Impact of Monetary Policy of Bangladesh Bank on the Performance of Stock Market in Bangladesh

Rubina Afroze[*]

Abstract

This study aims to identify the influence of Monetary Policy on the performance of Dhaka Stock Exchange. The researcher used selected indicators for measuring money supply – a key tool for implementing Monetary Policy and selected indicators for measuring the performance of Dhaka Stock Exchange Limited available for last 5 years (2006 – 2010) for this study. The empirical findings of this study show statistically significant correlation amongst the indicators for measuring money supply and the indicators for measuring performance of Dhaka Stock Exchange Limited, in addition to the statistically significant influence of Monetary Policy on the performance indicators of DSE.

Key Words: Broad Money, Reserve Money, Monetary Policy, Dhaka Stock Exchange Limited, Bangladesh Bank

Introduction

The stock market is an important ingredient of the financial system in Bangladesh. It is an important avenue for channeling funds to investors through mobilizing resources from individuals. In view of the rapidly increasing role of the stock market, volatility in stock prices can have significant implications on the performance of the financial sector as well as the entire economy. There exists important link between stock market performance and the monetary policy of the country. This study gives the valuable insight on the influence of monetary policy over the performance of the Dhaka Stock Exchange and helps to understand the importance of the same in Bangladesh perspective.

This paper is organized in different sections including the one that discusses on the Stock Markets of Bangladesh and Bangladesh Bank: the Central Bank that formulates idea on the Monetary Policy undertaken by the Bangladesh Bank, summarizes available researches related to the subject, describes methodology and data used for the study, presents the findings of the study, and finally concludes the study.

Stock Markets of Bangladesh and Bangladesh Bank: the Central Bank

Bangladesh capital market is one of the smallest in Asia region. It has two full-fledged automated stock exchanges namely Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE).

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[*]Senior Lecturer, Faculty of Business, ASA University Bangladesh

The stock exchanges are regulated by the Securities and Exchange Commission (SEC) and settlement of transactions of dematerialized securities in CSE and DSE was done by the Central Depository Bangladesh Limited (CDBL), the only Central Depository in Bangladesh. The market capitalization of DSE stood at BDT 2.85 Lac crore on 30 June 2011 and total 1969.25 crore securities were traded during 2010 – 11.

Bangladesh Bank, the central bank and apex regulatory body for the country's monetary and financial system. At present it has nine offices located at Motijheel, Sadarghat, Chittagong, Khulna, Bogra, Rajshahi, Sylhet, Barisal and Rangpur in Bangladesh; total manpower stood at 4,926 (officials 3,910 and subordinate staff 1,016) as of end FY 2011. Like other central banks, Bangladesh Bank performs all the core functions of a typical monetary and financial sector regulator, and a number of other non core functions. Its primary function is to provide the nation's money supply in addition to control interest rates, acting as a lender of last resort to the banking sector during times of financial crisis, supervisory role to prevent banks and other financial institutions from reckless or fraudulent behavior.

Monetary Policy of Bangladesh Bank

The Monetary Policy undertaken by Bangladesh Bank in general pursues dual objectives of maintaining price stability and supporting faster economic growth of the country. It tries to influences real sector price levels via financial sector prices by intervening policy interest rate (repo, reverse repo rate) as well as seeks to influence real sector prices via quantity theory based money stock targeting; monetary programs chalk out target growth paths for broad money (M2) and its sub aggregates, implemented by day to day management of growth path of reserve money (RM), currency in issue and balances of banks/financial institutions with the Bangladesh Bank. It may be noted that the main monetary policy instruments available to the Bangladesh Bank are open market operations, bank reserve requirements, interest rate policy, re-lending and re-discount (including using the term repurchase market), and credit policy (often coordinated with trade policy).

