



COMPETITION AND BANK PERFORMANCE IN BANGLADESH: AN EMPIRICAL STUDY

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Abstract

Starting from 1970s, the adoption of financial deregulation with an objective of intensifying banking sector competition has remained a common phenomenon in both developed and developing countries. Bangladesh has also executed substantial changes in the banking sector under the financial deregulation framework during 1980s and 1990s. In this regard, this paper attempts to assess bank performance, competition, and their relationship empirically by using banking sector data to fill the gap in the existing banking literature. Return on assets is used as a bank performance measure; whereas seven structural measures are employed for assessing competition followed by an application of ordinary least square regression for indentifying its impact. The findings report an improvement of bank performance during the period 1980-2011. On the other hand, the level of competition has been consistently increasing in the banking sector, as pointed out by all structural measures. The regression result shows an evidence of negative relationship between competition and bank performance, and thus, supports the structure conduct performance hypothesis.

Keywords: Bank performance; Competition; Return on assets

1. Introduction

The banking sector, initially in developed countries and later on in developing countries, has experienced a paradigm shift to financial deregulation from financial repression during 1970s and 1980s with an aim of accelerating the competitive level, although there is no consensus in the banking literature in relation to the optimal structure of the banking industry to ensure both performance and stability. Competition is good for improving performance in a static sense (Allen & Gale, 2004), but at the same time market power provides some benefits for maintaining banking sector stability based upon which many countries adopt policies that implicitly or explicitly confine competition (Northcott, 2004). In spite of these conflicting arguments, a significant number of studies have been undertaken in different parts of the world, particularly in the context of developed countries, to deal with the empirical assessment of competition and its impact on the banking sector. According to Atallah and Le (2006, p. 656), no study prior to their own focuses on the explicit evaluation of the relationship between bank performance and banking sector competition from the perspective of developing countries. However, the measurement of competition and the analysis of its impact on bank performance carry significant policy implications for the banking sector regulator of any country irrespective of its stage of development.

Concerning the banking industry of Bangladesh, many changes have undertaken to lessen the degree of concentration after the adoption of financial reform program in 1989 (Debnath, 2004). However, the number of researches conducted so far with regard to competition and bank performance remains highly insignificant. In fact, no attempt has been made so far to address quantitative assessment of competition and to identify its impact on bank performance, and thus, these issues still remain inconclusive to a great extent. In this regard, this study focuses on the empirical assessment of competition and its impact on bank performance in Bangladesh. Keeping this objective in mind, the later part of this paper is organized in the following way. Section two deals with the review of the related literature concerning the two distinct paradigms, namely, structure conduct performance and efficient structure highlighted by the banking literature. Focus is also given to the review of the studies predominantly concentrating on the banking sector of Bangladesh. Section three provides a brief overview of the banking sector of Bangladesh. Section four highlights the data and methodology adopted for computing bank performance and competition and for assessing the impact of competition. Section five represents the empirical findings and corresponding analyses, and section six concludes the paper.

2. Literature Review

Performance and stability are considered as two vital ingredients by policy makers for the banking sector of a country (Northcott, 2004), and maintaining an optimal industrial structure is essential for enhancing both elements (Berger, 1995). However, the banking literature remains divided over the conflicts arising out of structure conduct performance (SCP) paradigm, also known as structure performance paradigm, and efficient structure (ES) paradigm. The SCP hypothesis, which, according to Park (2009, p. 654) and Seelanatha (2010, p. 21), dates back to Mason (1939), is the oldest and traditional hypothesis. It states that the performance of banks largely depends upon the structure of the market such as the number of banks and the market shares of banks, and the profitability of banks decreases with the increase of competition. In other words, the higher the concentration ratio the higher will be the profitability of banks, reflecting a positive association between market share of a bank and its performance. This is because, the SCP hypothesis is highly governed by the traditional neoclassical theory on the ground that due to collusive or monopolistic reason banks, irrespective of their efficiencies, in a concentrated market are always in a position to charge prices above the marginal costs in order to increase profits. For example, various regulatory restrictions including ceilings on deposit and lending rates and entry barriers facilitate collusive behavior of banks even in a low concentrated market (Lloyd-Williams, Molyneux, & Thornton, 1994). Therefore, the SCP paradigm stresses on the importance of increased concentration with a view to reducing competitive behavior of banks (Bikker & Haaf, 2002), and many scholars express their views in favor of concentrated market structure. For instance, Hellmann, Murdock, and Stiglitz (1997) point out the importance of concentrated market by arguing that competition creates disinclination towards the achievement of optimal scale. Similarly, Beck, Demirguc-Kunt, and Levine (2006) and Boyd, Nicolo, and Smith (2004) find that financial or banking crisis is less likely to occur in a concentrated market.

