RD

Working Paper Series: WP 1304

Integration of Financial Market and Its Implication of Stock Market Development in Bangladesh: An Evaluation

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December 2013

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Integration of Financial Market and Its Implication of Stock Market Development in Bangladesh: An Evaluation[1]

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Abstract

This paper attempts to test for the integration among various segments of the financial market in Bangladesh. Both casual observations and statistical analysis presented in this paper indicate that certain components of the money market such as deposit money banks, nonbank financial institutions and government treasury securities market are highly integrated. The market for the instruments of National Saving Directorate is also integrated, albeit with some sort of divergent tendency due to existence of administered interest rate. On the other hand, the interbank call money market and the stock market are not integrated with the rest of segments of the financial system due to their high volatility in the recent past. Deposit rate of the banks is found to be the "reference rate" for the Bangladesh's financial system. Therefore, efforts must be made to make this rate as much market based as possible since most other rates tend to move in line with the movements of the reference rate. Effectiveness of monetary policy, which generally operates through the short end of the interest rate structure, would also depend on how it impacts the reference rate.

Key words: Integration, financial market, stock market, reference rate.

JEL Classification: E43, E44, G12.

[1] In order to upgrade research capacity and policy analysis at Bangladesh Bank (BB), Research Department conducts research work on macroeconomic issues as a part of its routine activities. The paper reflects research in progress, and as such comments are most welcome (mohammad.masud@bb.org.bd). It is anticipated that the paper will eventually be published in learned journals after completion of the due review process. The views expressed in this paper are those of the authors' own and do not necessarily reflect those of Bangladesh Bank. The authors would like to thank Dr. Ahsan H. Mansur, Executive Director, Policy Research Institute (PRI) of Bangladesh, who provided valuable insights and guided the research study.

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1. Introduction

Financial market has been playing an increasingly important role in the development of Bangladesh. There are many segments of financial market including money market, stock market, bond market, insurance market, foreign exchange market and derivatives market, etc. However, money moves from one segment to another segment of the financial market due mostly to the relative rates of return in different segments. Normally, money goes to the segment in which the rate of return is higher. As long as the rate of return in a particular segment of the financial system is higher, the volume of investment in that segment will continue to grow. If the financial market is integrated, any opportunities for arbitrage will lead to an acceleration of investment in the segment with high rate of return and to a corresponding deceleration of investment in other segments of the financial market. Therefore, the integration of financial market and the consequent reduced opportunities for arbitrage are essential for stabilizing the flow of funds to different segments of the financial market promptly and efficiently. The integration of financial market is important for healthy and balanced growth of all the major components/pillars of the financial system and allows market participants to realize broadly similar rates of returns after allowing for risk and tenor in different segments of financial market.

The financial market in Bangladesh consists mainly of money market, stock market, bond market, insurance market, foreign exchange market and micro-financial market. Banks and nonbank financial institutions are primarily involved in money market. Banks play a major role in the financial market of Bangladesh. The capital market is now the second largest segment of financial system. Investment in the saving instruments issued by National Saving Directorate (NSD) is the third largest segment of the financial market of the country.

In recent years, the capital market in Bangladesh has grown much faster than the other segment of the financial market. The development in capital market was initially driven by stronger

economic fundamentals relative to valuation of stocks and thereafter it was pushed by speculative forces taking market capitalization to unprecedented levels. This development negatively impacted on investments in other segments of financial market i.e. money market and investment in NSD saving instruments. During the periods of boom in the stock market, the rates of interest on bank deposits and NSD saving instruments were fixed, which played an important role in diverting investment funds to the stock market. Diversion of investment funds helped to cause over-valuation and excessive growth in the market capitalization of securities listed in both Dhaka and Chittagong stock exchanges. Ultimately, the stock price indices tumbled due to economic fundamentals and as the flow of funds to the stock market dried up.

The objective of this paper is to focus on the degree of integration of the financial market in Bangladesh and identify the "reference rate" for the Bangladesh's financial system. The paper tries to determine the co-integrating relationship between the different segments of financial markets in Bangladesh.

After reviewing the literature in the second section, we discuss the characteristics of the financial market in Bangladesh in the third. In the fourth section, we analyze the issue of market integration in the context of Bangladesh's financial market. We explain methodology and sixth sections model specification in the fifth section and the analysis of empirical findings in the sixth. The concluding observations and some policy recommendations are presented in the final section.

2. Literature Review

According to Baele et. al (2004), the definition of an integrated financial market is a market for a defined set of financial instruments if all the potential market participants, with the same relevant characteristics, (1) face a single set of rules when they decide to deal with those financial instruments and/or services; (2) have equal access to the above-mentioned set of financial instruments and/or services; and (3) are treated equally when they are active in the market.

This definition of financial integration contains three important features: First, it is independent of all the financial structures within the region. These financial structures cover issues like

defining the scope of all financial intermediaries and importantly the dynamics and interplay between these financial intermediaries with regard to the flow of funds from households, corporate entities and the government. Second, friction in the process of intermediation i.e. access to capital either through institutions or markets can persist after financial integration is completed. This implies that the essential objective behind financial integration is not removing these frictions, which hampers the optimal allocation of capital, but rather is concerned with the symmetric and asymmetric effects of such frictions on different areas. Thus, even in the presence of such frictions, several areas may be considered integrated as long as these frictions come to affect symmetrically (Baele et al., 2004).

Third, according to the definition advocated by Baele et al. (2004), the constituents of the financial market can be cleaved in two parts - being the supply of and the demand for investment opportunities. Accordingly, full integration entails the same access to banks or trading, clearing and settlement platforms for both investors (demand for investment opportunities) and firms (supply of investment opportunities, e.g. listings), regardless of their region of origin. Furthermore, once access has been granted, full integration requires that no discrimination should exist among comparable market participants based solely on their location of origin (Baele et al., 2004).