Monetary policy influences the general economy through a transmission mechanism. Both a restrictive and an expansionary monetary policy might have bilateral effects. In case of expansionary monetary policy, the government creates excess liquidity by engaging in open market operation, which results in an increase in bond price and lower interest rates. The lower interest rate would lead to the lower required rate of return and thus, the higher stock price. Additionally, an increase in monetary growth indicates excess liquidity available for buying stocks, eventually resulting in higher stock prices due to an increase of demand to both common stocks and the real good markets. However, monetary growth might result in higher inflation and hence, higher nominal interest rate according to Fisher equation. The higher interest rate leads to the higher required rate of return, which will result in the lower stock price. In case of a restrictive monetary policy, to reduce the growth rate of money supply would result in a decrease in the supply of funds for working capital and expansion for all business. Additionally, a restrictive monetary policy would raise market interest rate and hence firm's cost of capital. Furthermore, an

increase in interest rate would make it more expensive for individuals to finance mortgage payments and the purchase of other durable goods. However, decrease in money supply might result in the lower inflation, hence the lower required rate of return via the lower nominal interest rate. Thus, this would lead to the higher stock prices.

Literature Review

Various empirical studies, across a number of different stock market over a different time horizons, pointed out that Central Bank's adopted monetary policy of a country has implications on stock price movement. A brief overview on some significant recent empirical research works has been briefed below:

- Scharler (2004) showed monetary policy have a substantial impact on the stock market, using monetary growth and return on market as variable in US context.

- Maysami, Howe, & Hamzah (2004) showed Singapore's stock market and the property index form cointegrating relationship with changes in the short and long-term interest rates, industrial production, price levels, exchange rate and money supply

- Bredin, Hyde, and Reilly (2005) found that the UK monetary policy has a statistically significant impact on UK industrial level stock returns, using UK Policy Rate (e.g., base rate of Bank of England) and daily stock returns of FTSE as variables.

- Bordo, Dueker, and Wheelock (2008) found the effect of macroeconomic policy on the condition, using industrial production, inflation, money stock growth10-year Treasury security yield, 3-month Treasury bill yield, and real stock price index as variables.

- Li, Iscan, & Xu (2009) found that in response to an unanticipated 25 basis points increase in the instrument interest rate, stock prices in the U.S. decline by about 4% within seventeen months after the shock, and in Canada they only decline by about 0.8% within merely four months after the shock, using industrial production index, consumer price index (CPI), and stock market index: S&P 500 for the United States, and TSE 300 for Canada as variables.

- Singh (2010) found causal relation between stock market index i.e. BSE Sensex and three key macro economic variables of Indian economy (e.g., wholesale price index, index of industrial production, and exchange rate) by using correlation, unit root stationarity tests and Granger causality test.

- Jovanovi (2011) showed that monetary policy significantly Granger-causes stock market confidence in US Stock Market, using VIX index published by Chicago Board Options Exchange and US interest rate (Federal Funds Rate) as variables.

- Singh, Mehta, and Varsha (2011) found casual relationship between index returns and selected macroeconomic variable (e.g., employment rate, exchange rate, GDP, Inflation and money supply) in Taiwan context.

The gathering of material for this study on monetary policy & stock market was made somewhat difficult in Bangladesh context because of the lack of relevant references encountered in the literature. One recent study by Ahmed et. al. (2006) for Bangladesh found that contractionary monetary policy shock, measured by increases in short term policy interest rates have small, negative and short lived effect on the stock price index. Ahmed Akhtaruzzaman and Barua (2006) also showed that a contractionary monetary policy shock, measured by increase in the short-term policy interest rate has small negative effect on the stock price index, however the effect is short lived. Barua and Rahman (2006) showed in a study that since prices of stocks are mainly determined by company fundamentals, monetary policy can have only short term effect on stock prices. Even in the short run, effect of interest rates on stock prices is less clear-cut, and in a less developed capital market like Bangladesh, stock prices do tend to respond, for short term, to new reform measures and government incentives.

