

Commercial Banks' Investment in Capital Market and Its Impact on Private Sector Credit

KAZI IQBAL¹
MIR ARIFUL ISLAM

The period 2007-2010 is marked by boom and bust in the stock market, greater capital market investment by banks, higher profits of the banking sector and fall in growth of credit to the private sector in Bangladesh. In this backdrop, using bank level data for the period 1990-2009, the study examines the impact of banks' greater investment in capital market on the expansion of private sector credit. Descriptive statistics shows that medium sized banks have much higher investment in capital market than the small and large banks. The investment in capital market is also higher for the 2nd generation banks and banks with merchant banks and brokerage houses. Both OLS and fixed effect results provide strong indication that banks' greater investment in the capital market crowded out private investment during 2000-2009. The results show that 1 per cent increase in banks' capital market investment is associated with 0.006 per cent to 0.007 per cent decrease in banks' credit to the private sector. This crowding out effect is found to be more pronounced for the banks having merchant banks and brokerage wings.

Keywords: Banking Sector, Capital Market Investment, Private Sector Credit

JEL Classification: G1, G3, E5

I. INTRODUCTION

Over the last 20 years or so, Bangladesh economy has experienced sustained GDP growth of around 5 per cent per year on average, significant shifts in the sectoral composition of output from agriculture to industry and services, and

¹The authors are respectively Research Fellow, Bangladesh Institute of Development Studies (BIDS) and Head of Research, Prime Finance Asset Management, Dhaka, Bangladesh. The authors would like to thank BICF Investment Climate Research Program for funding this research. We also thank the designated panel of discussants and the audiences of the workshop held under BICF Investment Climate Research Program on 16th January 2010 and also the discussants and participants of the draft report presentation at ERG on 25th November 2010. We are indebted to the Research Division of Bangladesh Bank, especially Dr. Md. Akhtaruzzaman, Economic Advisor, for helping us collecting data on banks' capital market exposure.

growth of share of private sector in investment and output. At present industry and service sectors combined produce 80 per cent of total output. This sustained private sector led growth is argued to be made possible by the phenomenal growth of banking sector over this period. It is worth noting that non-bank financial institutions (NBFIs) are at a very immature stage of development and the role of capital market in mobilising funds for the firms is very limited. In FY2009 commercial banks supplied more than 90 per cent of total private sector credit, while the rest came from NBFIs and microfinance institutions (MFIs). In this backdrop, any policies or events that have direct bearing on the banking sector can impact the growth of the private sector and overall macroeconomic performance of the economy.

This study covers the period 1990-2009. It may be noted that towards the end of the study period, especially after 2006, there were some new developments in the local financial market. The growth of credit to the private sector slowed down and commercial banks piled up huge idle liquidity during 2007-08. Recent meltdown of global economy and local infrastructural bottlenecks might have contributed to this sluggish growth of the private sector credit. But, surprisingly, the banks' profits were sky-rocketing. There were also no downward adjustments of the lending rates. Some bank level observations reveal that income from the capital market was contributing largely to the growth of profit of the banks (see Figures 1, 2 and 3).

Figure 1: **Ratio of Credit to Asset**

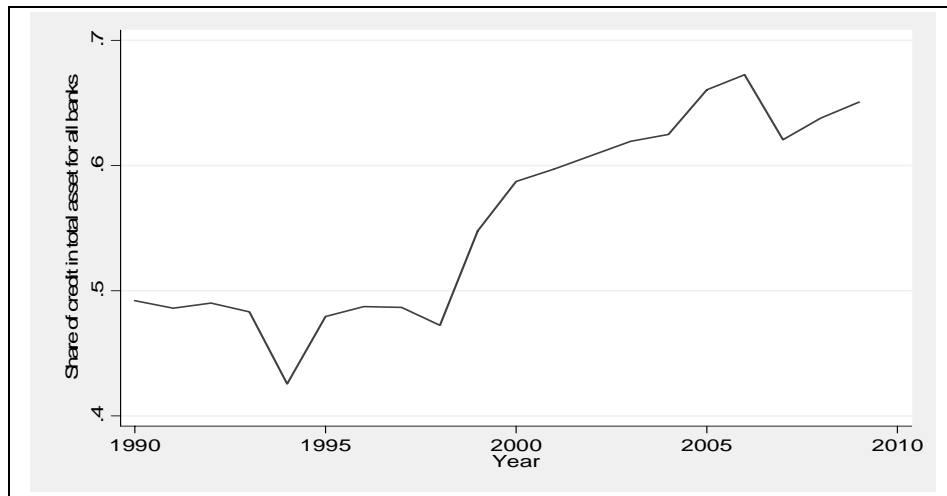


Figure 2: Ratio of Capital Market Investment to Asset

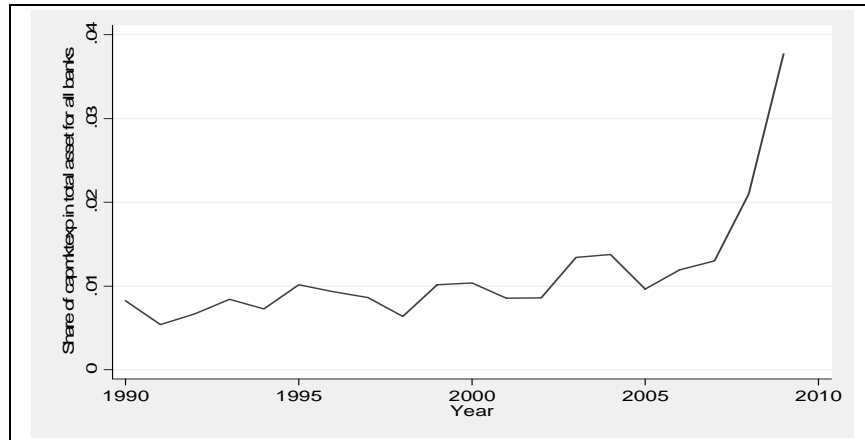
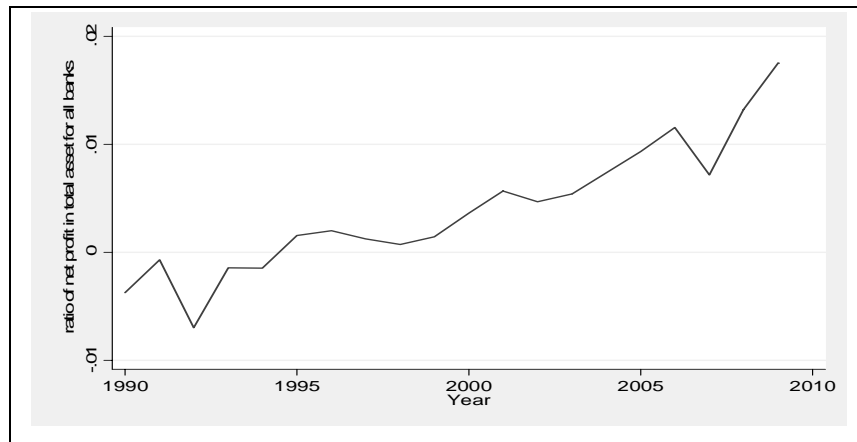


Figure 3: Trends of Net Profit after Tax for all Banks



Figures 1, 2 and 3 set the tone of the main issues of the paper. Figure 1 shows that the share of credit to the private sector in total asset of banks had been hovering around 50 per cent till 1998. Since then the share of private sector credit picked up very fast and reached about 65 per cent of total asset in 2007. There was a dip in 2008 and it picked up again. The share of investment in capital market in total asset (Figure 2), on the other hand, remained stable at around 1 per cent. It saw a steep increase after 2006 and it quadrupled in just 3 years. In 2009, the share was about 4 per cent of total asset. During 2007-09, growth of investment in capital market outpaced the growth of private sector credit. Figure

3 shows that ratio of net profit after tax to total asset for all banks became positive in the year 1995 and it started to increase slowly since then. During the period of 2007-09, the ratio registered a steep increase similar to the capital market investment of the banks. In short, it is clear from the above figures that the sluggish growth of bank credit was accompanied by massive growth of banks' investment in capital market as well as their profits.

