86
4	Deposit market pool	ROA	0.01 (1.20) 0.23	0.10 (1.20) 0.22		0.08 (15.04) 0.0000	0.004 (1.54) 0.12	-0.00000001 (-1.08) 0.28	.86
5	Deposit market pool	ROA	0.01 (1.25) 0.21		0.09 (0.8) 0.42	0.08 (15.04) 0.0000	0.004 (1.47) 0.14	-0.00000001 (-1.17) 0.24	.86
6	Deposit market pool	ROA	0.0003 (0.27) 0.78	-0.009 (-0.27) 0.78	0.84 (1.29) 0.19	0.08 (15.75) 0.0000	0.005 (1.57) 0.11	-0.00000002 (-1.83) 0.06	.86

1. Value in parenthesis below the coefficients represents the t-value of co-efficients and the value below parenthesis represents p-value associated with the t-value of the coefficient. The results are White heteroskedasticity adjusted.

It appears from eq 1, 2, and 3 in Table 1 that CR (concentration), not MS, is a significant factor in determining the profit rate for the bank of Bangladesh. However the relationship between ROA and CR is negative. It is feasible in oligopolistic market, if there is an entry threat. Banks in a concentrated market tend to earn lower profits by preventing potential entrants (Hannan, 1983). Established firms pay a great deal of attention to possible action of potential and existing firms. The important point is that this negative relationship between profit rate and market concentration rules out the relevance of structure conduct hypothesis.

Market share, MS is not found to be significant in all regression equations which suggest that the efficiency hypothesis is not true the Bangladesh banking market.

Bank internal factors such as CRTA and ASSET) are significant factors for determining profits rate. This is apparent in all eq—1 through 6—in Table 1 that In asset and deposit markets, banks CRTA play a significant role in the profits of Bangladesh private banks.

Bank assets (ASSET) are significant for the profits rates of Bangladesh banks. This is evident in Eq 3 and 6.

Table 2
Determinants of Profit Rate for Bangladesh Banks Assets Market[1]

Eq	*Category*	*Dependent variable*	*Intercept*	*CR*	*MS*	*CRTA*	*LDEP*	*ASSET*	R^2
1	Asset market 1999	ROA	0.01 (2.24) 0.03	-0.20 (-3.16) 0.003		-0.03 (-4.96) 0.0000	0.005 (2.82) 0.008	0.0000004 (0.96) 0.35	.62
2	Asset market 1999	ROA	0.02 (3.82) 0.0005		-0.14 (1.05) 0.29	-0.03 (-1.06) 0.0000	0.004 (2.92) 0.006		.60
3	Asset market 1999	ROA	0.01 (2.24) 0.03	-0.20 (-3.16) 0.003	0.40 (0.94) 0.35	-0.03 (-4.96) 0.0000	0.005 (2.82) 0.008		.62
4	Asset market 2000	ROA	0.005 (0.59) 0.55	-0.31 (-3.67) 0.0008		0.08 (249.6) 0.0000	0.003 (1.59) 0.11	0.000001 (2.22) 0.03	.99
5	Asset market 2000	ROA	0.01 (1.67) 0.10		0.08 (0.33) 0.73	0.08 (289.6) 0.0000	0.002 (144) 0.15		.99
6	Asset market 2000	ROA	0.005 (0.59) 0.55	-0.31 (-3.67) 0.0008	1.11 (2.22) 0.03	0.08 (249.6) 0.0000	0.003 (1.59) 0.11		.99
7	Asset market 2001	ROA	0.01 (0.81) 0.42	-0.02 (-0.51) 0.60		0.28 (2.66) 0.01	-.01 (-.06) 0.29	0.0000003 (0.68) 0.49	.69
8	Asset market 2001	ROA	0.02 (1.62) 0.11		-0.02 (-.02) 0.31	0.27 (2.76) 0.008)	-0.01 (-.23) 0.22		.69
9	Asset market 2001	ROA	0.01 (0.81) 0.42	-0.02 (-0.51) 0.60	0.71 (0.68) 0.49	0.28 (2.66) 0.01	-0.01 (-.01) 0.29		.69

1. Value in parenthesis below the coefficients represents the t-value of co-efficients and the value below parenthesis represents p-value associated with the t-value of the coefficient. The results are White heteroskedasticity adjusted.

Table 2 shows that there are significant relationship between ROA, profit rates and bank internal factors such as CRTA, LEDP, and ASSET.

CRTA is significant for profit rates. The higher the capital as a percentage of total assets (CRTA), the higher the profits if banks engage in more risky loans, otherwise, profit rates (ROA) would be negatively related to CRTA.

LDEP is significant and positively related to profit rates, shown in eq 1 through 3. The higher the amount of loan as a percentage, the higher the risk for a bank and to compensate the higher risk bank must charge rate of returns.