According to the same authors, there are three benefits to be derived from financial integration: more opportunities for risk sharing and diversification; more and efficient allocation of capital among investment opportunities; and potential for higher growth. Accordingly, these three benefits are inter-related, as it has been shown earlier in literature that sharing risk across regions enhances specialization in production (Baele et al. 2004; Kalemli-Ozcan et al. 2001). Similarly financial integration should lead to an increase in fund flows for investment opportunities in specific regions as should be the case when financial integration helps facilitate the access to investment opportunities in those regions (Baele et al., 2004).

Hamilton et al. (2005) claimed that while deregulation and technological change have unleashed tremendous competitive forces on the global financial system in recent years, resulting in enormous growth and innovation in the provision of financial services, which in turn have

provided substantial benefits to the wider economy by providing households and corporations a much wider menu of instruments with which to borrow. At the same time, the expansion of choice horizon as well as exposure to new risks has increased premium on high quality financial advice and knowledge.

In the context of the subcontinent, though, it may be said that there is a lot of scope for applicability of financial market integration. With respect to Bangladesh, the financial sector industry is highly fragmented, with limited degree of overlap between the formal, semi-formal and informal markets for credit, savings, insurance and various other non-bank financial services such as lease financing, mutual funds and mortgages (South Asian Network of Microfinance Initiatives, 1998). Accordingly, efficient market intermediation here is constrained by two crucial barriers- institutional and policy environment. The institutional rigidities in place serve to constrain the operating and implementing effectiveness while an almost obsolescent legal and regulatory framework also poses considerable barriers to market integration. Importantly asymmetry regarding knowledge of information may be cited as a crucial factor (South Asian Network of Microfinance Initiatives, 1998).

Using a derived methodology Mohsin and Qayyum in 2005 tested empirically for the degree of financial market integration in 5 countries of South Asia separately. In summary, the authors were able to rule out the null hypothesis of perfect capital mobility for all South Asian countries, while only during the 1990s there were evidence of some degree of capital mobility in Bangladesh and Nepal. According to the authors' estimates, India possessed the lowest degree of financial integration, while Bangladesh fell in between other countries.

Bhoi and Dal (1998) also attempted a study of financial integration on an empirical basis for India, and found that several segments of the financial market had achieved operational efficiency. India's financial markets were getting increasingly integrated at the short-end of the market, such as, money market, credit market, government securities market since April 1993. However, capital market was least integrated with the rest of the financial sector (Bhoi and Dhal, 1998). Thus their study regarding convergence of key financial markets yielded only mixed results, since evidence for convergence was observed only for short term markets.

In another study, Jain and Bhanumurthy (2005) also looked into the issue of financial integration in India. According to the authors, there appeared to be a long run relationship, or convergence (as discovered by the authors in the form of cointegration) amongst the call money rate, exchange rate and London Inter-Bank Offered Rate (LIBOR), which implied presence of a common stochastic trend between domestic and foreign market returns, and it was seen to be strengthening over time. However, the authors also warned that the financial reform programme (in the form of modifying policy and institutional infrastructure), must go in tandem with financial integration to reap the rewards properly.

Jena (2002) examined the degree of market integration empirically and attempted to provide some evidence on the market integration in India. He found that while the reform process had helped to remove institutional bottlenecks to the free flow of capital across various segments of the financial market; this had not yet been translated into complete integration among them.

From the above studies it may be observed that the concept of integration of financial market has a wide range of dimensions- regional, domestic, international, etc. The paper will follow integration concept expressed in the studies by Jain and Bhanumurthy (2005) and Jena (2002) to examine integration of domestic financial market in Bangladesh.

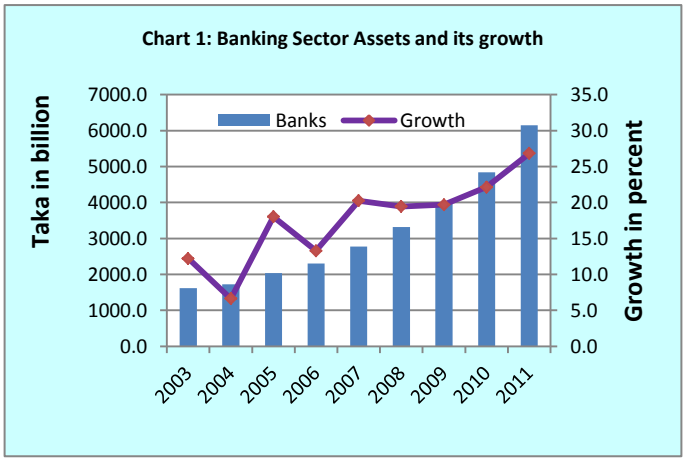
3. Characteristics of the Bangladesh Financial Market

The financial market of Bangladesh mainly consists of money market actively participated by banks and non-bank financial institutions (NBFIs), government bond markets including NSD, insurance market, and capital market.

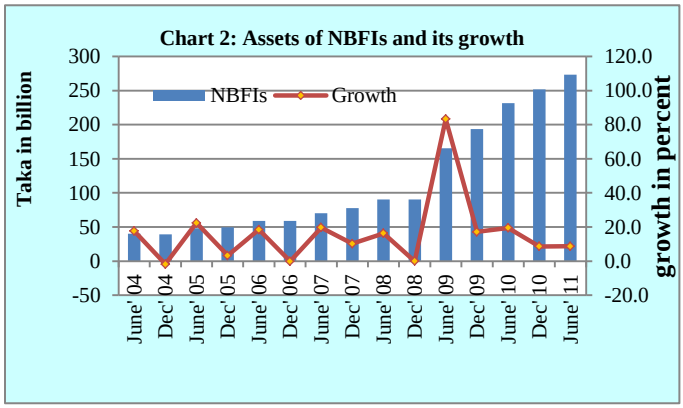
3.1 Money Market

Banking sector is the dominant player in the money market of Bangladesh. This sector is developing under full control and supervision of Bangladesh Bank (BB), the central bank of the country. At present there are 47 scheduled banks operating in Bangladesh of which 4 are state-owned commercial banks (SCBs), 4 are government-owned specialized banks (SBs), 30 are domestic private commercial banks (PCBs) including 7 Islamic banks and 9 are foreign commercial banks (FCBs). The major source of funds of banks is collecting deposits in the form of demand and time deposits from the public.