Given the above situation, it is an opportune and important question to ask: if banks' investment in capital market has any role in slowing down the credit expansion to the private sector.

Conceptually, the effect of banks' greater investment in capital market on private credit is not unambiguous. Banks have incentives to divert their portfolio to the capital market if the rate of expected return from the capital market is higher than the return from investing in the private real sector. This may make a bank reluctant and "lazy" in disbursing credit to the private sector, even if there is huge idle liquidity. The cost of idle liquidity can be well compensated by the income from the capital market. Higher expected return from the capital market may induce banks to reject socially desirable large projects with higher risk (e.g., physical infrastructure, etc.).

Furthermore, if banks perceive that the investment in capital market involves lesser risk and higher returns, this may also induce banks to lend and invest in capital market. The "safe" investment in capital market may augment banks' risk bearing capacity. In this case, we can expect a positive impact of banks' capital market investment on the private sector credit. Theoretically, the effect of banks' greater investment in capital market on the supply of private credit can go either way. Therefore, it is an important empirical question.

One could argue that since both lead to private sector investment, why it is important if banks invest their resources in the capital market or provide direct credit. It is important to note that the degree of substitutability between borrowing from the banking sector and raising capital from the stock market is very low in Bangladesh. There is almost no incentive for the small and new firms to go public. Readymade garment (RMG) sector in Bangladesh is a good example. There are more than 5,000 RMG units in Bangladesh and among them less than 10 firms are listed in the capital market. Moreover, banking sector's involvement in the stock market may lead to overvaluation of the issues, given their limited supply. It may ultimately lead to the collapse of the capital market (e.g., bubble burst) and adversely impact the quality of asset of the banking sector, the growth of private credit and consequently the overall economic growth.

We collect and compile bank level information on private sector credit, banks' capital market investment and other bank specific characteristics such as profitability and asset quality. For better conceptualisation, we first categorise the banks with regard to size (small, medium I, medium II and large), ownership (private vs. public), age (1st, 2nd and 3rd generations), and whether they have merchant banks or brokerage houses. Descriptive statistics shows that medium size banks had much higher capital market investment than the small and large banks. Capital market investment of private banks was much higher than the industry average. While capital market investment had gone up sharply for all generations of banks during 2007-09, it was higher for 2nd generation banks than other generations.

We also estimate the impact of banks' investment in capital market on private sector credit. To do so, we run OLS and also Bank Fixed Effect to control for unobserved heterogeneity of the individual banks. We also use a sub-sample of the period 2000-09 to isolate the effect of most recent development. Regression results show that the effect of banks' investment in capital market is insignificant for the full sample but negative and significant for the sub-sample 2000-2009. This indicates that crowding out is more pronounced for the sub-sample. We found that a 1 per cent increase in banks' capital market investment is associated with about 0.006 - 0.007 per cent decrease in banks' private sector credit. This result is robust to controlling for Bank Fixed Effect and time trend. We also examine if there is any heterogeneity of impact. Results show that crowding out effect is significantly higher for the banks with merchant banks or brokerage houses.

The rest of the paper is organised as follows. Section II briefly discusses the relevant literature, section III documents trends in capital market up to October 2009, section IV provides a conceptual note for studying crowding out effect, section V briefly discusses the data sources and relevant variables, section VI elaborates the trends in banks' investment in capital market and private sector credit using graphs, section VII presents the regression results and section VIII draws conclusion.

II. REVIEW OF LITERATURE

The debate on crowding out of private sector investment is generally centered around the impact of government borrowing on private sector credit (Emran and Farazi 2009). It is argued that opportunities to invest in safe government securities make commercial banks reluctant to lend in risky private

sector, and thus crowding out private investment. There is no robust evidence of crowding out effect for Bangladesh. Majumder (2008) studied the effect of government borrowing on private investment in Bangladesh and found no significant impact. Country case studies as well as cross country literature are also divided on this issue. Miguel (1994) found that public investment causing a crowding-in rather than a crowding-out in Mexico while using a panel of developing countries, Emran and Farazi (2009) estimated that a \$1 more borrowing by government reduces private credit by about \$1.40.

This study is closely related to the above literature. However, instead of government borrowing, our variable of interest is banks' investment in the capital market. To the best of our knowledge, there is no study on this particular issue we are probing, probably because this is a unique development in Bangladesh.

However, there is a large literature on the dual role of banks – as a depository bank and an investment bank and whether there is any conflict of interest (for detail discussion, see Hebb and Fraser 2003). In fact, a commercial bank, which is also a lender and underwriter, can force a firm to issue public securities and use the proceeds to repay the bank loan. That is, the bank may shift the risk of a bad loan from itself to the market. However, this specific issue is beyond the scope of this study.

In November 1999 the U. S. Congress voted to repeal the depression-era Glass-Steagall Act that separated commercial and investment banks. The U.S. commercial banks got deeply involved into investment banking following the repeal of Glass-Steagall. For example, at the end of 1999, only 55 bank holding companies had received permission to establish investment banks subsidiaries. By March 2000, over 100 banking organisations had applied to be classified as financial holding companies.

While the distinction between commercial and investment banks has blurred considerably in the developed countries, in June 2010 Bangladesh Bank directed commercial banks to form separate subsidiaries to operate any merchant banking. It is directed that a subsidiary will have to attach its own financial report in the annual financial statement of its parent company to ensure transparency. If a subsidiary company seeks to purchase more than 15 per cent shares in any company with loans from its parent bank, it will have to take approval from Bangladesh Bank.²

²Appendix 1 briefly discusses the important laws and regulations on banks' capital market exposure upto October 2009.

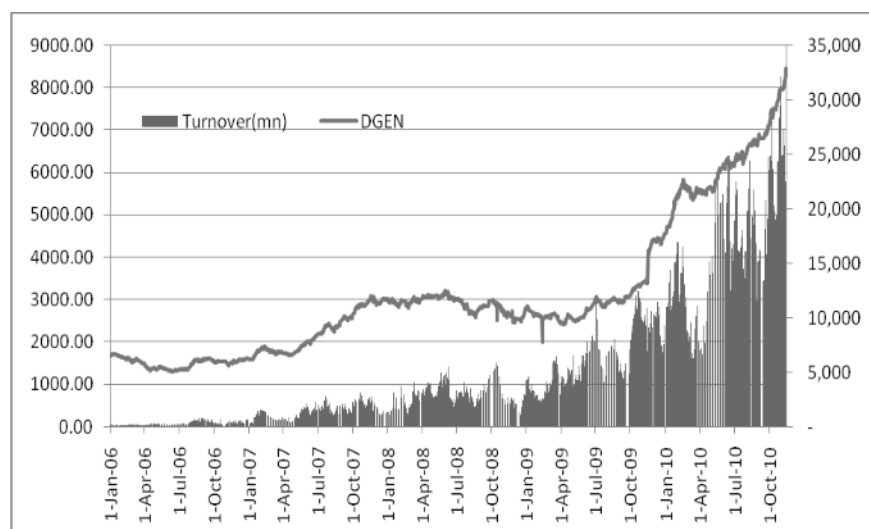
III. RECENT TRENDS IN CAPITAL MARKET

The DGEN index of the Dhaka Stock Exchange (DSE) had grown at an impressive CAGR of 14.63 per cent from 2001 to 2009. However, the benchmark DGEN index had also increased at 62 per cent in the year 2009. On the other hand, the daily average market turnover augmented significantly from BDT 2818.42 million in 2008 to BDT 6048.58 million in 2009, registering an about 114 per cent rise (Figure 4). Up to 30th October 2010 market capitalisation of DSE was around US\$ 47 billion, which was about 43 per cent of GDP and more than sixty times of the market capitalisation of the year 2000.