ASSET is significant and positively related to profit rates (in eq 4). Large banks with higher assets undertake risky project and earn higher profit rates.

Although the relationship between ROA and CR is significant, the coefficient of CR is negative which is contrary to the expectation of market structure hypothesis. This rejects the validity of structure conduct hypothesis in the Bangladesh banking market.

All regression results except eq 6 in Table 2 show that there is not significant relationship between ROA and MS which suggest that efficiency hypothesis is not an explanatory factor for profit rates.

Table 3
Determinants of Profit Rate for Bangladesh Banks Deposit Market[1]

Eq	*Category*	*Dependent variable*	*Intercept*	*CR*	*MS*	*CRTA*	*LDEP*	*ASSET*	R^2
1	Deposit market 1999	ROA	0.01 (2.99) 0.005	0.17 (1.58) 0.12		-0.03 (-18.2) 0.0000	0.005 (2.8) 0.008	-0.0000002 (-2.09) 0.04	.62
2	Deposit market 1999	ROA	0.01 (2.84) 0.007		0.08 (0.31) 0.75	-0.03 (17.2) 0.0000	0.004 (2.86) 0.007	-0.0000002 (-3.06) 0.004	.61
3	Deposit market 1999	ROA	0.01 (2.26) 0.03	-0.09 (-2.39) 0.02	0.3 (0.78) 0.43	-0.03 (-15.8) 0.0000	0.005 (2.88) 0.007	-0.0000002 (-4.6) 0.0001	.63
4	Deposit market 2000	ROA	0.01 (1.50) 0.14	0.03 (1.0) 0.32		0.08 (279.7) 0.0000	0.003 (1.4) 0.14	0.00000001 (0.32) 0.72	.99
5	Deposit market 2000	ROA	0.01 (1.64) 0.10		0.03 (0.65) 0.51	0.08 (228.8) 0.0000	0.002 (1.43) 0.16	0.00000004 (0.19) 0.84	.99
6	Deposit market 2000	ROA	0.004 (0.47) 0.63	-0.06 (-1.69) 0.10	1.44 (2.41) 0.02	0.08 (271.5) 0.0000	0.004 (1.69) 0.09	-0.0000001 (-1.74) 0.09	.99
7	Deposit market 2001	ROA	0.01 (1.11) 0.27	0.32 (1.93) 0.06		0.28 (2.73) 0.01	-0.04 (-.12) 0.27	-0.00000001 (-0.97) 0.33	.69
8	Deposit market 2001	ROA	0.01 (0.92) 0.36		0.41 (0.81) 0.41	0.28 (2.70) 0.01	-0.01 (-.13) 0.26	-.00000001 (-1.02) 0.31	.69
9	Deposit market 2001	ROA	0.01 (0.63) 0.52	0.17 (0.83) 0.40	0.47 (0.41) 0.67	0.28 (2.63) 0.01	-0.01 (-.02) 0.32	-.00000001 (-0.96) 0.32	.69

1. Value in parenthesis below the coefficients represents the t-value of co-efficients and the value below parenthesis represents p-value associated with the t-value of the coefficient. The results are White heteroskedasticity adjusted.

All regression equations—eq 1 through eq 9 show that bank internal factors such as CRTA, LDEP, and ASSET are statistically significant. These factors play a significant role in explaining the profit rate in the banking market of Bangladesh.

Banks with higher assets may reduce the risk by engaging in diversified portfolio. Therefore, higher assets are negative related. This is evident in eq 1, eq 2, and eq 3.

LDEP is significant and positively related to profit rates. This is shown in eq 1, eq 2, eq 3, and eq 4. The higher the amount of loan as a percentage, the higher the risk for a bank and to compensate the higher risk bank must charge rate of returns.

CRTA is significant for profit rates. The higher the capital as a percentage of total assets (CRTA), the higher the profits. Because banks engage in more risky loans.

In none of the eq in Table 3 show that MS is a significant factor for explaining the profit rate which rejects the efficiency hypothesis for the Bangladesh banking market. Similarly, CR is not a significant factor positively affecting the profit rate in the commercial banking marker of Bangladesh.

CONCLUSIONS

Regression results reported in Table 1, Table 2, and Table 3 show that CR3 is significantly negatively related to profit rates. This negative relationship rules out the relevance of structure conduct hypothesis in Bangladesh.

Similarly, the regression results show that bank market share is not significantly related to profit rate which suggest that efficiency hypothesis as an explanation is not valid for Bangladesh banking market.

Regression results show that bank internal factors such as capital-reserve as a percentage of total assets (CRTA), loan as a percentage of total deposit (LDEP), bank-specific assets (ASSETi) are significant factors for explaining the profit rate of Bangladesh commercial banks.

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