Growing Stock Market in Bangladesh – Key Indicators Based Evaluation

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Abstract

This paper focuses on the growth of Bangladesh stock market over time. The market trends in terms of market capitalization, market liquidity, market concentration, number of listings, volatility in the market index and foreign portfolio investment were considered. The study finds that key indicators are significantly correlated. Stock market growth index is constructed considering market capitalization ratio; turnover ratio, value traded to GDP ratio and volatility in market index. The findings of the study suggest that although Bangladesh stock market is growing over time, the growth has not yet assumed any stable and obvious trend. It conclude that Bangladesh stock market is still at an early stage of its growth path with a small market size relative to GDP and is characterized by poor liquidity and high market concentration.

Key words: Stock Market, Gross Domestic Product (GDP), Chittagong Stock Exchange (CSE), Dhaka Stock Exchange (DSE).

Introduction

Demirguc-Kunt and Levine (1996), Singh (1997) and Levine and Zervos (1998) find that stock market growth plays an important role in predicating future economic growth in situations where the stock markets are active. The arguments of Demirguc-Kunt et al. (1996) indicate that economies without well-functioning stock markets may suffer from three types of imperfections: first, opportunities for risk diversification are limited for investors and entrepreneurs, second, firms are unable to optimally structure their financing packages and third, countries without well functioning markets lack information about the prospects of firms whose shares are traded, thereby restricting the promotion of investment and its' efficiency.

The proponents of stock markets emphasize the importance of having a "developed" stock market in enhancing the efficiency of investment. A well-functioning stock market is expected to lead to a lower cost of equity capital for firms and allow individuals to more effectively price and hedge risk. Finally, stock markets can attract foreign portfolio capital and increase domestic resource mobilization, expanding the resources available for investment in developing countries. Recognizing the importance of stock market on economic growth, prudential authorities such as World Bank, IMF and ADB undertook stock market development programs for emerging markets in developing countries during 80s and 90s and the emerging stock markets have experienced considerable development since the early 1990s. The market capitalization of emerging market countries has more than doubled over the past decade growing from less than $2 trillion in 1995 to about $5 trillion in 2005 (Yartey, 2008). As a percentage of world market capitalization, emerging markets are now more than 12 percent and steadily growing (Standard and Poor, 2005)**.** The government of Bangladesh also undertook the Capital Market Development Program (CMDP) supported by the ADB on 20 November 1997. The CMDP aimed to broaden market capacity and develop a fair, transparent, and efficient domestic stock market to attract larger amounts of investment.

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The assessment of the growth of Bangladesh stock market over the last few years thus remains an important empirical issue. This study provides empirical measures of the level of stock market growth in Bangladesh by analyzing key empirical indicators of stock market development.

Objectives of the study

The objectives of the study are:

- ✓ To investigate the pattern of Bangladesh stock market growth;
- ✓ To identify various indicators of Bangladesh stock market growth;
- ✓ To develop an index of Bangladesh stock market growth.

Data and Methodology

I examine secondary data of stock market of Bangladesh. The study covers time period from 1990-91 to 2006-07. Data are collected from various issues of annual report of Securities and Exchange Commission (SEC) of Bangladesh, Quarterly Review of SEC, Monthly Review of Dhaka Stock Exchange (DSE), Bangladesh Economic Review, Statistical Year Book of Bangladesh, Website of Dhaka Stock Exchange, and Website of SEC Bangladesh. Descriptive statistics, correlation matrix, and trend equation of key indicators are used for the analysis. To compute the index of volatility and stock market growth I follow the procedure of computing simple average of mean removed value of different indicators of stock market development (Demirguc-Kunt and Levine, 1996). Detail of the methodology is discussed in the section of "index of stock market development".

Brief History of Stock Market in Bangladesh

The stock market history of Bangladesh refers back to 28 April, 1954 when the East Pakistan Stock Exchange Association Ltd. was established. Formal trading began on the bourse in 1956. The trading was suspended during the liberation war of Bangladesh in 1971. Operation resumed again in the 1976 with the change in government policy. During 1976, there were only 9 listed companies with total paid up capital of Tk.0 .138 billion and market capitalization of Tk. 0 .147 billion which was 0.138 % of GDP (Khan, 1992). Since then the stock exchange continued its journey of growth. The second stock exchange of the country, the Chittagong Stock Exchange(CSE) was established in December 1995.In order to control operation of the stock exchanges and trading of stocks of listed companies, the government of Bangladesh established the Securities and Exchange Commission of Bangladesh on 8th June, 1993 under the Securities and Exchange Commission Act, 1993 .The mission of the SEC is to protect the interests of securities investors, develop and maintain fair, transparent and efficient securities markets,   ensure proper issuance of securities and compliance with securities laws.