TABLE I
SNAPSHOT OF CAPITAL MARKET DEVELOPMENT
(ON OCTOBER 30, 2010)

Market Capitalisation (million Taka)	3,370,998.75
DSI Index	6612.14
DGEN Index	7957.12
No. of listed companies	246
No. of mutual funds	28
No. of listed securities	463

Figure 4: Turnover and DGEN of DSE



Source: Dhaka Stock Exchange (DSE).

Banks and financial institutions constitute more than one third of the total market capitalisation, followed by telecom and fuel and power, contributing about 14 per cent each (Table A.1 in appendix 2). If we define a broader financial sector to include insurance, its share in market capitalisation turned out about 40 per cent. There is only one Telecom company—Grameen Phone. Companies of fuel and power include BOC Bangladesh, Padma Oil, Eastern Lubricant, BD Welding, Summit Power, Desco, Power Grid, Jamuna Oil, Meghna Petroleum, Titas Gas and Khulna Power.

A good indicator of the growing profitability of the capital market is the DSE brokerage license price. Table A.2 in appendix 2 lists the price of brokerage licenses bought by the banks since 1998. In 1998, NCC bought the license for about Taka 4 lakh. In 2005, the price was about Taka 80 lakh. Afterwards, it had increased astronomically. In 2009, Dhaka Bank bought it for about Taka 15 crore. Unofficial sources report that a license was sold for about Taka 65 crore in 2010.

IV. CONCEPTUAL NOTE

In order to put in right perspective, we assume that there are only three assets in the economy—money, credit and stock. We also assume that there is no currency, which makes deposit and money synonymous. Also, there is no bond. The only interest rate is the lending rate³ r . The banks' equity is assumed to be zero. So, deposit is the only liability of a bank. The reserve ratio is μ , that is, $R = \mu \cdot M$. Thus, from the balance sheet identity: $M = \mu M + S + L$. That is, the investible fund, $M(1 - \mu)$, is allocated between loan L and stock S . If α is the proportion of loan holding, $\alpha = \frac{L}{M(1-\mu)}$ in total investible fund, $1 - \alpha$ is allocated to stock. This α is endogenously determined by a bank and it varies across banks. In the absence of any other asset (e.g., bond), it only captures that credit and stock are substitutes for a given amount of deposit.

³One can assume away deposit rate by considering a constant spread between lending and deposit rate.

TABLE II
HYPOTHETICAL BALANCE SHEET OF A BANK (2 ASSETS)

Asset	Liability
Reserve (R)	Deposit (M)
Bank Loan (L)	
Stock (S)	

If we include any other asset or even excess reserve, credit and stock may be complementary—an increase in investment in stock may increase lending. Therefore, introduction of any other asset such as government securities or even idle liquidity breaks down the substitutability between credit and investment in stock for a bank (Table III).

TABLE III
HYPOTHETICAL BALANCE SHEET OF A BANK (2 ASSETS +EXCESS LIQUIDITY)

Asset	Liability
Reserve (R)	Deposit (M)
Bank Loan (L)	
Stock (S)	
Excess Reserve (E)	

However, the degree of substitutability or complementarity depends on bank-specific characteristics (the supply side), overall macroeconomic conditions (demand side) and also the policy and regulatory environment of money and stock markets.

The recent global recession along with infrastructural problems (e.g., electricity, gas, etc.) has slowed down the industrial and manufacturing production and thus has lowered the demand for credit and made the private sector creditors more risky. If the deposit growth does not fall, excess liquidity of the banks will increase in the absence of any other financial instruments to invest. In this backdrop, banks may find investing in stock market more profitable than lending to private sector or holding idle liquidity, despite the high risk of the capital market.

The demand factors may explain why banks may be willing to invest in capital market but it does not explain why some banks invest more than others.

This is because banks differ in size, experience, profitability and risk bearing capacity.

Larger banks with greater risk bearing capacity may invest more in stock market. Some banks can be more aggressive (less risk averse) than others and invest more in the capital market. Managers and directors of some banks having experiences in working with/in capital market may feel comfortable investing more assets in stock market than others. These banks may have more inside information about the stock market. As a result, banks with merchant banks or brokerage houses may have higher investment in the market.

Following the above discussion, the relevant empirical question regarding the heterogeneity of impact is: Does the extent of crowding out/in vary with the size, age, ownership and having brokerage houses or merchant bank wings?

V. DATA AND RELEVANT VARIABLES

This study uses secondary data of two categories: banking sector data and macroeconomic data. We collected data on the banking sector from annual reports of the commercial banks. However, the annual reports do not contain detail breakdown of investment and income from capital market. As a result, with the help of Bangladesh Bank's research division, we sent a questionnaire (see appendix 3) to all banks. We combine this collected data directly from the banks with the data from the annual report to create the variable on banks' capital market investment. Macroeconomic data are collected from World Bank's online Data Bank.⁴

Note that we could not collect bank level information for all banks for the period 1990-2009. Since our source of data is the Annual Report of the banks, some of the older reports were not available with the banks or with any library in Bangladesh. Our full regression sample (Table VI) thus contains 399 observations of 42 banks.

Conceptually, it is important to distinguish between investment in capital market and income from capital market for a bank. Investment generally takes place in the form of lending, direct purchase of share and operating cost of merchant bank or brokerage house. On the other hand, a bank can earn from capital market from four sources: (i) capital gain, (ii) brokerage fees, (iii) interest

⁴ <http://databank.worldbank.org/ddp/home.do>

income and (iv) dividend income. Note that in this study we only consider banks' investment in capital market.⁵

Return on asset (ROA) is calculated as net profit after tax as a ratio of total asset. Asset quality is the net non-performing loan divided by total asset. We use the following definitions of generations of banks: first generation banks came into operation before 1990, second generation between 1990 and 1999 and third generation after 1999.