Research Methodology

Research Framework

Based on the existing researches, the researcher had found that there exists an impact of monetary policy stances, measured by changes in monetary policy variables (e.g., money supply, base rate, inflation, etc.) on stock prices, measured by stock indexes, return on stocks, and/or any appropriate proxies. Therefore, the researcher used similar variables available in Bangladesh context and tested relationship amongst the variables though hypothesis analysis.

The approach undertaken by the researcher for this study is exploratory in nature. Due to the availability of data for a shorter time period, the researcher did not opt for regression analysis or other test for causal relationship. However, the researcher used correlation analysis for checking linear relationship amongst the variables tested and t-test for testing different hypotheses constructed in the subsection "Tested Hypotheses" for analyzing statistical relationship between indicators for measuring money supply and indicators for measuring the performance of Dhaka Stock Exchange Limited.

Variable Used in the Study

The researcher had pursued to achieve the objective of the study by using available pertinent data for the last 5 years (2006 – 2010) and thus, the findings of the study may be interpreted considering the time period used. However, the interpretation may be further extended in conjunction with past studies made and with future research in the relevant sector.

Similar to the previous studies, variables used to manage the money supply (e.g., money stock, reserve requirement, etc.) and stock performance (e.g., index, capitalization, turnover, etc.) are used in this research. Basically, two types of variables are used — one for measuring money supply and the other for measuring the performance of Dhaka Stock Exchange Limited. The variables of the first set are — Broad Money Supply (M2_BB), Cash Reserve Requirement Balance with Bangladesh Bank (CRR_BB), and Total Reserve Requirement Balance with

Bangladesh Bank (TRR_BB) and the variables of the second set are — End Period Annual General Index of Dhaka Stock Exchange Limited (GI_DSE), End Period Market Capitalization of Dhaka Stock Exchange Limited (MC_DSE), and End Period Annual Turnover of Dhaka Stock Exchange Limited (TO_DSE). Brief conceptual descriptions of the variables used are as follows:

- Broad money is a measure of the money supply that includes more than just physical money such as currency and coins (also termed narrow money). It generally includes demand deposits at commercial banks, and any monies held in easily accessible accounts. Components of broad money are still very liquid, and non-cash components can usually be converted into cash very easily. The most commonly used measure of broad money is M2, which includes currency and coins, and deposits in checking accounts, savings accounts and small time deposits, overnight repos at commercial banks, and non-institutional money market accounts. This is the main measure of the money supply, and is the economic indicator usually used to assess the amount of liquidity in the economy, as it is relatively easy to track (Wikipedia, 2011).

- The reserve requirements is a central bank regulation that sets the minimum reserves each commercial bank must hold to customer deposits and notes i.e. the amount that the bank surrenders with the central bank. It would normally be in the form of flat currency stored in a bank vault (vault cash), or with a central bank. The reserve ratio is sometimes used as a tool in the monetary policy, influencing the country's economy, borrowing, and interest rates. Statutory Liquidity Ratio (SLR) restricts the bank's leverage in pumping more money into the economy. On the other hand, Cash Reserve Ratio (CRR) is the portion of deposits that the banks have to maintain with the Central Bank. To meet SLR, banks can use cash, gold or approved securities whereas with CRR it has to be only cash. CRR is maintained in cash form with central bank, whereas SLR is maintained in liquid form with banks themselves (Wikipedia, 2011).

- Stock Market Index or Share Index refers to the statistical indicator used in measurement and reporting of changes in the market value of a group of stocks/shares. Different stock indices track the market differently--depending on (1) which averaging method is used to establish the index, (2) whether the index is broad based or narrow based, and (3) whether the averaging method assigns weights on the basis of market price or market capitalization (Business Dictionary, 2011).

- Market Capitalization is a measurement of size of a business enterprise (corporation) equal to the share price times the number of shares outstanding (shares that have been authorized, issued, and purchased by investors) of a publicly traded company. As owning stock represents ownership of the company, including all its equity, capitalization could represent the public opinion of a company's net worth and is a determining factor in stock valuation (Wikipedia, 2011).