From the inception the stock market of the country was growing in a slow pace. There was a large surge in the stock market in the summer and fall of 1996 evidenced by a 197.43%, 372.30% and 370.51% increase in the market capitalization, total annual turnover and daily average turnover respectively in DSE and 506.63%, 210.2% and 615.15% increase in the market capitalization, total annual turnover and daily average turnover in CSE. DSE general index grew from 832 in January 1 1996 to 3567 in November 14, 1996 while that of CSE grew from 409.4 in 1995 to 1157.9 in 1996. The market, however, crashed in December of 1996 and the index started to decline significantly since then with the index assuming a value of 507.33 as of November of 1999, a cumulative decline of 83.44% from 1996 to 1999 with the annual rate of 27.82%, and has yet to fully recover. Investors' confidence was significantly damaged because of excessive speculations, allegedly aggravated by widespread irregular activities. The government of Bangladesh undertook the Capital Market Development Program (CMDP) supported by the ADB on 20 November 1997. The CMDP aimed at (i) strengthening market regulation and supervision, (ii) developing the stock market infrastructure, (iii) modernizing stock market support facilities, (iv) increasing the limited supply of securities in the market,

(v) developing institutional sources of demand for securities in the market, and (vi) improving policy coordination. The policy matrix of the CMDP included 95 program measures. Central Depository Bangladesh Limited (CDBL) was incorporated as a public limited company on 20th August 2000 to operate and maintain the Central Depository System (CDS) of Electronic Book Entry, recording and maintaining securities accounts and registering transfer of securities; changing the ownership without any physical movement or endorsement of certificates and execution of transfer instruments, as well as various other investor services including providing a platform for the secondary market trading of Treasury Bills and Government Bonds issued by the Bangladesh Bank. CDBL went live with the Electronic Treasury Bills registry of Bangladesh Bank on 20th October, 2003 and thereafter started equity market operations on 24th January, 2004.

It was set up to facilitate the computerized delivery and settlement of securities and eliminate to the extent possible, the paper work involved in handling the transactions and that would ensure risk-free and cost-effective settlement. Before establishment of CDBL, the delivery, settlement and transfer procedures were handled manually and were plagued by lengthy delays, risks of damage, loss, forgeries, duplication and considerable investment in time and capital. Besides, both the CSE (July 1998) and the DSE (August 1998) have automatic trading services. By having automated trading system and a central depository in place, the credibility of the country's Stock Exchanges in the eyes of the prospective foreign investors are expected to grow stronger and boost investment activities in the country's stock markets. Contrastingly, foreign portfolio investment, never more than $200 million, has virtually disappeared form the stock market of Bangladesh.

Indicators of Stock Market Growth and Trend of Market Performance

Literatures provide no unique measure of indicators of stock market development. However it is evident from the literatures (see for instance, Naceuret et. al. 2007; Yartey, 2005; Demirguc-Kunt, and Ross. Levine, 1996;) that the broadly used indicators of stock market growth are market size in terms of market capitalization, liquidity of the market, market concentration, degree of listing, volatility in the market, foreign portfolio investment and integration of the market. In this study I examine all these indicators (excepting integration variable) to evaluate the growth pattern of Bangladesh stock market.

Stock market size

Market capitalization ratio equals the value of listed shares divided by GDP. Analysts frequently use the ratio as a measure of stock market size. In terms of economic significance, the assumption behind market capitalization is that market size is positively correlated with the ability to mobilize capital and diversify risk on an economy wide basis (Agarwal 2001). La Porter et al. (1997, 1998) and Levine and Zervos (1998) used the market capitalization to GDP ratio as an indicator of market development. Table 1 and Figure A show the size of Bangladesh stock market. Market capitalization ratio has increased from 1.4 % in 1990-91 to 10.2 % in 2005-06 with a sudden increase to 29.0 % in 2006-07 .Total market capitalization reached to Tk. 1366.53 billion in 2006-07 from Tk. 11.485 billion in 1990-91.This shows a remarkable cumulative increase of 117.98 times . Mean market capitalization ratio of 0.077 with a standard deviation of 0.073 points to high level of volatility in market capitalization. Linear trend line shows an upward trend in market capitalization to GDP ratio though R^2 value of 0.3821 indicates a poor model fit.