Table IV presents the descriptive statistics of the variables used in regression model. The data show that about 58 per cent of total asset is credit to the private sector while this share is about 8 per cent to the public sector, on an average. First, second and third generation banks account for 52, 28 and 20 per cent of the full sample respectively. In our sample about 48 per cent of the observations are from the banks of size medium II. Medium I and large banks comprise about 23 and 16 per cent of the total sample respectively.⁶

TABLE IV
DESCRIPTIVE STATISTICS (FULL SAMPLE 1990-2009)

	Definition	Mean	Standard Deviation
Private sector credit	Ratio of private sector credit to total asset	0.58	0.07
Capital market investment	Ratio of investment in capital market to total asset	0.13	0.007
Return on asset (ROA)	Ratio of net profit after tax to total asset	0.02	0.05
Asset quality	Ratio of net non performing loan to total asset	0.01	0.02
Generation 1	Year of operation < 1990	0.54	
Generation 2	1990 ≤ Year of operation < 1999	0.27	
Generation 3	Year of operation ≥ 1999	0.19	
Small	Total asset < 20,000	0.13	
Medium I	20,000 ml. ≤ Total asset < 50,000 ml.	0.23	
Medium II	50,000 ml. ≤ Total asset < 100,000 ml.	0.48	
Large	Total asset ≥ 100,000 ml.	0.16	
Private	Privately owned	0.88	
Local	Owned by local private or public	0.88	
Merchant	Banks have brokerage house or merchant bank wings	0.16	
Real GDP growth	Annual growth rate of real GDP	5.52	0.78

⁵Definition of each part is provided in the Questionnaire in appendix A.3. We have appended the abridged questionnaire because we think it is important to be transparent how the data on capital market is collected and how the variables are defined.

⁶Definition of size of banks is described in section VI.

VI. BANKS' INVESTMENT IN CAPITAL MARKET AND PRIVATE SECTOR CREDIT: SOME TRENDS

First, we examine the basic trends of capital market investment and private sector credit. To this end, we categorise the banks into different groups based on size, age, ownership and whether they have merchant bank or brokerage house.

6.1 Size of Banks

In order to study how the investment in capital market and in private sector credit changes with the size of the banks, we first classify the banks according to their asset size. In order to do so, we study the distribution of assets of all banks in 2008 (Figure 5). Note that 90 per cent of banks have asset below Taka 100 billion and hence the Figure 5 is not very informative to classify the banks. Therefore, we look at the distribution of assets of banks below Taka 100 billion in the year 2008 (Figure 6). Figure 6 clearly identifies a number of clusters. We see that a number of banks cluster below Taka 20 billion, and two large masses lie between Taka 20 billion and Taka 50 billion and between Taka 50 billion and Taka 100 billion.

Figure 5: **Distribution of Asset of All Banks in 2008 (assets in Million Taka)**

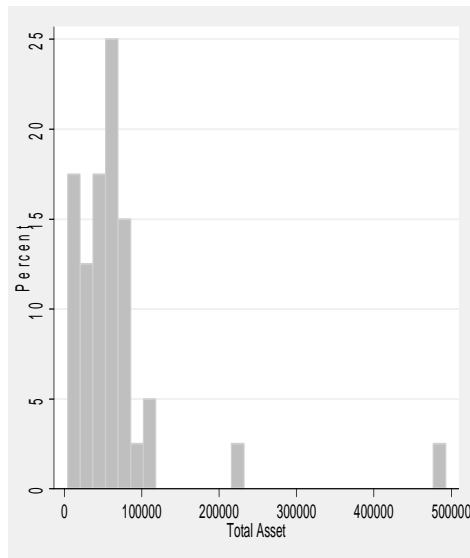
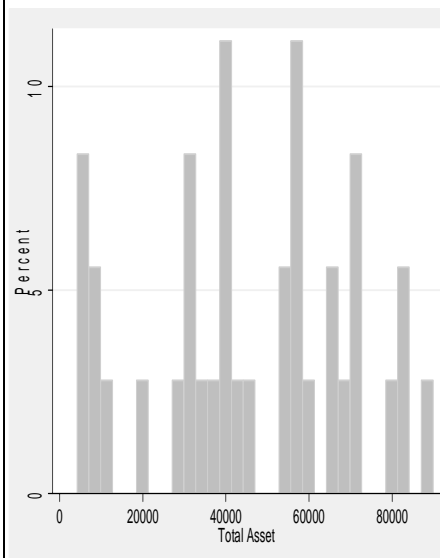


Figure 6: **Distribution of Asset Below 100,000 Million Taka (2008)**



Therefore, one can safely classify the banks into 4 groups:

- i. Small (total asset < 20,000)
- ii. Medium I ($20,000 \leq \text{total asset} < 50,000$)
- iii. Medium II ($50,000 \leq \text{total asset} < 100,000$)
- iv. Large (total asset $\geq 100,000$)

The list of banks in these groups is given in Table V.

TABLE V
SIZE OF THE BANKS (BASED ON THE YEAR 2008)

(million taka)

Small (total asset < 20,000)	Medium I ($20,000 \leq \text{total asset} < 50,000$)	Medium II ($50,000 \leq \text{total asset} < 100,000$)	Large (total asset $\geq 100,000$)
1. Bank Alfalah	1. Al Arafah Islami Bank	1. AB Bank	1. Islami Bank
2. BCBL	2. Citi Bank NA	2. Bank Asia	2. Prime Bank
3. Habib Bank	3. First Security Islamic Bank	3. BRAC Bank	3. Sonali Bank
4. ICB Islamic Bank	4. IFIC Bank	4. City Bank	4. Janata Bank
5. National Bank of Pakistan	5. Jamuna Bank	5. Dhaka Bank	5. Agrani Bank
6. State Bank of India	6. Mutual Trust Bank	6. Dutch-Bangla Bank	6. Standard Chartered Bank
7. Woori Bank	7. One Bank	7. Eastern Bank	
	8. Premier Bank	8. Exim Bank	
	9. Shahjalal Islami Bank	9. HSBC	
	10. Social Investment Bank	10. Mercantile Bank	
	11. Standard Bank	11. National Bank	
	12. Trust Bank	12. NCC Bank	
		13. Pubali Bank	
		14. Rupali Bank	
		15. Southeast Bank	
		16. UCBL	
		17. Uttara bank	

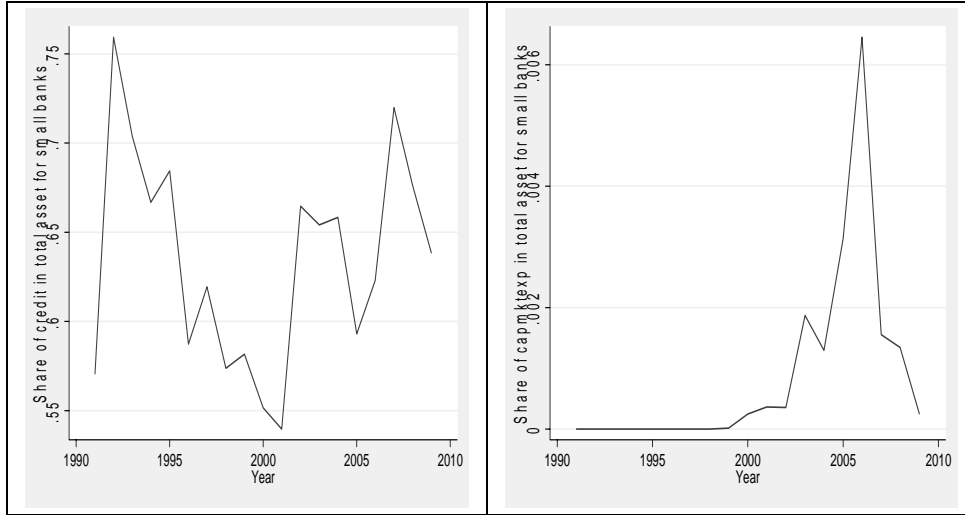
Note that the Small banks are mostly foreign banks with limited exposure and two local banks also fall into this category. Medium I banks are primarily third generation banks while Medium II banks are a mix of all generations. The Large banks are mostly the public banks with two local and one foreign private bank. Figure 7 shows how the share of private sector credit and capital market investment changes with the size of the banks.