In contrast, many scholars argue in favor of the competitive market structure. Calem and Carlino (1991) point out that a market with higher concentration is more vulnerable to crisis, and thereby, is less competent and equitable. Berger, Demirguc-Kunt, Levine, and Haubrich (2004) also mention that government intention to restrict competition through foreign bank entry regulation and state ownership of banks generates adverse effects and ultimate poor economic efficiency in a country. Furthermore, it is highly likely that banks in a concentrated atmosphere can engage in non-competitive deeds to generate high revenues with lower benefits for consumers (Abbasoglu, Aysan, & Gunes, 2007; Wong, Fong, Wong, & Choi,

2008), and thus, produce monopoly and corresponding inefficiencies (Suzuki, Miah, & Yuan, 2008). Importantly, arguments highlighting the possible benefits of competitive market actually emerge from the application of the standard industrial organization economics to the financial sector, particularly the banking sector. These arguments, however, show their inclinations towards the alternative hypothesis of the SCP, that is, the ES which states that enhanced performance of banks leads to higher market share, which, in turn, results into market concentration associated with superior efficiency. That is, bank-specific efficiency difference in a particular market leads to uneven proportion of market size and corresponding high intensity of concentration. In fact, this hypothesis does not consider market concentration as a random event; instead it is the result of greater efficiency of the dominant banks (Smirlock, 1985).

With regard to the existing literature on the banking sector of Bangladesh, Perera, Skully, and Wickramanayake (2006) use the data of 26 banks with a sample period from 1995-2003 and adopt the Panzar-Rosse algorithm for assessing the nature of competition of the banking sector of Bangladesh while making a comparative study among South Asian countries. Their focus is more on revenue behavior rather than on the structural change of the banking sector and its impact on bank performance. Furthermore, many changes with regard to financial reform were promulgated even during this period, which require some more time to show the real effect, and as such, a study focusing on recent time period will give a clearer picture. Samad (2008) only uses three-bank concentration ratio as one of the dependent variable in the ordinary least squares regression while testing the validity of the SCP and ES paradigms during the period 1999-2001. His focus is not on the structural change of the banking sector over time rather on the impact of structural change on bank performance. Moreover, three-bank concentration ratio does not always give the actual scenario of the market when used as a single predictor due to its inherent limitations. Thus, the present study helps to fill the gap in the existing banking literature in Bangladesh.