Table 1: Stock market size of Bangladesh, 1990-91 to 2006-07

Year	GDP(billion Taka)	Market capitalization (billion Taka)	Market capitalization to GDP	Year	GDP(billion Taka)	Market capitalization (billion Taka)	Market capitalization to GDP
1990-91	834.39	11.485	0.014	999-00	370.86	120.69	0.051
1991-92	906.5	10.397	0.011	2000-01	2535.46	121.586	0.048
1992-93	948.07	12.29	0.013	2001-02	2732.01	131.73	0.048
1993-94	1354.12	18.098	0.018	2002-03	3005.80	182.899	.061
1994-95	1525.18	80.657	0.051	2003-04	3329.73	439.934	.132
1995-96	1663.24	315.149	0.189	2004-05	3707.07	453.018	.122
1996-97	1807.01	124.134	0.069	2005-06	4157.28	420.850	.102
1997-98	2001.77	91.637	0.046	2006-07	4674.97	1366.53	.290
1998-99	2196.97	81.324	0.037				
Descriptive statistics of Market capitalization to GDP ratio	Mean	Standard deviation	Kurtosis	Skewness	Minimum		Maximum
	0.077	0.073	.745	.864	0.011		.290

Data source: Authors' calculation from various issues of Bangladesh Economic Review, Statistical Year Book of Bangladesh, Dhaka stock exchange (main board) and Securities and exchange commission (Annual report and quarterly review).

The second indicator of market size is the ***number of listed companies***. The rationale of including this measure is that as the number of listed company increases, available securities and trading volume also increases. Table 2 shows that during the period under study, number of listed company has grown from 149 to 273 with an average annual growth rate of 4.421% and a standard deviation of 39.006. The upward trend line (figure B) with R^2 value of .9589 points to stable growth in the number of listing.
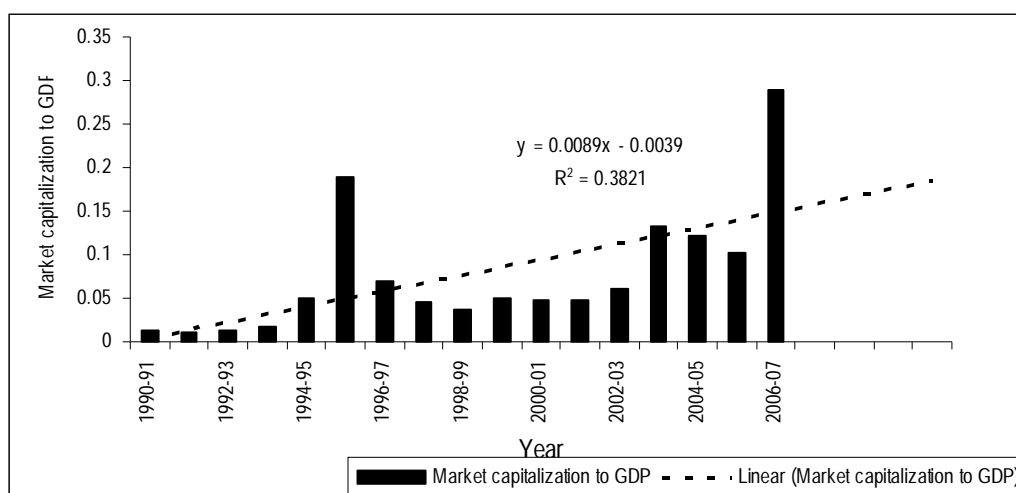
Figure A: Stock market size of Bangladesh, market capitalization to GDP ratio, 1990-91 to2006-07 with 4 years forecast

Table 2: Number of listed companies in Dhaka Stock Exchange

Year	Number of listed companies	Growth in %	Year	Number of listed companies	Growth in %
1990-91	149		1999-00	229	4.566
1991-92	153	2.685	2000-01	234	2.183
1992-93	166	8.497	2001-02	248	5.983
1993-94	201	21.084	2002-03	251	1.210
1994-95	192	-4.478	2003-04	259	3.187
1995-96	192	6.771	2004-05	251	-3.089
1996-97	203	5.729	2005-06	269	7.171
1997-98	213	4.926	2006-07	273	1.487
1998-99	219	2.817			
Descriptive statistics of number of listed companies	Mean	Standard deviation	Minimum	Maximum	Average growth rate
	217.765	39.006	149.000	273.000	4.421%

Data source: Compiled from different issues of monthly review, DSE.