Figure 7: Private Sector Credit, Capital Market Investment and Bank Size

Small Banks

Ratio of Credit to Asset

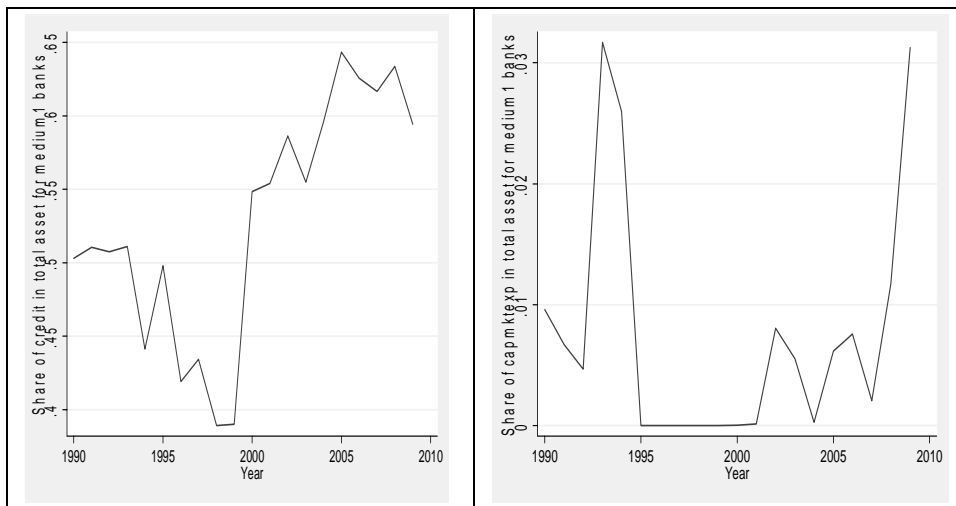
Ratio of Capital Market Investment to Asset



Medium I Banks

Ratio of Credit to Asset

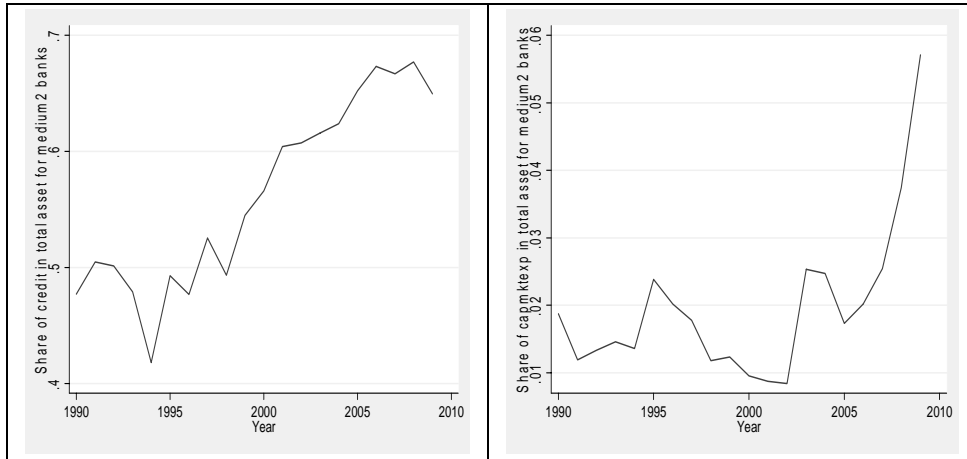
Ratio of Capital Market Investment to Asset



Medium II Banks

Ratio of Credit to Asset

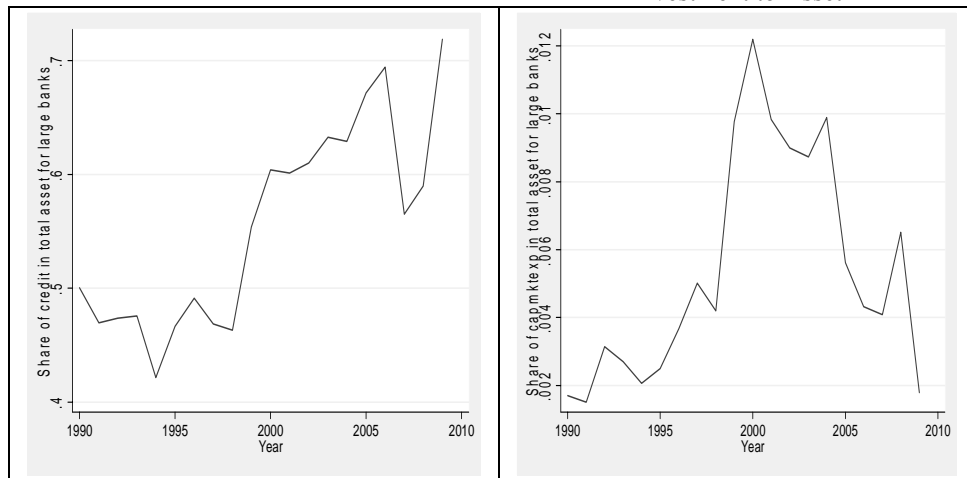
Ratio of Capital Market Investment to Asset