In recent years, though assets of the banking system has been growing, its share in the total assets of the financial system has been falling due to the growth of other segments of the financial market of Bangladesh mainly the capital market. In 2003, the share of banks' assets in the total assets of financial sector was 60%, which decreased to 51.2 % in 2011. The trends in the assets of banking sector and its growth are shown in Chart-1. Non-bank financial institutions (NBFIs) also takes part in money market but its role in the money market is insignificant as compared to the banking sector. The number of NBFIs has been growing under the supervision of Bangladesh Bank. At present there are 31 NBFIs of which two are fully government owned, one is a subsidiary of an SCB, 13 are initiated by domestic private and 15 are initiated by joint venture. Major sources of funds of the NBFIs are term deposits (at least six months tenure), credit facilities from banks and call money as well as bond and securitization.

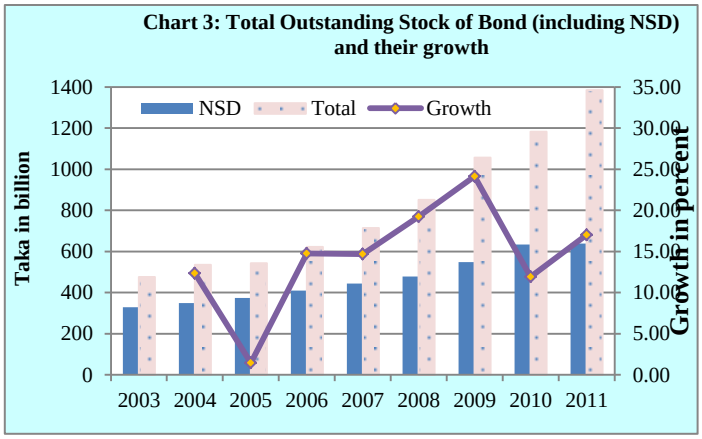


Both the assets of NBFIs and its share in the total assets of the financial system has been increasing in recent years, but at times its growth is retarded by the growths of other segments of the financial market of Bangladesh mainly by the capital market. The share of NBFIs in the total assets of financial sector was 1.4% in 2003, which increased to 2.7% in 2011. The trends in the assets of NBFIs and its growth are shown in Chart-2.



3.2 Government bond market

Government issued various types of bonds of different tenures for long term financing of its deficits, mainly from banks and NBFIs. Besides, for financing the budget deficit, government issued different saving instruments through National Saving Directorate (NSD). NSD instruments are sold to the household and collection of money from the sales of such instruments depends mainly on the rates of interest offered by these instruments. If interest rates on NSD instruments are lower than the return on the instruments of other segment of financial market, government's collection of money from sales of NSD instruments falls.

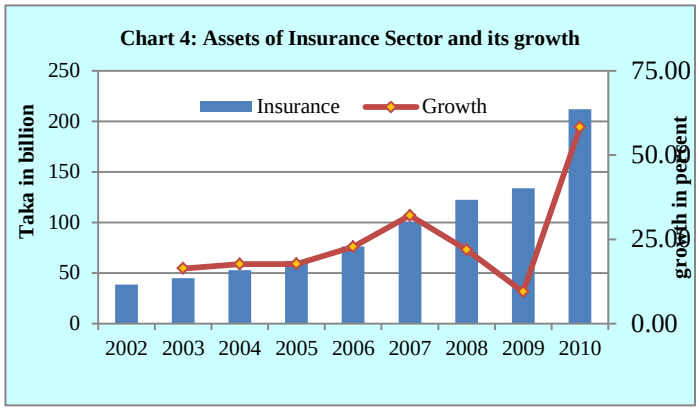


In recent years, the outstanding amount of bonds and NSD instruments has been growing, but its share in the total assets of the financial system has been decreasing. Since the government sells NSD instruments on an open window basis, return on the instruments in other segments of the financial market basically interest rates offered by banks and NBFIs or gain from stocks influences the household demand for NSD instruments. In 2003, the share of the outstanding amount of bonds and NSD instruments in the total assets of the financial sector was 32.8% which steadily decreased to 19.2% by 2011 due mainly to the decrease in sales of NSD instruments. The trends in the outstanding amount of bonds and NSD instruments and their growth are shown in Chart-3.

3.3 Insurance Market

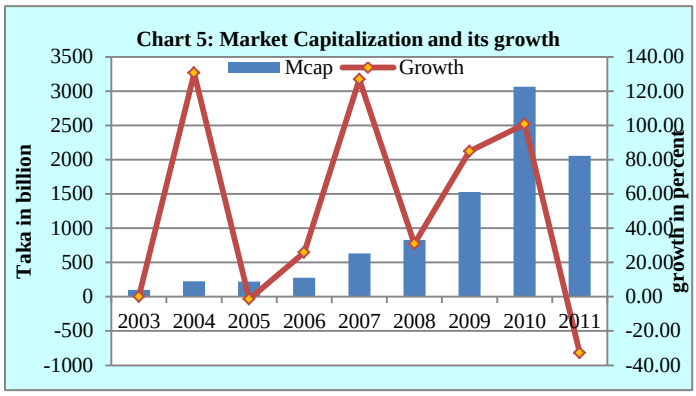
A total of 62 insurance companies have been operating in Bangladesh, of which 18 provide life insurance and 44 are in the general insurance field. Among the life insurance companies, except the state-owned Jiban Bima Corporation (JBC) and a foreign-owned American Life Insurance Company (ALICO), the rest are domestic private entities. Among the general insurance companies, state-owned Shadharan Bima Corporation (SBC) is the most active in the insurance sector. The major source of fund of insurance companies is collecting insurance premium.