Figure B: Number of listed companies
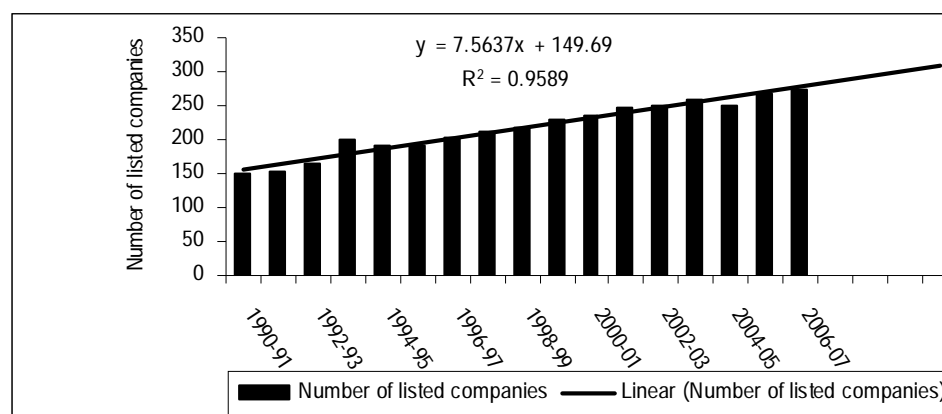
Liquidity Analysts generally use the term "liquidity" to refer to the ability to easily buy and sell securities. A comprehensive measure of liquidity would include all the costs associated with trading, including the time costs and uncertainty of finding a counterpart and settling the trade. As the direct measure of liquidity is beset with complexity, analysts typically use proxy measures of liquidity.

Total value traded/GDP equals total value of shares traded on the stock market divided by GDP. The total value traded ratio measures the organized trading of equities as a share of national output .The total value traded/GDP ratio complements the market capitalization ratio. Together, market capitalization and total value traded/GDP inform us about market size and liquidity. Table 3 shows the liquidity situation of Bangladesh stock market in terms of total value traded to GDP ratio. The ratio has increased form an insignificant number (0.000228) in 1990-91 to 4.05 % in 2006-07. Mean value of 0.015 with a standard deviation of 0.011 for the ratio imply that the increase is not even smooth; there is a marked fluctuation in the value traded to GDP ratio over the years.

Turnover equals the value of total shares traded divided by market capitalization. High turnover is often used as an indicator of high level of liquidity. Turnover also complements total value traded ratio. While total value traded /GDP captures trading compared with the size of the economy, turnover measures trading relative to the size of the stock market. Put it differently, a small, liquid market will have a high turnover ratio but a small total value traded/GDP ratio.

Figure 3 depicts the turnover ratio of the stock market of Bangladesh.. During the study period it increased form 1.1% to 17.5%. The turnover ratio peaked at 62.1% during the year 1998-99 showing a declining trend afterwards. Minimum and maximum ratio of 0.012 and 0.621 during the study period with a mean ratio of 0.215 and standard deviation of 0.192 (table 3) indicate marked fluctuations in the turnover ratio. The linear trend line (figure C) of turnover ratio shows an upward trend though the R^2 of 0.093 indicates a poor model fit.

Table 3: Liquidity measure- total value traded to GDP, 1990-91 to 2006-07

Year	GDP(billion Taka)	Total value traded(billion Taka)	Value traded /GDP	Year	GDP(billion Taka)	Total value traded(billion Taka)	Value traded /GDP
1990-91	834.39	0.19	0.000	1999-00	2370.85	53.2986	0.022
1991-92	906.5	0.12	0.000	2000-01	2535.46	54.6645	0.022
1992-93	948.07	0.44	0.001	2001-02	2732.01	48.571	0.018
1993-94	1030.36	0.58	0.001	2002-03	3005.8	25.8407	0.009
1994-95	1589.76	6.3997	0.004	2003-04	3329.73	70.7324	0.021
1995-96	1663.24	36.222	0.022	2004-05	3707.07	78.8775	0.021
1996-97	1807.07	25.9485	0.014	2005-06	4157.28	57.4001	0.014
1997-98	2001.76	48.4044	0.024	2006-07	4674.97	189.7104	0.041
1998-99	2196.95	50.5023	0.023				
Descriptive statistics	Mean	Standard deviation	Kurtosis	Skewness	Minimum	Maximum	
Value traded to GDP ratio	0.015	0.011	0.024	0.264	0.000	0.041	
Turnover ratio	0.215	0.192	-0.384	0.923	0.012	0.621	