Large Banks

Ratio of Credit to Asset

Ratio of Capital Market Investment to Asset

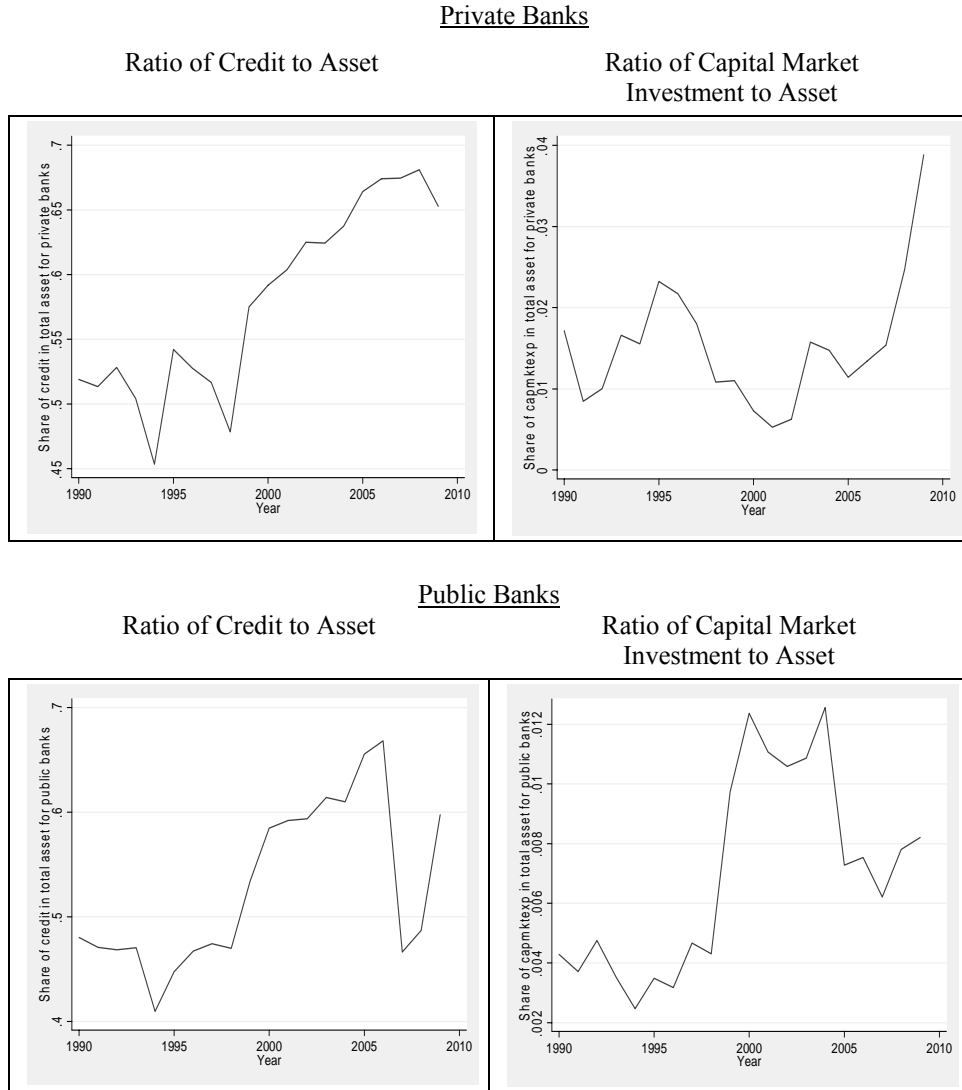


From Figure 7 it is evident that except for the large banks, share of private sector credit dipped after 2007. Share of capital market investment had increased sharply for medium banks only and medium size banks had much higher capital market investment than the small and large banks.

6.2 Ownership

Figure 8 shows how credit to private sector and capital market investment change with the ownership of the banks, that is, whether the bank is owned by private or public sector.

Figure 8: **Private Sector Credit, Capital Market Investment and Ownership of Banks**

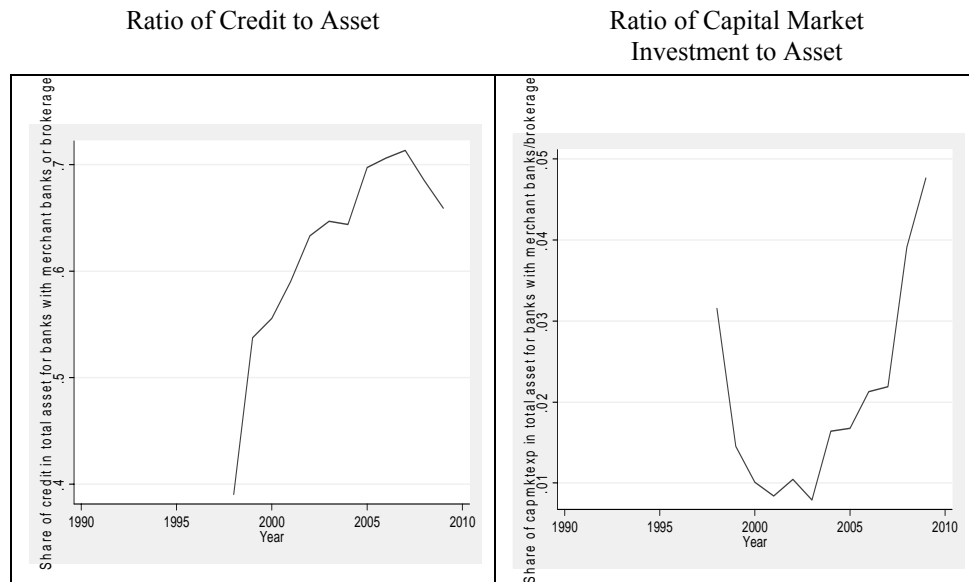


We note from Figure 8 that share of credit had decreased for private banks but increased for public banks in 2008-09. Capital market investment in private banks was much higher than the industry average. Though capital market investment for public banks was much lower than the industry average, it had increased in 2008-09.

6.3 Banks with Merchant or Brokerage Wings

The list of the banks with brokerage house and merchant bank wings is given in Table A.1 and A.2 in appendix 4. Figure 9 shows that share of credit to private sector had decreased in 2008-09 for the banks with merchant banks and brokerage houses. During this period share of capital market investment had increased very steeply and it was much higher than the industry average.

Figure 9: **Private Sector Credit, Capital Market Investment and Merchant/Brokerage Wings**



6.4 Age of Banks

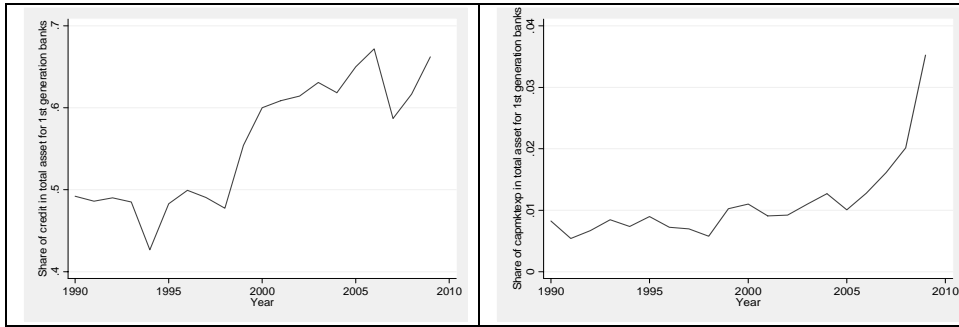
Figure 10 shows that except for first generation bank, share of credit had gone down in recent years for other two generations. Capital market investment had gone up sharply for all generations. However, capital market investment was higher for the 2nd generation banks than that of 1st and 3rd generations.

Figure 10: Private Sector Credit, Capital Market Investment and Age of Banks

1st Generation Banks

Ratio of Credit to Asset

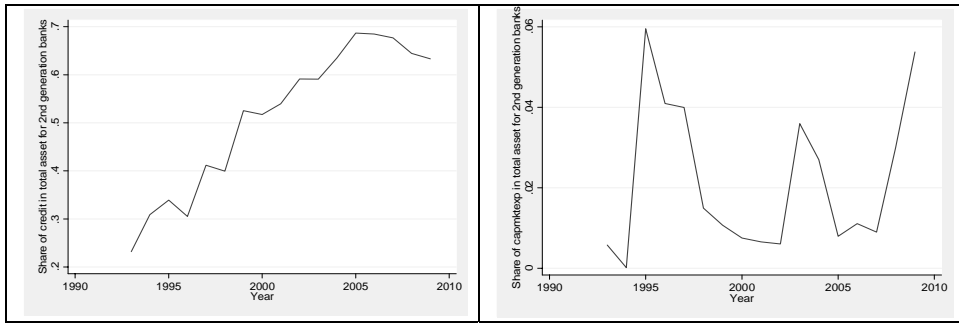
Ratio of Capital Market Investment to Asset



2nd Generation Banks

Ratio of Credit to Asset

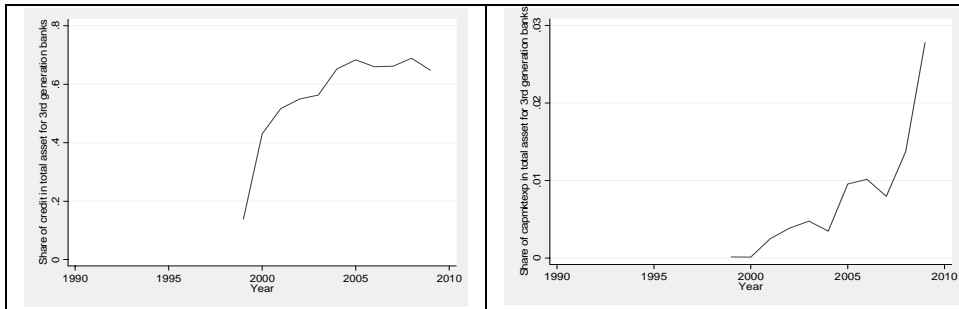
Ratio of Capital Market Investment to Asset