3. Overview of the Banking Sector of Bangladesh

In spite of the existence of different forms of financial institutions and intermediation, the banking sector dominates the process of channelization of funds in Bangladesh. The size of banking sector assets relative to gross domestic product (GDP) was 69.76 percent in 2010 compared to the size of market capitalization of the stock market relative to GDP of 32.79 percent and the size of non-banking sector assets relative to GDP of 5.98 percent (Bangladesh Bank, 2011; Uddin & Gupta, 2012). According to Bangladesh Bank* (2011), the banking sector of Bangladesh comprises of 47 scheduled banks out of which 4 are state-owned banks, 4 are state-owned development financial institutions, 30 are private banks, and 9 are foreign banks. Private banks are sub-divided into denationalized banks, Islamic banks, and non-Islamic banks. At present there are 2 denationalized banks, 7 full-fledged Islamic banks, and 21 non-Islamic banks. The adoption of financial deregulation policies for accelerating the number banks and branches under private and foreign ownerships results into a shift of market share from state-owned scheduled banks to private and foreign banks. For instance, in 1976, state-owned scheduled banks controlled 94.5 percent of the deposits whereas by the end of 2011 the share becomes 32.1 percent[†]. In contrast, the shares of private and foreign banks are in an increasing trend. To be specific, the share of private banks has increased from 3.6 percent in 1983[‡] to 61.6 percent in 2011 and the share of foreign banks has increased by 14.5 percent between 1976 and 2011. Similar changes can also be observed in the credit market.

* Bangladesh Bank is the central bank of the country.

[†] The data are reported in different Oct.-Dec. Issues of Scheduled Bank Statistics, a quarterly publication of Bangladesh Bank.

[‡] Denationalized banks and domestic private banks have been available in the banking market since 1983.

Table 1 represents the composition of different types of banks of the banking sector by the end of 2011. According to the table, private banks dominate the market in respect of both deposits and credits. To be specific, the market share of private banks in terms of deposits and credits is 61.6 percent and 66.6 percent, respectively; whereas state-owned banks and development financial institutions collectively hold 32.1 percent of deposits and 27.8 percent of credits. On the other hand, foreign banks control 6.3 percent and 5.6 percent of banking sector deposits and credits, respectively. Private banks also account for 60.0 percent of the banking sector assets compared to 34.0 percent of state-owned scheduled banks and 6.0 percent of foreign banks. Moreover, private banks maintain 94.1 percent of the banking sector automated teller machines (ATMs). However, in aggregate, state-owned scheduled banks hold the majority of the branch network by maintaining 60.8 percent of the total number of branches, out of which state-owned banks account for 43.2 percent and development financial institutions retain 17.7 percent.

Table 1: Composition of Different Types of Banks of the Banking Sector in 2011

| Types of Banks | No. of Banks | No. of Branches | No. of ATMs | Deposits | | Credits | | Assets | |
|----------------|--------------|-----------------|-------------|----------|------|---------|------|---------|------|
| | | | | Amount | % | Amount | % | Amount | % |
| SCB | 4 | 3437 | 52 | 1214.30 | 27.3 | 747.60 | 21.3 | 1660.76 | 28.0 |
| DFI | 4 | 1406 | 5 | 213.00 | 4.8 | 229.30 | 6.5 | 326.47 | 6.0 |
| PCB | 30 | 3055 | 3386 | 2746.10 | 61.6 | 2332.70 | 66.6 | 3556.80 | 60.0 |
| FCB | 9 | 63 | 155 | 278.60 | 6.3 | 195.50 | 5.6 | 379.47 | 6.0 |
| DB | 2 | 590 | 5 | 192.07 | 4.3 | 148.54 | 4.2 | 254.47 | 4.0 |
| IB | 7 | 655 | 155 | 742.01 | 16.7 | 681.63 | 19.4 | 950.84 | 16.0 |
| NIPB | 21 | 1810 | 3226 | 1812.02 | 40.6 | 1502.53 | 43.0 | 2351.49 | 40.0 |

Source: Constructed by the Author based on Oct.-Dec. issue 2011 of Scheduled Bank Statistics, a quarterly publication of Bangladesh Bank. Few of the data are collected from the Statistics Department of Bangladesh Bank

Notes: SCB, DFI, PCB, FCB, DB, IB, and NIPB respectively stand for state-owned commercial banks, development financial institutions, private commercial banks, foreign commercial banks, denationalized banks, Islamic banks, and non-Islamic private banks. Amounts are in BDT[§] billion.