Source: Computed from data of various issues of Bangladesh statistical year book, SEC quarterly review and DSE monthly review

Figure C: Liquidity measure-turnover ratio, **1990-91 to 2006-07**
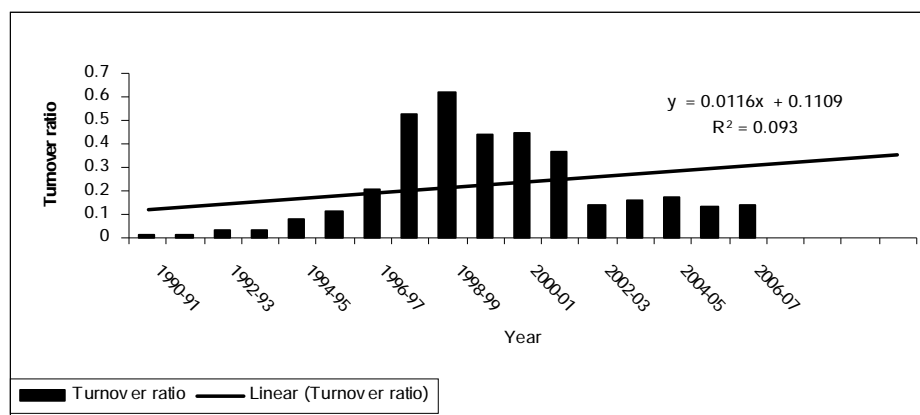
Volatility

Indicators of stock market volatility are a **twelve month standard deviation and coefficient of variation (CV) estimates based on market index**. I include a second measure of volatility that is the difference between the highest and lowest stock market index of the year. I term it as range (this measures of volatility comes from Agarwal, R.N. , 2000).Then I calculate a composite index (rank) of volatility taking the simple average of mean- removed value of standard deviation, CV and range for different year. In my analysis lower rank for volatility means high level of volatility than higher rank for the variable volatility. Thus volatility rank of 1 for a year means the market index was the most volatile during the year. Table 4 depicts the volatility in the Dhaka stock exchange. The range, standard deviation, coefficient of variation and composite volatility ranking for each year during the study period indicate that the market was highly volatile during the study period. Table 4 also shows that the market was the most volatile during the period 1995-96 (rank 1) and 1996-97 (rank 2) which is congruent with the fact that during the year 1996 the capital of Bangladesh experienced a sudden on set of boom and a subsequent burst. However, the decreasing volatility ranks (with volatility index increasing) over the years may be interpreted to mean increasing volatility in stock markets.

Table 4: Volatility in the stock market- range and standard deviation and co-efficient of variation

Year	Standard deviation	Range	CV	Volatility index	Volatility ranking	Year	Standard deviation	Range	CV	Volatility index	Volatility ranking
1990-91	25.383	60.9	0.068	-0.740	15	1999-00	66.557	176.49	0.115	-0.453	9
1991-92	37.628	100.95	0.111	-0.582	12	2000-01	73.273	222.18	0.108	-0.421	8
1992-93	24.849	76.61	0.063	-0.741	16	2001-02	49.392	125.46	0.061	-0.655	14
1993-94	103.587	346.28	0.145	-0.175	5	2002-03	61.364	217.04	0.075	-0.528	11
1994-95	48.571	185.03	0.06	-0.615	13	2003-04	360.654	1017.5	0.262	1.165	3
1995-96	860.964	2289.34	0.592	3.986	1	2004-05	122.742	409.14	0.072	-0.257	6
1996-97	377.758	1212.47	0.344	1.540	2	2005-06	98.097	254.34	0.083	-0.400	7
1997-98	58.270	201.61	0.093	-0.504	10	2006-07	180.645	649.21	0.128	0.181	4
1998-99	21.980	66.24	0.043	-0.802	17						

Data source: Computed form month end index of DSE from 1990-91 to 2006-07 (DSE main board –Monthly review and Graphs)

Concentration

Market concentration can be measured by looking at the share of market capitalization accounted for by the large stocks or large sectors. These large stocks are seen as the leading 3 to 5 firms in the market (Maunder et al. 1991). In many economies only a few companies dominate the stock market (Bundoo 1999). High concentration is not desirable as it can adversely affect liquidity, and it is common to find a negative correlation between concentration and liquidity.