The insurance market in Bangladesh has been remained insignificant on the basis of its relatively small asset size. However, both the assets of insurance companies and its share in the total assets of the financial system has been increasing in recent years. But sometimes the growth of assets of insurance companies becomes stronger with growth of the capital market because a large gain from stocks can build a hand-sum premium easily. The share of insurance companies in the total assets of financial sector was 1.83% in 2003, which increased to 2.17% in 2011. The trends in the assets of NBFIs and its growth are shown in Chart-4.



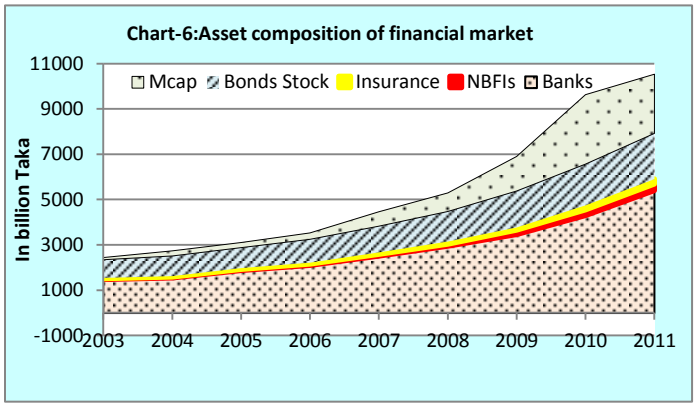
3.4 Capital Market

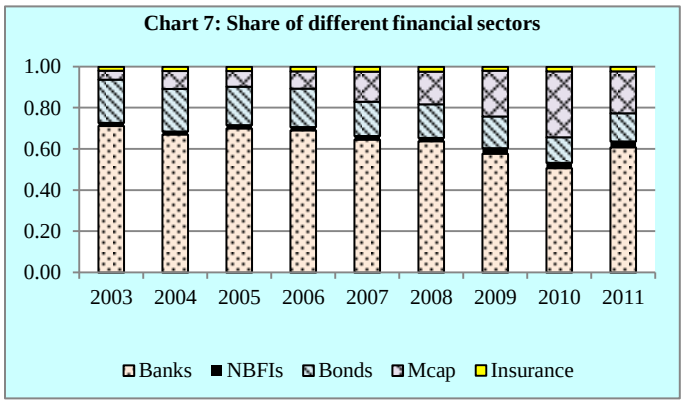
The capital market consists of two stock exchange companies-Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE). These two stock exchanges are regulated by the Securities and Exchange Commission (SEC). Recently capital market has flourished noticeably due to stronger economic fundamentals of the listed companies, various measures by its regulator SEC and opportunity of gaining more returns from holding stocks. Both market capitalisation of all shares listed in DSE and its share in total assets of the financial sector increased remarkably. In 2003, stock market capitalization accounted for only 4% of the total assets of the financial system, which increased sharply to 24.7% by 2011 despite a major downward market correction in 2011. Market capitalization of the stock market reached 31.8% of the total financial sector in 2010, when the capital market passed through a bubble phase. The trends in market capitalization and its growth are shown in Chart-5.



3.5 Comparison of different segments of financial market

There is no doubt the financial market in Bangladesh has been growing steadily. However, the asset composition of different segment of financial market is changing over the years. In recent years the capital market in Bangladesh has grown faster than other segments of the financial market. Yet, assets in the money market (namely assets of the banks) still remained the highest and dominant in the financial market. Capital market and government bond market remained in second and third positions in terms of asset size. The trends in asset composition and the relative shares of different segments of the financial market are shown in Chart-6 and Chart-7, respectively.