4. Data and Methodology

4.1 Measurement of Bank Performance

In order to measure bank performance, traditional measure return on assets (ROA) is used in this study. The yearly ROA figures during the period 1980-2011 represent the banking sector performance as a whole. It is considered as a major indicator by investors, managers, and business analysts for appraising the performance of a bank on the whole (Avkiran, 1999). This is because, it indicates the managerial capability of a bank to generate revenue by utilizing its resources, and thus, any change in ROA over time provides necessary evidence for judging the increase or decrease of performance (Neal, 2004, p. 180). Fraser and Fraser (1990) also urge for assessing bank performance from profitability point of a view and regard ROA as an important tool for doing so.

4.2 Competition Measurement Techniques

On the other hand, this study uses structural competition measures, namely, the k-bank concentration ratios (one-bank, three-bank, five-bank, and seven-bank), the Herfindahl-Hirschman index (HHI), the Hall-

[§] BDT stands for Bangladesh Taka, and Taka is the local currency of Bangladesh.

Tideman Index (HTI), and the Comprehensive Industrial Concentration (CCI) with a sample period of 29 years from 1983-2011 to measure the level of competition. Generally, structural measures link competition to concentration. It means that the lower the level of concentration in the banking sector, the higher will be the competition. The competition is calculated by using the loan figures and all the banks operating in a year are considered for the computation. The data are collected from different issues of the “Bank O Arthik Pratisthansamuhar Karjaboli”, which is in Bengali language (the English transformation of the publication is “Bank and Financial Institutions’ Activities”) and published by the Ministry of Finance of the Government of the People’s Republic of Bangladesh. The following table provides a comparative summary of the competition measures adopted in this study:

Table 2: Comparative Analysis of the different Structural Measures of Competition

| Name of the measure | Focus of the measure | Mathematical form | Range |
|-----------------------------|--|---|------------------------|
| K-bank concentration ratios | The market share of the k largest bank (s) depending upon the arbitrary selection process. | $CR_k = \sum_{i=1}^k s_i$ | Zero and 1 |
| HHI | The market share of all banks in an industry. | $HHI = \sum_{i=1}^n s_i^2$ | 1/n and 1 |
| HTI | Assign more focus on number of banks in an industry. | $HTI = 1 / \left(2 \sum_{i=1}^n i s_i - 1 \right)$ | Zero and 1 |
| CCI | Accommodate both absolute and relative concentration with equal importance. | $CCI = s_1 + \sum_{i=2}^n s_i^2 (1 + (1 - s_i))$ | Decimal fraction and 1 |

Source: Constructed by the Author based on Bikker and Haaf (2002).

4.3 Competition and ROA

In order to assess the impact of all of the competition measures adopted in this study on ROA, the following regression equation will be executed seven times by using each of the competition measures computed on the basis of loan figures as independent variable in each case and by remaining the dependent variable and other independent variables unchanged:

$$ROA_t = \alpha_0 + \beta_1 COMP_t + GDPG_t + BRANCH_t + \varepsilon_t$$

where, ROA represents the return on assets of the banking sector as a whole, COMP stands for competition, GDPG means the growth rate of GDP at current market price (computed by dividing the difference of current year’s GDP and previous year’s GDP by the GDP of the previous year), and BRANCH stands for total number of branches of the banking sector per million of people, α denotes the intercept, β represents the regression coefficients, t denotes time, and ε represents the disturbance term. In order to know about the impact of the macroeconomic environment on bank performance, GDPG is introduced in the regression equations. In addition, BRANCH is incorporated to observe the impact of the outreach of cliental-base of the banking sector.