3rd Generation Banks

Ratio of Credit to Asset

Ratio of Capital Market Investment to Asset



VII. REGRESSION RESULTS

7.1 Model and Estimation

The main regression model we estimate is:

$$\text{private sector credit}_{i,t} = \beta_0 + \beta_1 \cdot \text{capital market investment}_{i,t} + \beta_2 \cdot \text{bank specific variables}_{i,t} + \beta_3 \cdot \text{macroeconomic variables}_t + u_{i,t}$$

Here i corresponds to a commercial bank and t refers to a year from 1990 to 2009. The dependent variable is the log of total private sector credit. Our variable of interest is the log of bank's capital market investment. We express the terms in logarithm for nicer interpretation of the coefficients in terms of elasticities.

The other controls include both bank specific and macroeconomic variables that capture the factors affecting supply of and demand for credit respectively. The bank specific variables include bank's size, age, type of ownership, whether bank has merchant bank, profitability (ROA), and quality of asset. Macroeconomic variable such as real GDP growth is used to capture credit demand. β_1 is the parameter of interest. If banks' investment in capital market crowds out private credit, $\beta_1 < 0$. If risk sharing dominates, we can expect β_1 to be insignificant, or in extreme case, $\beta_1 > 0$.

We run both OLS and Bank Fixed Effect to estimate the impact of banks' investment in capital market on private sector credit. Table VI presents the regression results. First two columns correspond to the full sample and third and fourth columns correspond to the subsample of 2000-09. In columns 1 and 3 we control for bank specific characteristics while in columns 2 and 4 we run Bank Fixed Effect. Since Bank Fixed Effects capture only the within-effects, some control-dummies that are fixed over time are dropped.

Table VI shows that capital market investment is found to have a negative impact on the share of credit in total asset for the sub-sample of 2000-2009. That is, as the share of capital market investment increases, it tends to decrease the share of credit, indicating crowding-out effect. The size of the coefficients shows that 1 per cent increase in banks' capital market investment is associated with about 0.006 - 0.007 per cent decrease in banks' private sector credit. This result is robust to controlling for Bank Fixed Effect and time trend.

Surprisingly, bank specific characteristics such as profitability, asset quality, age, size, types of ownership, and whether a bank has merchant bank wing turned out to be insignificant for both full and sub-sample. Real GDP growth has

positive and significant impact, capturing the greater demand for credit in the periods of higher growth.

TABLE VI
REGRESSION RESULTS: DEPENDENT VARIABLE:
LOG (PRIVATE SECTOR CREDIT)

Variables	1	2	3	4
	Full sample (1990-2009)		Sub sample (2000-2009)	
Log (capital market investment)	-0.006 (0.006)	-0.009 (0.008)	-0.006** (0.004)	-0.007** (0.003)
ROA	0.338 (0.337)	0.223 (0.356)	-0.007 (0.236)	-0.023 (0.258)
Asset quality	0.208** (0.096)	0.276** (0.114)	0.006 (0.065)	0.062 (0.083)
Real GDP growth	-0.006 (0.009)	-0.005 (0.009)	0.021*** (0.007)	0.022*** (0.007)
Year	0.153*** (0.002)	0.153*** (0.002)	0.130*** (0.002)	0.131*** (0.002)
Generation 2	0.001 (0.013)		0.003 (0.009)	
Generation 3	0.019 (0.017)		0.005 (0.011)	
Medium I	-0.020 (0.026)		-0.000 (0.017)	
Medium II	0.005 (0.024)		0.009 (0.016)	
Large	0.017 (0.028)		0.012 (0.020)	
Private	-0.006 (0.018)		-0.006 (0.016)	
Local	0.009 (0.024)		0.001 (0.016)	
Merchant bank	-0.008 (0.014)		-0.008 (0.009)	
Constant	-291.919*** (3.053)	-292.097*** (3.212)	-246.039*** (3.578)	-248.244*** (3.935)
Bank Fixed Effect	No	Yes	No	Yes
Observations	399	399	281	281
R-squared	0.987	0.987	0.973	0.974

Note: Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

We also study the heterogeneity of impact. We interact banks' investment in the capital market with generation, size, ownership and having merchant bank. The results on cross-terms are presented in Table VII. The regression results show that extent of crowding out effect varies only with the banks having merchant wing or brokerage house.

One could argue that banks' investment in capital market is an endogenous choice variable for the banks, which is simultaneously determined by banks' other investment decision. We acknowledge this limitation. However, it is very hard to find suitable instruments at the bank level which is correlated with capital market investment but uncorrelated with the error terms. Since we control for Bank Fixed Effect, which only exploits variations within banks, our estimates are free from any bank level heterogeneity that may confound the results.

TABLE VII
HETEROGENEITY OF IMPACT: (2000-2009)

VARIABLES	1	2	3	4	5	6	7
Log (capital market investment)	-0.005	-0.024	-0.007*	-0.005	-0.006	-0.005**	-0.005**
	(0.003)	(0.053)	(0.005)	(0.004)	(0.006)	(0.003)	(0.003)
ROA	0.053	-0.051	-0.020	-0.020	-0.028	-0.049	-0.025
	(0.238)	(0.270)	(0.232)	(0.233)	(0.232)	(0.237)	(0.237)
Asset quality	0.042	0.062	0.062	0.062	0.056	0.061	0.062
	(0.071)	(0.068)	(0.069)	(0.069)	(0.070)	(0.069)	(0.069)
Real GDP growth	0.025***	0.022***	0.022***	0.022***	0.023***	0.022***	0.022***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Year	0.133***	0.131***	0.131***	0.131***	0.131***	0.131***	0.131***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Capital*Merchant bank	-0.004**						
	(0.002)						
Capital*Private		0.017					
		(0.053)					
Capital*generation 2			0.001				
			(0.006)				
Capital*generation 3				-0.003			
				(0.006)			
Capital*Medium I					-0.007		
					(0.005)		
Capital*Medium II						0.006	
						(0.005)	
Capital*Large							-0.002
							(0.020)
Constant	-252.175***	-248.297***	-248.276***	-248.187***	-247.756***	-247.760***	-248.277***
	(4.810)	(4.507)	(4.509)	(4.500)	(4.487)	(4.518)	(4.515)
Bank Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	281	281	281	281	281	281	281
R-squared	0.975	0.974	0.974	0.974	0.974	0.974	0.974

Note: Robust standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

VIII. CONCLUSION

Since banking sector is the mainstay of the financial landscape of Bangladesh, the recent development regarding banking sector's greater involvement in capital market has raised concerns. It can destabilise the capital market by injecting depositor's money and thus helping asset-price to hike and create bubble. On the other hand, it may lower the credit supply to the private sector, which will in turn lower private investment and thus overall economic growth. In this backdrop, this paper examines if banks' greater investment in the capital market has any impact on the private sector credit using bank level data for the period 1990-2009.