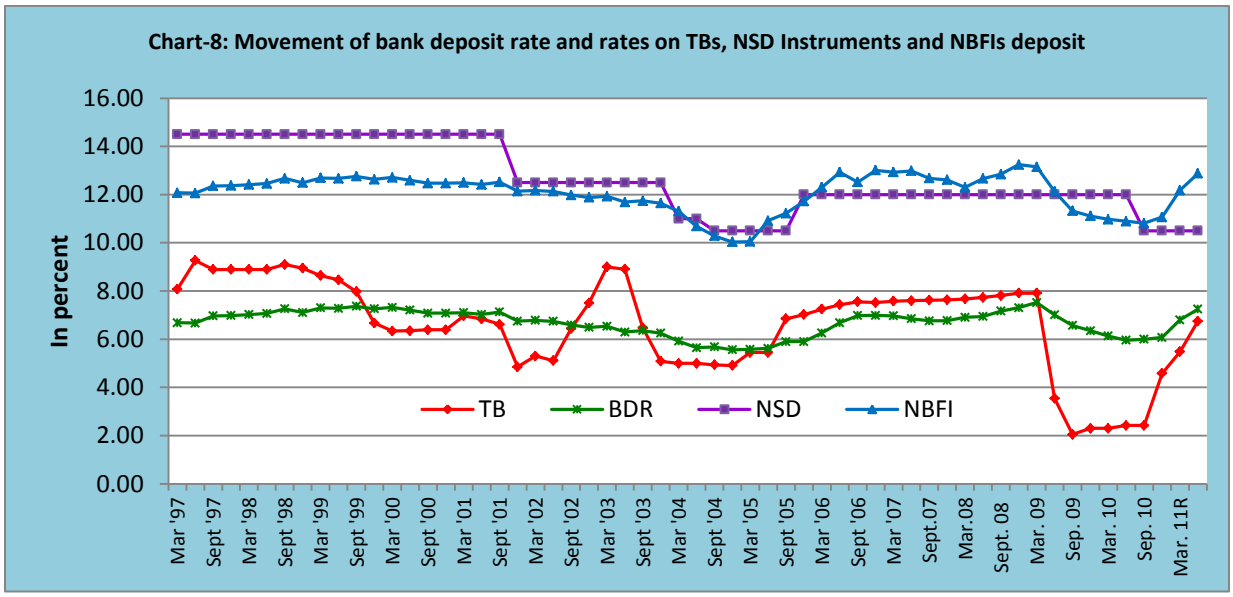


4. Integration of Financial Market in Bangladesh

Integration of different segments of the financial market is revealed on the trends of rates of return on investments in different segments. The various rates of return of different segments of the financial market reveal the variations of risk and return in each segment of the market, after taking into account the maturity structure of the financial instruments. A difference in rates of returns between two segments of the financial market creates arbitrage opportunities. In an integrated financial market, investible funds move from one segment of the financial market to another unless arbitrage possibilities are removed or disappeared.

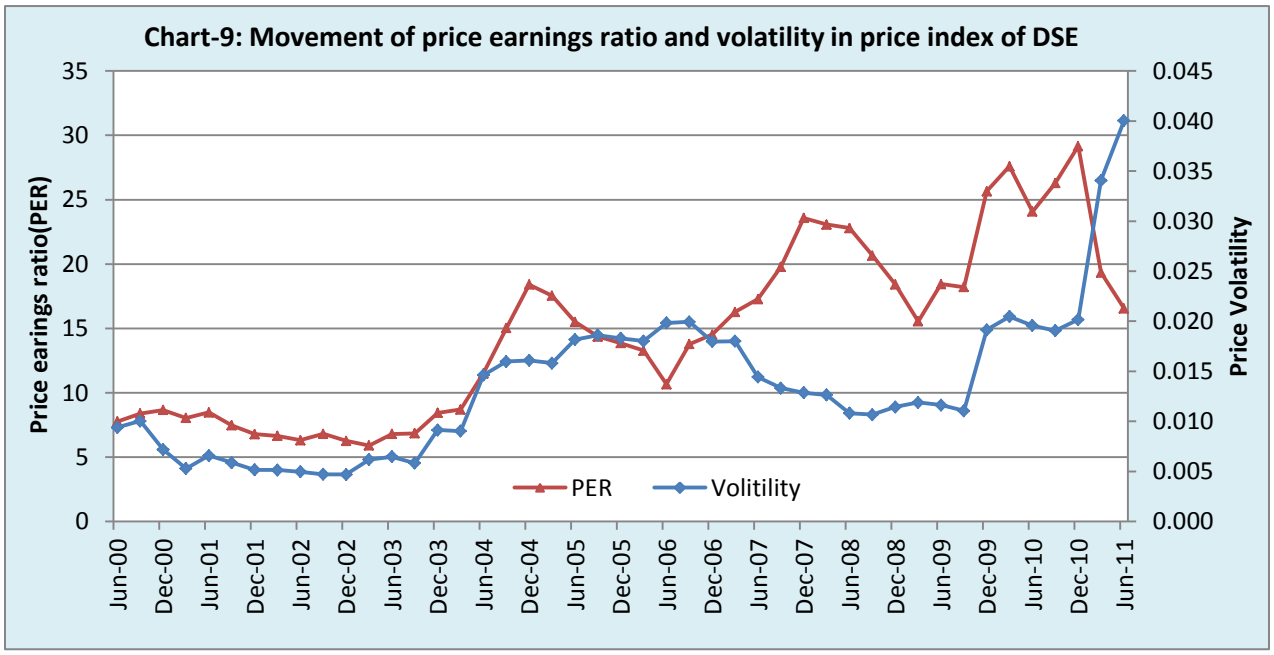
In Bangladesh, different rates of return in different segments of financial market reflect risk and maturity; therefore, the movements of rates of returns are different. The differences in interest rates on deposits both in bank and non-bank financial institutions, yields on treasury bills and

interest rates on investment in the instruments of National Savings Directorate (NSD) reveals primarily the differences in the maturity structure of these financial instruments. The movements of interest rates on bank deposits (BDR), interest rates on deposits of non-bank financial institutions (NBFIs), yields on treasury bills (TB) and interest rates on NSD instruments are shown in Chart-8.