To measure the degree of market concentration, I compute the share of market capitalization accounted for by the ten largest stocks and five largest stocks and call this measure 'concentration'. I also include market capitalization by largest 4 sectors and by the largest sectors, turnover by the largest 4 sectors and by the largest sector.

Figure D indicates increasing market concentration by largest five sectors in Bangladesh stock market. Market capitalization for largest five sectors during the period 1995-96 was 57.50 % which increased to 87.41 % by 2006-07. Figure E points to rather more sectoral concentration in the banking sector market capitalization which rose to 56.16% by 2006-07 from 10.72 % in 1995-96 with an average banking sector concentration growth rate of 16.74% per annum.

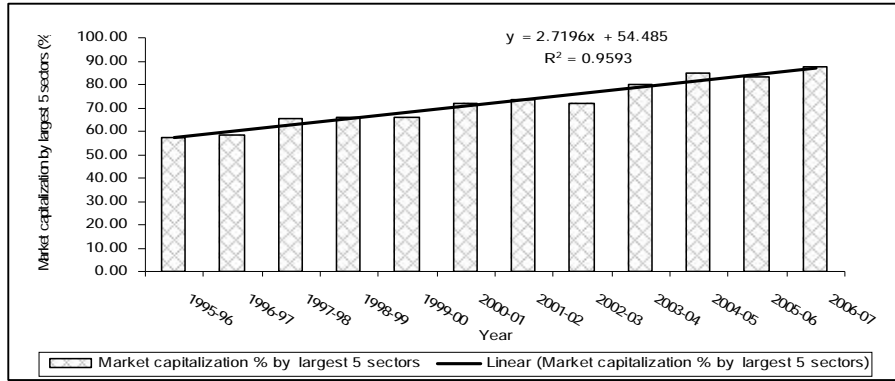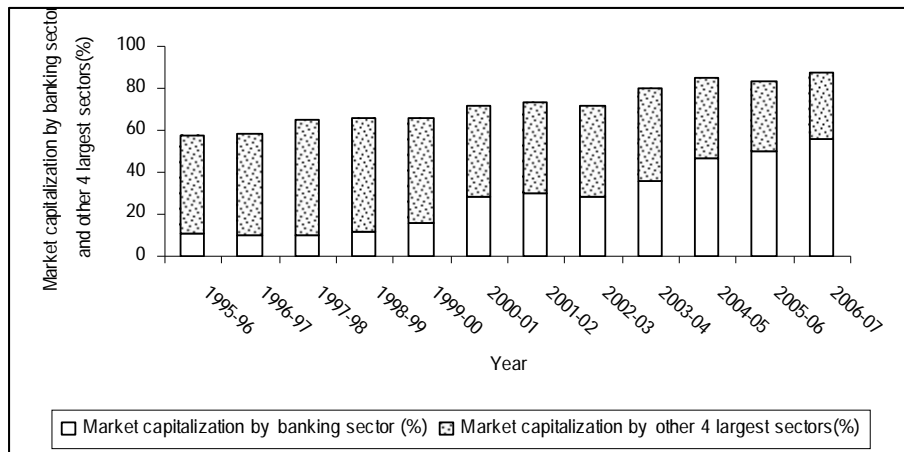**Figure D: Market capitalization by largest five sectors**

Figure E: Increasing Market capitalization by banking sector

Data source: Authors calculations from various issues of Bangladesh Bank Quarterly and Monthly Economic Trends

Figure F shows that capitalization by largest 10 companies during August, 2004 was 45.74% which has decreased to 38.02 % during August, 2007. Market capitalization by the largest 5 companies during the same period has decreased from 34.12 % to 22.37 %.

Figure F: Market Concentration-Market capitalization by large 10 and large 5 companies in DSE
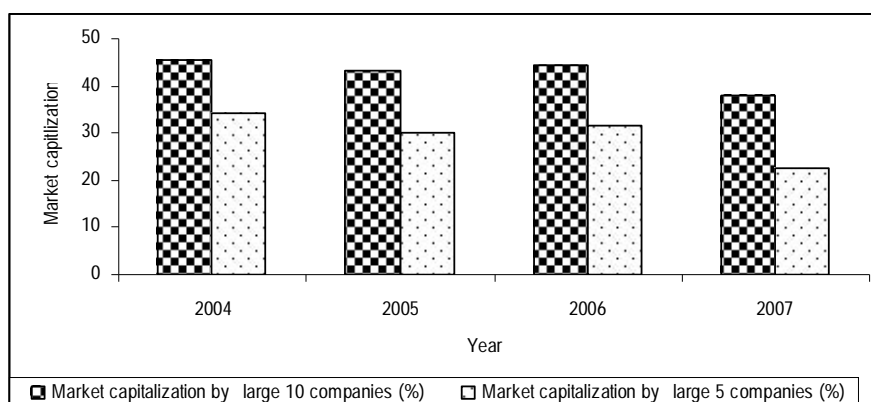
Source: Author's calculation from Dhaka Stock Exchange Main board.