Results show strong indication for crowding out effect. That is, banks' greater investment in capital market has led to lower credit to the private sector. We estimate the size of the impact—a 1 per cent increase in banks' investment in stock market leads to about 0.006-0.007 per cent decline in banks' private sector credit disbursement. This result is robust to controlling for Bank Fixed Effect and time trend. Regression results also show that that crowding-out effect is more profound for the banks with merchant bank wings and brokerage houses.

This paper suggests that the regulators and policy makers need to strengthen prudential regulations as well as use monitoring and supervision to restrict banks' excessive exposure to the capital market. The Bangladesh Bank has already enacted a number of new laws and regulations to control and monitor banks' investment in the capital market. The Bangladesh Bank also requires achieving the technical capabilities to address the asset bubbles at their infancy and steer the market and economy out of danger.

The results of the study also suggest that the extent of investment in capital market and its impact on private sector credit critically depends on the extent of banks' dual roles in credit and capital markets. Therefore, the rules and regulations for separating a scheduled bank from investment banking should be streamlined. From policy point of view, it is important to note that not only the investment in capital market but also its impact on other assets (e.g., credit) should be taken into account while evaluating banks' excessive exposure in capital market. Some banks may have higher investment in capital market with very low crowding-out effect or even higher crowding-in effect.

This study also indicates that as the share and number of non-credit asset in banks' increases, the relationship between money and credit becomes weaker. As investment in securities in stock market has emerged as a significant component

of the asset of banks, it has implications for monetary policy effectiveness when the central bank wants to affect the flow of credit through its instruments.

REFERENCES

- Emran, Shahe and Subika Farazi. 2009. "Lazy Banks? Government Borrowing and Private Credit in Developing Countries." unpublished.
- Hebb, Gregory M. and Donald R. Fraser. 2003. "Conflict of Interest in Commercial Bank Security Underwritings: United Kingdom Evidence." *Quarterly Journal of Business and Economics*, January 01.
- Miguel, D. Ramirez. 1994. "Public and Private Investment in Mexico, 1950-90: An Empirical Analysis." *Southern Economic Journal*, 61(1).
- Majumder, Alauddin. 2008. "Does Public Borrowing Crowd out Private Investment? The Bangladesh Evidence." Working Paper 0708. Policy Analysis Unit, Bangladesh Bank.

APPENDICES**Appendix 1****Changes in Laws regarding Banks' Capital Market Expouser****Loan margin ratio**

In last ten months SEC changed its decision regarding margin loan ten times.

- February 01, 2010 - The loan ratio 1:1.5
- February 01, 2010 - The stock allowed for margin loan, P/E should be below 50
- February 03, 2010 - The loan ratio 1:1
- March 15, 2010 - The loan ratio 1:1.5
- June 15, 2010 - The stock allowed for margin loan, P/E should be below 40
- July 8, 2010 - The loan ratio 1:1
- September 06, 2010 - Suspended netting facilities for non marginable shares
- September 21, 2010 – The price of marginable stock considered by adding NAV and closing price and divided by two .
- November 21, 2010- The loan ratio 1:0.5

Capital market exposure limit for banks: 15th June 2010

As per the provisions stated in section 26(2) of Bank Company Act 1991, it is mentioned in the same section that no bank can invest in shares of various companies in aggregate with an amount of 10 per cent of total liabilities of its own.

Also, no banking company can hold shares in any company whether as pledge or mortgagee or absolute owner of an amount of 30 per cent of total of its own paid-up share capital and reserves, or 30 per cent of the paid-up capital of that company, whichever is less.

Single Borrower Exposure: July 22nd 2010

The exposure limit has been set at Tk 100 million in the case of merchant banks and Tk 50 million for brokerage houses.

Subsidiary of Brokerage and merchant bank: 15th June 2010

The banks will not be allowed to conduct merchant banking or brokerage house business from October 1, 2010 without formation of subsidiary companies for the purpose.

Appendix 2

TABLE A.1

SECTORAL DECOMPOSITION OF MARKET CAPITALISATION

Sector	Market capitalisation (million taka)	% of sectoral market capitalisation
Banks	545217.17	23.61
Other Financial Institutions	237848.34	10.30
Investments	30069.74	1.30
Engineering	130622.99	5.66
Food and Allied Products	56255.79	2.44
Fuel and Power	321176.32	13.91
Jute	841.28	0.04
Textile	83802.70	3.63
Pharmaceuticals & Chemicals	192265.37	8.32
Paper and Printing	1417.40	0.06
Services and Real Estate	18579.47	0.80
Cement	74767.20	3.24
IT	4665.22	0.20
Tannery	16869.45	0.73
Ceramic	57774.98	2.50
General Insurance	69500.36	3.01
Life Insurance	53662.25	2.32
Telecom	328392.97	14.22
Miscellaneous	85849.05	3.72
Grand Total	2309578.04	100

TABLE A.2

DSE BROKERAGE LICENSE PRICE

Year	Buyer	License Price (Taka)
1998	NCC	400,385
1999	Dhaka Bank	9,120,000
2002	Prime Finance	7,612,500
2005	Pubali Bank	8,000,000
2006	Mutual Trust Bank	8,000,000
2006	IDLC	15,225,000
2007	National Bank Limited	17,750,000
2007	Islami Bank	24,453,399
2008	Al Arafah	40,261,999
2008	Shahjalal Bank	58,994,699
2009	IFIC	74,989,000
2009	Bank Asia	153,319,000

Data source: DSE.

Appendix 3

Questionnaire for Banks

A. Total investment in capital market (million taka)

Year	Lending	Direct Investment	Operating cost of brokerage house	Operating cost of merchant banking
1990				
1991				
.....				
2008				
2009				

Definition of the variables:

Lending: Disbursement of loans and advances through capital market operations (Brokerage or Merchant Banking operations)

Direct Investment: Investment in capital market instruments (Listed and non listed shares).

Operating cost of brokerage house: The total cost of operation if the bank has brokerage operation (subsidiary or wing).

Operating cost of merchant banking

The total cost of operation if the bank has merchant banking operation (subsidiary or wing).

B. Total income from capital market (million taka)

Year	Interest income	Capital gain	Dividend income	Fees, commissions and brokerage
1990				
1991				
.....				
2008				
2009				

Definition of the variables:

Interest income: Interest income derived from loan disbursement in capital market operation (both in merchant bank and brokerage).

Capital gain: Capital gain from sales of investments of shares.

Dividend income: Dividend income from direct investment.

Fees, commissions and brokerage: Fees, commissions and brokerage from Merchant Bank and Brokerage operations.

Appendix 4

TABLE A.1

LIST OF BANKS WITH BROKERAGE HOUSE (2009)

1	NCC Bank	10	BRAC EPL
2	Dhaka Bank	11	Al Arafah Islami Bank
3	BCBL	12	IFIC Bank
4	Pubali Bank	13	The City Bank
5	MTB	14	Bank Asia
6	NBL	15	Prime Bank
7	Islami Bank	16	Premier Bank
8	Shajalal Islami Bank	17	EBL
9	Mercantile Bank	18	AB Bank

TABLE A.2

LIST OF BANKS WITH MERCHANT BANK (2009)

1	Brac EPL	8	Sonali Bank
2	Prime Bank	9	Agrani Bank
3	AB Bank	10	Southeast Bank
4	EXIM Bank	11	Standard Bank
5	Citi na	12	Jamuna Bank
6	Trust Bank	13	Mutual Trust Bank
7	Janata Bank	14	City Bank