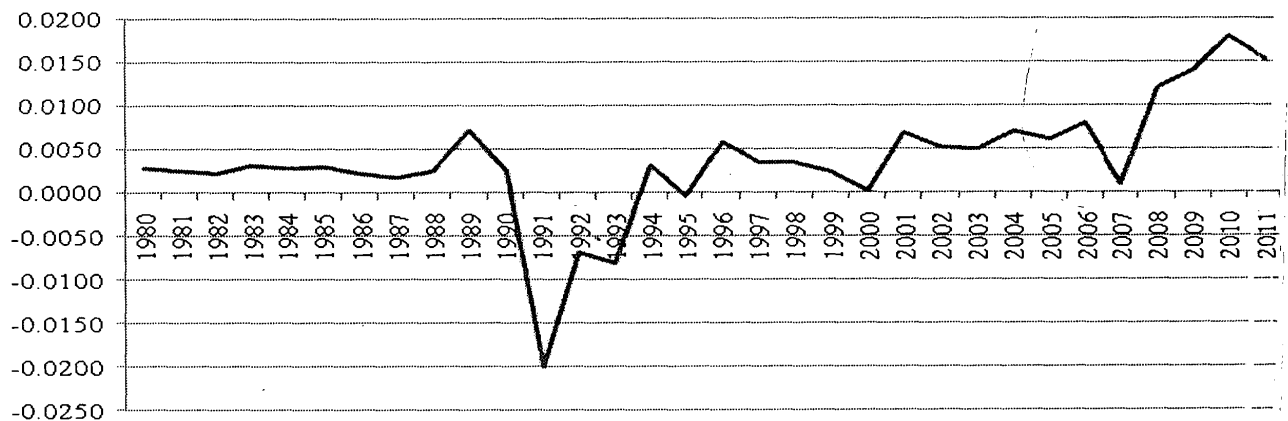
The sample period used for assessing the relationship between competition and ROA is 1983-2011. The data relating to ROA are collected from different annual reports of Bangladesh Bank. On the other hand, the data relating to GDPG and BRANCH are collected from different December issues of economic trends, a monthly publication of Bangladesh Bank.

5. Empirical Findings

5.1 Changes in Bank Performance

Figure 1 portrays the trend of the banking sector ROA during 1980-2011. It shows that prior to financial deregulation, that is, prior to 1990; the ROA of the sector was low but stable in nature. Immediately after the declaration of financial reform program in late 1980, the ROA was drastically reduced, and during 1991-1993, the ROA was negative. Although it showed a slight improvement in the year 1994 and onward, but from time to time, the ROA of the sector has become either negative or close to zero. To be specific, the ROA of the year 1995 was negative and that of the year 2000 and 2007 were close to zero. However, after 2007, the ROA has started to increase by showing a rate of more than 1.00 percent, which was for the first time in the banking history of Bangladesh, and reached to the highest rate, that is, 1.80 percent in the year 2010. It has again shown a declining trend in the year 2011.

Figure 1, ROA of the Banking Sector during the period 1980-2011



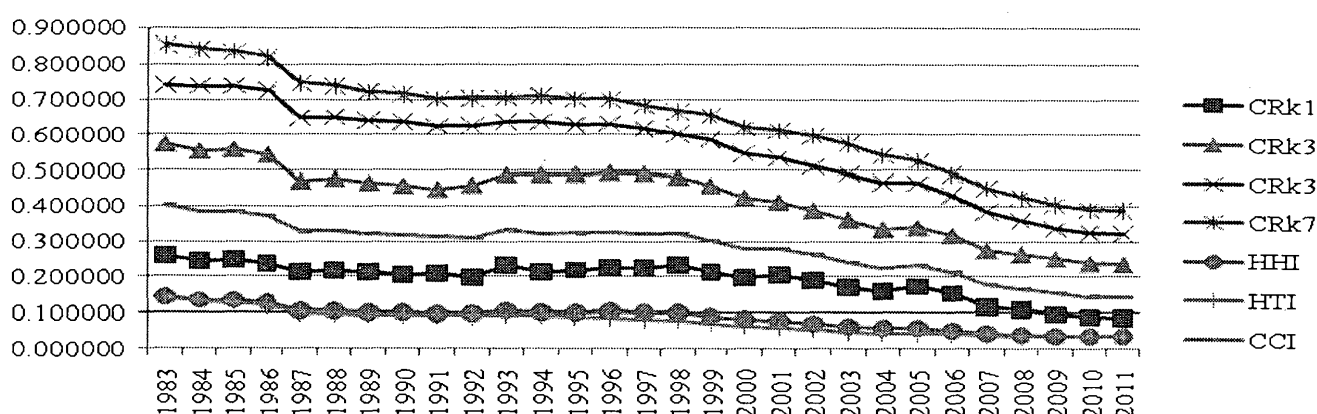
Source: Constructed by the Author based on different annual reports of Bangladesh Bank.