- Turnover refers to the volume or value of shares traded on a stock exchange during a day, month, or year (Business Dictionary, 2011). A stock market's turnover ratio measures how often shares change hands and is simply a relative measure of the supply and demand relationship which tells us how volatile a stock will trade given an imbalance in supply or demand either to the upward or downward.

Data Collection and Data Analysis

All data used in the research are manually extracted by the researcher from different publications of Bangladesh Bank, annual reports of the respective Stock Exchanges, and from respective websites of the Stock Exchanges and or Central Banks. The researcher did necessary calculation and also performed different statistical tests and analysis using MS Excel 2007, SPSS 16, and Minitab 14.

Tested Hypotheses

Various empirical studies found that monetary policy affects equity markets in different country context, which is, by now, well-documented in the literature. Based on these findings, the researcher also assumed similar basic hypothesis and tested the same in this study to see the impact of Monetary Policy undertaken by Bangladesh Bank on the Performance of the Dhaka Stock Exchange Limited only. The details of the tested hypotheses are shown in the following table:

Table 1: Hypothesis Tested in the Study

Hypothesis Ref.	Null Hypothesis (H_0)	Alternative Hypothesis (H_1)
1	Broad Money Supply has no influence to the End Period Annual General Index of Dhaka Stock Exchange Limited.	Broad Money Supply has influence to the End Period Annual General Index of Dhaka Stock Exchange Limited.
2	Cash Reserve Requirement Balance with Bangladesh Bank has no influence to the End Period Annual General Index of Dhaka Stock Exchange Limited.	Cash Reserve Requirement Balance with Bangladesh Bank has influence to the End Period Annual General Index of Dhaka Stock Exchange Limited.
3	Total Reserve Requirement Balance with Bangladesh Bank has no influence to the End Period Annual General Index of Dhaka Stock Exchange Limited.	Total Reserve Requirement Balance with Bangladesh Bank has influence to the End Period Annual General Index of Dhaka Stock Exchange Limited.
4	Broad Money Supply has no influence to the End Period Market Capitalization of Dhaka Stock Exchange Limited.	Broad Money Supply has influence to the End Period Market Capitalization of Dhaka Stock Exchange Limited.
5	Cash Reserve Requirement Balance with Bangladesh Bank has no influence to the End Period Market Capitalization of Dhaka Stock Exchange Limited.	Cash Reserve Requirement Balance with Bangladesh Bank has influence to the End Period Market Capitalization of Dhaka Stock Exchange Limited.
6	Total Reserve Requirement Balance with Bangladesh Bank has no influence to the End Period Market Capitalization of Dhaka Stock Exchange Limited.	Total Reserve Requirement Balance with Bangladesh Bank has influence to the End Period Market Capitalization of Dhaka Stock Exchange Limited.
7	Broad Money Supply has no influence to the End Period Annual Turnover of Dhaka Stock Exchange Limited.	Broad Money Supply has influence to the End Period Annual Turnover of Dhaka Stock Exchange Limited.

Hypothesis Ref.	Null Hypothesis (H_0)	Alternative Hypothesis (H_1)
8	Cash Reserve Requirement Balance with Bangladesh Bank has no influence to the End Period Annual Turnover of Dhaka Stock Exchange Limited.	Cash Reserve Requirement Balance with Bangladesh Bank has influence to the End Period Annual Turnover of Dhaka Stock Exchange Limited.
9	Total Reserve Requirement Balance with Bangladesh Bank has no influence to the End Period Annual Turnover of Dhaka Stock Exchange Limited.	Total Reserve Requirement Balance with Bangladesh Bank has influence to the End Period Annual Turnover of Dhaka Stock Exchange Limited.