Table 5: Market Concentration: turnover by largest 4 sectors and largest sectors in the DSE.

Concentration measures	2004	2005	2006	2007
Turn over by the largest 4 sectors (%)	77.82	75.88	74.55	81.36
Turnover by the largest sectors (%)(Banks)	49.73	40.4	38.67	48.45

Source: Author's calculation from Dhaka Stock Exchange Main board

Turnover by the largest 4 sectors (table 5) increased from 77.82 % in 2004 to 81.36 % in 2007 whereas, the turnover by the banking sector decreased form 49.73 % in 2004 to 48.45% in 2007. Overall, the Bangladesh stock market   remains highly concentrated to the banking sector in terms of market capitalization and turnover.

Foreign portfolio investment

Foreign portfolio investment in equity and debt securities indicates the level of integration of a stock market with stock market of other countries. It also indicates growth level of a stock market. Bangladesh stock market is showing declining trend in terms of foreign portfolio investment in equity and debt securities. Figure G depicts the foreign portfolio investment situation in Bangladesh stock market for the period of 1992 -93 to 2005-06. From 1992 to 1994-95 purchase of shares by foreign investors exceeded the amount of share sale and repatriation. After 1995-96 the trend reversed and share sale and repatriation exceeded that share purchase for most of the years. During the period of 1995-96 and 1996-97 Bangladesh experienced a massive outflow of foreign investment evidenced by Tk .6.332 billion repatriation and Tk. 6.187 billion sales as against Tk. 0.518 billion share purchases by foreign investors in 1996-97. The declining trend of portfolio investment, evidenced by average annual sales and repatriation of portfolio investment amounting to Tk. 0.995 billion and 1.036 billion per year with standard deviation of 1.603 and 1.636 exceeding the average annual purchase by portfolio investors of Tk. 0.718 billion with a standard deviation of 1.106 during the study period , may be interpreted to mean that Bangladesh stock markets remain non-attractive to foreign portfolio investors.

Figure G: Portfolio Investment : 1992-93 to   2005-06   (in billion Tk.)
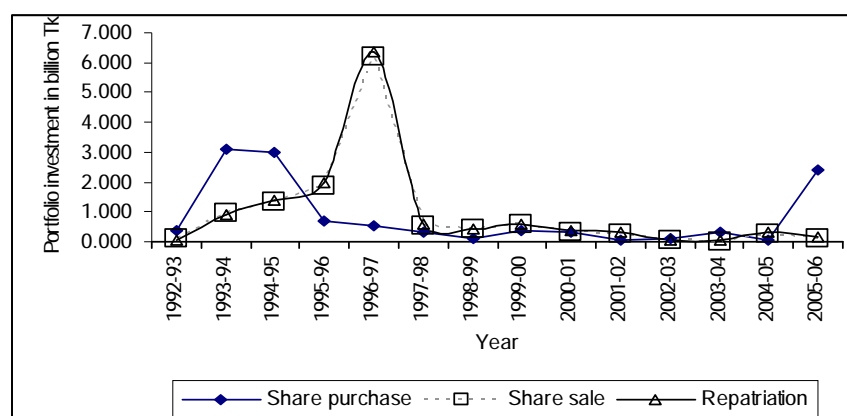
Source: SEC Bangladesh Annual Report 2005-06

Statistical Properties of Key Indicators of Stock Market Development

Table 6 reports correlation matrix among key development indicators of Bangladesh stock market. Market capitalization ratio is significantly correlated to value traded to GDP, number of listed companies and volatility index which may be interpreted to mean that market grows in terms of capitalization as the trading in the market increases, the number of listed companies goes up and market index rise. Value traded to GDP significantly correlated to number of listed companies may be interpreted to mean that market growth in terms of liquidity depends upon market depth in terms of number of listed companies.