5.2 Changes in Competition Level

Figure 2 represents various competition ratios calculated on the basis of loan figures during the period 1983-2011. It is clear from the graphs that the calculated values of competition not only vary across ratios but also differ within a particular ratio. The one-bank ratio indicates the market share of the leading bank, which was a state-owned bank until 2009. Its share has reduced to 9.6 percent in 2009 from 26.0 percent in 1983. However, in 2010, one of the private Islamic banks took the leading position by capturing 8.8 percent of the total market share, although the share has reduced to 8.6 percent in 2011. Similarly, three, five, and seven bank ratios have reduced by 58.46 percent, 56.35 percent, and 54.39 percent, respectively, in 2011 compared to 1983. In aggregate, it is evident that all of these ratios have reduced by more than 54.0 percent between 1983 and 2011. It means that the level of banking sector concentration has declined substantially, in other words, banking sector competition has intensified during the period under study in spite of the fact that top three, five, and seven largest banks still collectively maintain 23.8 percent, 32.3 percent, and 39.0 percent, respectively, of the total credit market share.

Similar results are also depicted by other structural measures adopted in this study. Starting with the HHI, it can be observed that it has reduced to 0.038 in 2011 from 0.145 in 1983. Linking this ratio with the horizontal merger guideline of the US Department of Justice, it can be concluded that the banking sector of Bangladesh has shifted to a very low concentrated market from a moderately concentrated market. As a matter of fact, the HHI index in 1983 was 1450 (computed as $0.145 \times 10,000$), but by the end of 2011 the index becomes 380 (computed as $0.038 \times 10,000$). According to the horizontal merger guideline, if the index is less than 1000; the market can be regarded as a very low concentrated market; if the index is between 1000 and 1800, the market can be treated as a moderately concentrated market; and if the index is more than 1800, the market can be considered as a highly concentrated market. Likewise, the HTI has reduced to 0.037 in 2011 from 0.143 in 1983, and the CCI has reduced to 0.145 in 2011 from 0.403 in 1983.

Figure 2, Changes in the Competition Ratios calculated on the basis of Loans



Source: Constructed by the Author based on the calculation.

5.3 The Relationship between Competition and ROA

Table 3 accumulates the descriptive statistics of the variables used for measuring the relationship between competition and ROA. According to the table, the average HHI score is 0.0881 during the period 1983-2011 with a maximum and minimum value of 0.1446 and 0.0376, respectively. The maximum and minimum values of the HTI, CCI, one-bank, three-bank, five-bank, and seven-bank ratios indicate the degree of changes of the level of competition in the banking sector during the period under study. On average, the GDP has grown by 4.97 percent reaching to a maximum rate of 6.67 percent and a minimum rate of 2.16 percent. The lowest number of branches per million of million is 44.94 and the highest number of branches is 54.56, and thus, indicate an increase of 21.41 percent during the period 1983-2011. The ROA figures are transformed by using the Van Der Waerden's Formula to remove the normality problem. According to the transformation technique, ranking are created by using the normal scores. The formula used for the transformation is $r / (w + 1)$, where w is the sum of the case weight and r is the rank. Alkdai and Hanefah (2012) also use similar technique for the transformation.