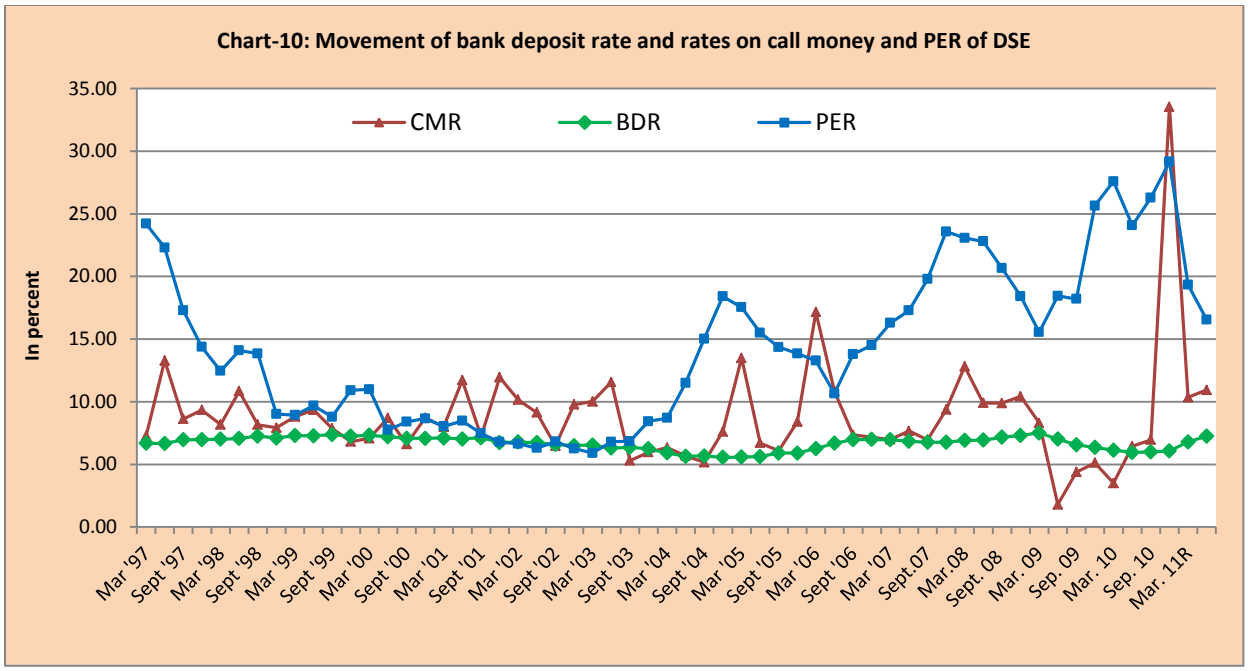


In Chart-8, it is observed that trends in interest rates on both the deposits of banks and non-bank financial instruments are very similar. The gap between the two rates at any single point in time reflects primarily the difference in maturity. Deposits in banks are kept for both shorter and longer maturity periods, but those in non-bank financial institutions are allowed for only longer time. Accordingly, the deposit rate of non-bank financial institutions is higher than that of banks. Since interest rates on NSD instruments are administered, its movement is not smooth. But interest rates on both deposits of non-bank financial institution and NSD instruments are alike, because both deposit rates refer to longer periods. Trends in the yield rate on 91-day treasury bill and bank deposit rate are also similar in except some variations in 2003, 2009 and 2010. Since there is no risk factor in investing money in different types of deposits, treasury bills and NSD instruments, these segments of financial market are stable. Furthermore, since there is scope of arbitrage opportunity, but there is no significant volatility in these segments of money market.

On the other hand, the returns from inter-bank call money market and stock market involve both maturity and risk factors. Therefore, the movements of rates of returns on interbank money transactions and equities in the stock market are volatile because of involvement of risks on transactions in such segments of financial market. The volatility in price index as measured by 3-year moving variance of quarterly growth in price index and price earnings ratio (PER) of DSE is shown in chart-9. It has been observed that there is positive correlation between price earnings ratio and volatility in price of stock.



The trends in interest rates on interbank money market transactions (CMR) and price earnings ratio of stocks listed in Dhaka Stock Exchange (DSE) are shown in Chart-10 along with the bank deposit rate.



It is observed that the movements in the average rate of return from the call money market and the stock market are indeed quite volatile. More interestingly it is found that, a somewhat positive relationship may be found between the rate of return in the call money market and the PER. In addition, the trends in rates of returns from the call money market and stock market remain generally higher than the rate of return from a stable segment of money market i.e. bank deposits.

The trends in the rates of returns among different segments of the financial market also manifested through correlations among them. The pair-wise correlation coefficients of different rates of returns are shown in Table-1.

Table 1: Correlation Matrix of Returns from Different Markets

Variables	TB	PER	NSD	NBFI	CMR	BDR
TB	1					
PER	-0.31	1				
NSD	0.5	-0.4	1			
NBFIS	0.64	-0.25	0.54	1		
CMR	0.19	0.18	-0.1	0.02	1	
BDR	0.52	-0.23	0.67	0.91	-0.03	1

TB= yield rate on 91-treasury bill, PER = price earnings ratio of stocks listed in DSE, NSD = interest rate on the instruments of NSD, NBFI =interest rate on deposits held in non-bank financial institutions, CMR= interest rate on interbank call money transactions and BDR= bank deposit rate.

Table-1 shows that the bank deposit rate is well-correlated with the rates of returns in other segments of the financial market. In particular, the bank deposit rate is highly and positively correlated with rate of interest on deposits held by NBFIs. It is also directly correlated with the interest rate on NDS instruments and the yield on treasury bills. However, bank deposit rate is weakly and negatively correlated with the rate of return on stock and the interest rate on money at call.

On the viewpoint of correlations among different rates of return on the investments in various segments of the financial market, the bank deposit rate may be considered as a reference rate-the rate with which other rates of returns tend to covariate-in order to postulate that the various segments of the financial sector are integrated.

It is mentionable here that during 2001 to 2008, the capital market in Bangladesh has grown markedly and independently due to the attraction of higher rate of return i.e. PER increasing at a much faster rate than the rate of return from any other segment of the financial market. In particular, in the year 2009 and 2010 the growth of market capitalization was excessive due to speculative pressures, excess liquidity expansion, and a downward trend in the rates of return from other segments of the financial market. These developments opened up the opportunity for arbitrage through diverting of liquidity from other market to the stock market. The Speculative bubble that was formed the process could not be sustained and the resulting stock market correction led to a reduction in the market capitalization in 2011.

5. Methodology and Model Specification

The paper will use econometric methods to find out the reference rate by using measures of the skewness and kurtosis of first difference series to satisfy the normality assumptions. In order to examine the issue of integration within the financial market, we need to see the cointegration relationship among the rates of return from different segments of the financial market. In this context, we first examine the stationarity properties of the variables by using Phillips-Perron test. After checking for the stationarity, we examine whether the short-run and long run rates of returns are cointegrated by using the Johansen un-restricted cointegration test for series BDR, TB, NBFI, NSD, PER and CMR. Afterwards, we estimate the normalized cointegration equation for the bank deposit rate as follows:

$$BDR = a\,TB + b\,NBFI + c\,NSD + d\,PER + e\,CMR + u$$

Where, BDR = bank deposit rate

TB = yield rate on 91-treasury bill

NBFI = interest rate on deposits held in non-bank financial institutions

NSD = interest rate on the instruments of NSD

PER = price earnings ratio of stocks listed in DSE

CMR= interest rate on interbank call money transactions

u = error term

Finally, we use a vector error correction framework to measure the speed of adjustment.