Table 6: Correlation matrix among key indicators of stock market development

	Market capitalization to GDP	Value traded to GDP	Turnover ratio	Number of listed companies	Volatility index
Market capitalization to GDP	1	.749*	-.109	.560**	.546**
Value traded to GDP	.746*	1	.566**	.705*	.276
Turnover ratio	-.109	.566**	1	.343	-.181
Number of listed companies	.560**	.705*	.343	1	.002
Volatility index	.546**	.276	-.181	.002	1

*Correlation is significant at 1 % level; **Correlation is significant at 5% level

An Index of Stock Market Development

An index of stock market growth is computed based on the method constructed by Dermirguç – Kunt and Levine (1996), taking into account key market growth indicators viz. market size, liquidity , turnover ratio and volatility, to compute conglomerate indexes of stock market development and average the mean -removed values of particular stock market growth indicators. Specifically, when I construct INDEX-1 - which aggregates information on market capitalization, total value traded/GDP, and turnover ratio, I follow a two-step procedure. First, for each year t and compute the mean-removed market capitalization, total value traded/GDP and turnover ratio. I define the means-removed value of variable X for year t as:

$X(t)^m = [X(t) - mean(X)] / [ABS(mean(X))]$, where ABS refers to the absolute value. For mean (X), I use the average value of X over the   study period.

Second to compute index1, a simple average of mean removed value of market capitalization to GDP, turnover ratio and value traded to GDP is taken. Based on index 1, the stock market is developing over the years. During the periods under study, the stock market was the most developed during 2006-07 and ranked 1. The periods of 1998-99, 1997-98, 1995-96, and 1999-00 ranked second, third, fourth and fifth respectively.

Table 7: Index of stock market development, 1989-90 to 2006-07

Year	Index 1	Rank 1	Index 2	Rank 2	Year	Index 1	Rank 1	Index 2	Rank 2
1990-91	-0.914	6	-0.870	17	1999-00	0.393	5	0.181	8
1991-92	-0.934	7	-0.846	5	2000-01	0.392	6	0.189	7
1992-93	-0.888	5	-0.851	6	2001-02	0.178	9	-0.030	0
1993-94	-0.850	4	-0.681	4	2002-03	-0.316	12	-0.369	2
1994-95	-0.567	3	-0.579	3	2003-04	0.288	7	0.508	3
1995-96	0.487	4	1.362	1	2004-05	0.265	8	0.135	9
1996-97	-0.066	1	0.335	4	2005-06	-0.035	10	-0.126	1
1997-98	0.549	3	0.286	5	2006-07	1.385	1	1.084	2
1998-99	0.632	2	0.273	6					

Figure H|: Index of stock market growth1990-91 to 2006-07
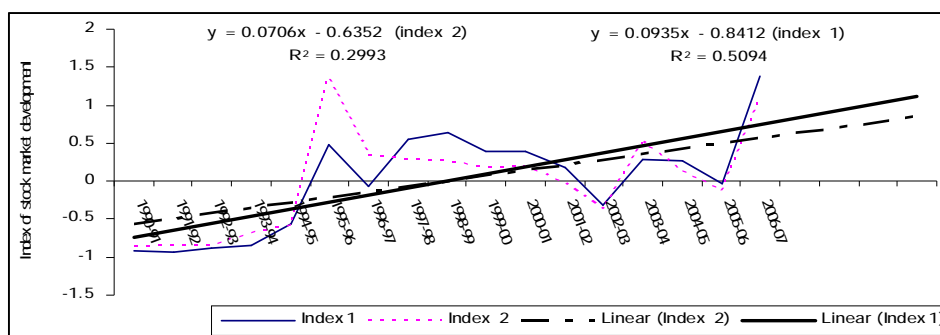
To compute index 2, I include the indicators of market capitalization to GDP, turnover ratio, value traded to GDP and volatility. According to index 2, stock market was the most developed during 1995-96. The periods of 2006-07, 2003-04, 1996-97 and 1997-98 ranked second, third, fourth and fifth respectively. The upward trend line (figure H.) for both index 1 and index 2 may points to the growth of Bangladesh stock market over time, while R^2 value of 0.5094 (index 1) and 0.2993 (index 2) may mean poor fit in the trend line and unstable growth pattern .

Conclusions

I expected at evaluating the growth of Bangladesh stock market over last decade in terms of some commonly used indicators of stock market development. My analysis reveals that the Bangladesh's stock market is growing in terms of market capitalization to GDP, turn over ratio, value traded to GDP and number of listed companies, although the growth over time is not stable and has not yet assumed any obvious pattern. It also remains highly volatile and concentrated with foreign portfolio investment gradually disappearing.

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