The summary of regression results of different models for measuring the impact of competition on ROA are displayed at table 4. The results are adjusted for autocorrelation problem. However, there is no multicollinearity problem among the independent variables to significantly influence the relationship between dependent and independent variables. According to table 4, the HHI has a negative impact on ROA, which is significant at 1 percent level. Similar to the HHI, all other measures, namely, the one-bank, three-bank, five-bank, seven-bank, HTI, and CCI also negatively influence the ROA of the banking sector. In

all cases, the negative relationship is significant at 1 percent level. The F-statistic indicates the significance of each model at either 1 percent level or 5 percent level.

Table 3: Descriptive Statistics of the Dependent and Independent Variables used in the Regressions for assessing the Relationship between Competition and ROA

| Variables | N | Minimum | Maximum | Mean | Std. Deviation |
|------------------|----|---------|---------|---------|----------------|
| ROA ^T | 29 | 0.0023 | 0.0667 | 0.0344 | 0.0196 |
| CRk ₁ | 29 | 0.0863 | 0.2605 | 0.1917 | 0.0500 |
| CRk ₃ | 29 | 0.2382 | 0.5733 | 0.4222 | 0.1005 |
| CRk ₅ | 29 | 0.3229 | 0.7401 | 0.5609 | 0.1278 |
| CRk ₇ | 29 | 0.3896 | 0.8549 | 0.6390 | 0.1378 |
| HHI | 29 | 0.0376 | 0.1446 | 0.0881 | 0.0311 |
| HTI | 29 | 0.0370 | 0.1434 | 0.0776 | 0.0315 |
| CCI | 29 | 0.1451 | 0.4033 | 0.2849 | 0.0744 |
| GDPG | 29 | 0.0216 | 0.0666 | 0.0497 | 0.0119 |
| BRANCH | 29 | 44.9400 | 54.5600 | 49.7717 | 3.1825 |

Source: Author's Calculation.

Table 4: Summary of the Empirical Results of the Relationships between Competition Measures and ROA

| Model | β | Std. Error | t | F-Statistic |
|------------------|------------|------------|-------|-------------|
| CRk ₁ | -0.260 *** | 0.096 | -2.71 | 3.45 ** |
| CRk ₃ | -0.138 *** | 0.049 | -2.84 | 3.69 ** |
| CRk ₅ | -0.119 *** | 0.038 | -3.12 | 4.15 *** |
| CRk ₇ | -0.114 *** | 0.038 | -3.02 | 4.08 *** |
| HHI | -0.488 *** | 0.174 | -2.80 | 3.71 ** |
| HTI | -0.597 *** | 0.202 | -2.95 | 4.10 *** |
| CCI | -0.196 *** | 0.067 | -2.92 | 3.85 ** |

Source: Author's Calculation.

Notes: The results are obtained after making proper adjustment for auto-correlation problem. The Symbols (***) and (**) represent statistical significance at 1 % and 5% level, respectively.

6. Conclusion and Recommendation

This study aimed at investigating the impact of banking sector competition on bank performance to fill the gap in the existing banking literature of Bangladesh. Based on the empirical evidences it can be concluded that competition negatively influences the performance of banks. The findings of this study prove that banking sector competition to a certain level helps to accelerate the performance of banks, but the severity in competition influences it in a negative way. The degree of accelerated competition and the continuous reduction of bank spread margin under severe price competition among banks and high rate on inflation result into such negative impact on performance. Moreover, it is also highly likely that non-price competition in the form of branch expansion and advertisement, as suggested by Hellmann, Murdock, and Stiglitz (2000, p. 157), also exists in the banking sector of Bangladesh. Although such non-price competition may favorably affect the financial deepening of a country like Bangladesh where financial sector is mostly underdeveloped in nature, but due to the absence of deposit rate control the gains from financial deepening are less than the inefficiencies created by the non-price competition by assuring inferior substitutes for customers and by eroding the franchise value of banks, particularly private banks. Therefore, the regulatory

authority needs to revisit the structural changes to ensure a safe and sound banking structure with necessary incentive for banks to improve their performances.

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