6. Analysis of Empirical Findings

With a view to identifying whether any of the rates of returns has the prospect to serve as a reference rate, the basic statistics of these rates in their first difference form have been calculated and shown in Table 2. The skewness and kurtosis measures of the first difference series indicate that none of the series could satisfy the normality assumption viz. zero skewness and excess kurtosis equals to zero. But considering both skewness and excess kurtosis, BDR satisfied normality assumption better than other variables. Therefore, BDR is regarded as the 'reference rate' for the Bangladesh's financial market.

Table 2: Basic statistics of return from different market (first difference).

Variables	Mean	Variance	Skewness	Excess Kurtosis	Jarque-Bera Stat
BDR	0.01	0.05	0.44	1.39	6.46
CMR	0.06	31.60	0.61	11.63	324.77
NBFIS	0.01	0.14	0.29	1.51	6.20
NSD	-0.07	0.19	-1.98	11.06	327.92
PER	-0.13	6.87	-0.50	2.70	19.70

To examine the co-integration the first step is to test the stationarity properties of the variables in the time series. Among the different tests for stationarity, we have used Phillips-Perron test for

this study[2]. The results of the Phillips-Perron test are provided in Table 3. The Phillips-Perron test shows that only CMR does not have a unit root in levels. All other variables have unit root in levels and thus are non-stationary. However, due to high volatility of CMR, a 2-quarter moving average series of CMR (CMR2) is considered. This variable is now found non-stationary in level. Then, unit root test is conducted in first differences. All the series satisfied stationarity or, in other words, they are all I (1) process.

Table-3: Estimated z-statistic values for Philips-Perron test

Variables	Level form		First difference form	
	Without trend	With Trend	Without trend	With Trend
CMR	-6.53*	-6.48*	-39.44*	-47.65*
BDR	-1.95	-1.91	-4.42*	-4.40*
NBFIs	-2.28	-2.24	-4.30*	-4.27*
NSD	-1.03	-2.05	-7.55*	-7.48*
PER	-2.13	-3.36	-6.13*	-6.18*
TB	-2.25	-2.49	-5.19*	-5.17*
CMR2	-1.97	-1.47	-5.92*	-6.07*

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

The results of Johansen unrestricted cointegration rank test for series BDR, TB, NBFI, NSD, PER and CMR are summarized in table-4.

Table 4: Johansen Un-restricted Co-integration Rank Test for Series: BDR, TB, NBFI, NSD, PER and CMR2

Null Hypothesis	Alternative Hypothesis	Test Statistics	5 percent Critical value	Conclusion
Trace Test				
r=0	r>0	128.32	94.15	One co-integrating equation at 0.05 level
r ≤1	r >1	61.7	68.52	
r≤2	r>3	38.87	47.21	
Maximum Eigen value Test				
r=0	r>0	66.62	39.37	One co-integrating equation at 0.05 level

[2] Other important tests for stationarity are DF and ADF tests. The test statistic proposed by Phillips and Perron termed as z-statistic, arises from their consideration of the limiting distributions of the Dickey-Fuller statistic, when the assumption of i.i.d. process for the disturbance term is relaxed. Further, the error term could be serially correlated and heterogeneous.

Both the trace and maximum eigen value suggest one cointegrating relation among the six variables indicating the long-run relationship in the system. Estimated normalized co-integration equation of bank deposit rate is shown in equation (1) and standard error is reported in parentheses.

BDR = 0.07 TB + 0.20 NBFI + 0.31 NSD + 0.05 PER + 0.29 CMR ……..(1)

S.E. (0.05) (0.12) (0.06) (0.01) (0.03)

In the model, it is found that yield rate on treasury bill, deposit rate by NBFI, interest rate on NSD instruments, CMR2 and price earnings ratio of DSE have positively influences on BDR.

The estimated adjustment coefficient of α for bank deposit rate (BDR) model is reported in table-5. The speed of adjustment coefficient measures the degree to which the variable in equation responds to the deviation from the long equilibrium relationship. For example, the bank deposit rate is correcting about 14 percent every quarter to move long run equilibrium relation.

Table-5 : Adjustment Coefficient of α

Variable	α	Standard error
Δ BDR	-0.14	0.03
ΔTB	-0.018	0.19
ΔNBFI	-0.15	0.06
ΔNSD	0.04	0.09
ΔPER	1.94	0.46
ΔCMR2	2.98	0.98

Moreover the speed of adjustment of yield rate on Treasury bill and deposit rate by NBFI are convergent towards the long-run equilibrium because they are highly integrated to the reference rate. On the other hand, short term dynamics reveal that call money rate and the price earnings ratio of DSE is divergent to the reference rate due to high volatility. In addition, the interest rate of NSD instrument is some sort of divergent from the reference rate perhaps because interest rate on these instruments is not determined by market forces.

7. Conclusion and Recommendations

An attempt had been made in this paper to test for the integration among various segments of the financial market in Bangladesh. Both casual observations and statistical analysis presented in this paper indicate that certain components of the money market such as deposit money banks, nonbank financial institutions and government treasury securities market are highly integrated. The market for the instruments of National Saving Directorate is also integrated to the above three segments of the money market, albeit with some sort of divergent tendency due to existence of administered interest rate. On the other hand, the call money market and the stock market are not integrated with the rest of the financial system due to their high volatility in the recent past.

The apparent lack of integration of the stock market and the call money market with the rest of the financial sector may be more attributable to the specific characteristics of these two markets, including the nature of the associated instruments and the associated volatility. The high volatility in the stock and call money markets may be a reflection of the associated risks in these instruments. Accordingly, a proper assessment of the degree of integration with other segments of the financial system should be on the basis of risk adjusted/weighted rates of returns instead of simple comparisons among the rates of returns in different market segments. For instance, as market volatility increases, the rate of return in the stock market also increases with the associated risk, independent of the developments in the interest rate structure of deposit money banks. This kind of analysis should certainly be done in the context of another follow up study.

Deposit rate of the banks is found to be the "Reference Rate" for the Bangladesh financial system. Thus efforts must be made to make this rate as much market based as possible since most other rates tend to move in line with the movements of the reference rate. Effectiveness of monetary policy, which generally operates through the short end of the interest rate structure, would also depend on how it impacts the reference rate. But there found a long-run relationship among different segments of financial market. Though short term dynamics reveal that market for the instrument of National Saving Directorate, call money market and stock market are divergent from the mainstream money market, yet corrective measures could bring these segments of financial market towards the path of integration in the long-run.

References:

Adler, and Dumas, B., 1983, 'International Portfolio Choice and Corporation Finance: A Synthesis', Journal of Finance 38, 925-984.

Aliber, R., 1978, 'Integration of National Financial Markets', Review of World Economics 9, 26-35.

Ananthakrishnan, V., 1987, 'Foreign Exchange Market of India: Structure and Functioning', Journal of Foreign Exchange and International Finance 2, 169-76.

__, 1994, 'Foreign Exchange Market of India', Journal of Foreign Exchange and International Finance 7, 394-99.

Baele, L. Ferrando, A. Hordahl, P. Krylova, and E. Monnet, C. (2004). 'Measuring Financial Integration in Euro Area,' Occasional Paper Series, European Central Bank. No. 14.

Bencivenga, V. and Smith, B., 1991, 'Financial Intermediation and Endogenous Growth', Review of Economic Studies 58, 195–209.

Bhoi, B. K. and Dhal, S. C. 'Integration of Financial Markets in India: An Empirical Anakysis'. Accessed from: 'www.unescap.org/pdd/publications/apdj_12_2/jain.pdf'

Bhole, L. M., 1999, Financial Institutions and Markets, Bombay: Himalaya Publishing House.

Cole, D.C., Hall, S.S., and Phillips, A.W., 1995, Asian Money Market, Oxford: Oxford University Press.

Engle, R.E. and Granger, C.W.J., 1987, 'Cointegration and Error-Correction: Representation, Estimation, and Testing, Econometrica 55, 251-76

Gopala Rao, P.R., 2000, 'Current Developments in Money and Government Securities Markets', RBI Bulletin, September, 939-44.

Greenwood, J. and Jovanovic, B., 1990, 'Financial Development, Growth, and the Distribution of Income', Journal of Political Economy 98, 1076–1107.

Greenwood, J. and Smith, B., 1993, 'Financial Markets in Development and the Development of Financial Markets', Journal of Economic Dynamics and Control,

Hamilton, R. Jenkinson, N. Penalver, A. 'Innovation and Integration in Financial Markets and the Implications for Financial Stability'. Accessed from 'http://www.rba.gov.au/publications/confs/2007/hamilton-jenkinson-penalver.pdf'

Jain, S. and Bhanumurthy, N. R. (2005). 'Financial Markets Integration in India,' Asia Pacific Development Journal. Vol 12 N0. 2

Jena, P.R., 2002, Integration of Financial Markets in India: An Empirical Analysis, Unpublished M.Phil dissertation, University of Hyderabad.

Johansen, S. and Juselius, K., 1990, 'Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money',Oxford Bulletin of Economics and Statistics 52, 169-209

Johansen, S., 1988, 'Statistical Analysis of Cointegration Vectors', Journal of Economic Dynamics and Control, 231-54

McKinnon, R.I., 1973, Money and Capital in Economic Development, Washington D.C.: The Brookings Institution.

Mohsin, H.M. andQayyum, A. (2005). The Integration of Financial Markets: Empirical Evidence fromSouth Asian Countries. Accessed from: 'http://mpra.ub.uni-muenchen.de/2364/'

Nag, A.K. and Mitra, A., 1999, 'Integration of Financial Markets in India: An Empirical Investigation, Prajnan 3,

Pattanaik, I. and Vasudevan, D., 1999, Integration of Money Markets: evidence from Interest Rates, A project report sponsored by the Canadian International evelopment Agency (CIDA) and the Industrial Credit and Investment Corporation of India (ICICI).

Rangarajan, C., 1994, 'Indian Financial System: The Emerging Horizon, RBI Bulletin, June, 747-58.

Reddy, Y.V., 1999, 'Development in Foreign Exchange Market: Indian Experience', RBI Bulletin, October, 1173-83.

___, Y.V., 1999, 'Financial Sector Reform: Review and Prospects', RBI Bulletin, January, 33-43.

Reserve Bank of India, 1985, Report of the Committee to Review the Working of the Monetary System (Chairman, S. Chakravarty).

Ross, L., 1992, 'Financial Structure and Economic Development', Working Paper WPS 849, The World Bank, February.

___, 1997, 'Financial Development and Economic Growth', Journal of Economic Literature 2, .

Shaw, E., 1973, Financial Developing in Economic Development, New York: Oxford University Press.

South Asian Network, 'Integrating Financial Markets: A Framework for Viable Increasing Microfinance Outreach in Bangladesh,' South Asian Network of Microfinance Initiatives, 1998.

Tayebi, S. K.andFakhr, Z.S. 'Determinants of Financial Integration in the East Asia-Pacif Region,' Department of Economics, University of Isfahan.

Vasudevan, A. and Menon, K.A., 1978, On Testing of Some Hypotheses Concerning the Transmission Mechanism of Monetary Policy: The Indian Experience, in Recent Developments in Monetary Policy, RBI.