Research Findings

Indicators for Measuring Money Supply

The Broad Money Supply (M2), CRR Reserve with Bangladesh Bank, and total Reserve with Bangladesh Bank stood at BDT 287,409.72 crore, BDT 13,829.82 crore, and BDT 20,887.00 crore respectively during the end of last year. For the last 5 years (2006 – 2010), the average growth rate of the Broad Money Supply (M2), CRR Reserve with Bangladesh Bank, and total Reserve with Bangladesh Bank was 16.99%, 18.84%, and 12.54% respectively. The following graph shows a comparative trend scenario of the three variables for the last 5 years:
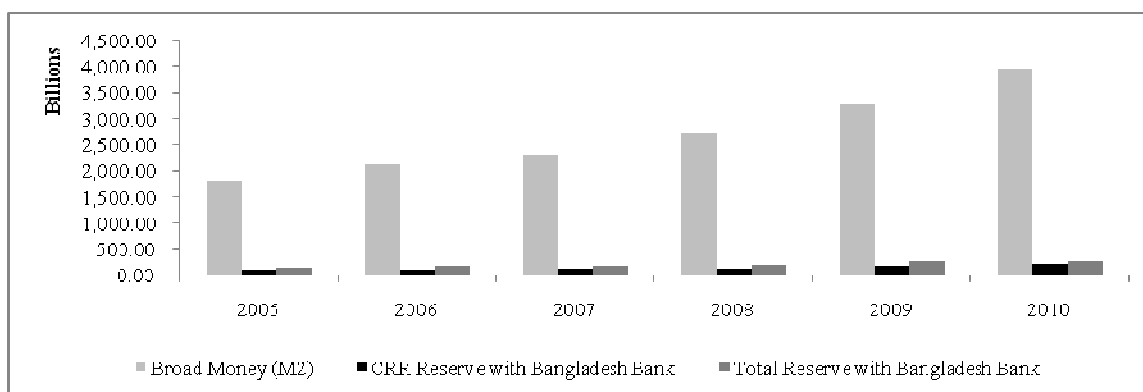
Source: Monthly Economic Trends (Bangladesh Bank), www.dsebd.org and www.bangladesh-bank.org

Indicators for Measuring Performance of Dhaka Stock Exchange Limited

The total market capitalization and the General Index of the Dhaka Stock Exchange Limited stood at BDT 306,519.10 crore and at 8,290.41 respectively during the end of last year. For the last 5 years (2006 – 2010), the average growth rate of the market capitalization and the General Index of DSE were 73.21% and 47.21% respectively. This growth rate was comparatively higher than the same of some leading Stock Exchanges from neighboring SAARC countries, comparison of which are shown in the table 2:

Table 2: Comparative Scenario of Selected Stock Exchanges

Stock Exchanges	Average End Period Growth Rate of Market Capitalization (2006-2010)	Average End Period Return of Key Index (2006-2010)
Dhaka Stock Exchange Limited, Bangladesh	73.21%	47.21%
Bombay Stock Exchange, India	28.08%	27.97%
Karachi Stock Exchange, Pakistan	16.60%	14.64%
Colombo Stock Exchange, Srilanka	45.19%	42.95%

Source: Researcher's Calculation based on the Data extracted from Monthly Economic Trends (Bangladesh Bank),
www.dsebd.org, www.bseindia.com, www.kse.com.pk, www.cse.lk , and www.bangladesh-bank.org
Note: Key Indexes for Bangladesh, India, Pakistan, and Srilanka are DSE General Index, BSE Sensex, KSE All Share Index, and CSE All Share Price Index respectively.

On the other hand, the market turnover of the Dhaka Stock Exchange Limited stood at BDT 38,717.41 crore with an average growth rate of 187% for the last 5 years (2006 – 2010). During 2006 – 2010, the average total market capitalization, total turnover and the General Index of the Dhaka Stock Exchange Limited was BDT 126,188.80 crore, BDT 12,482.20 crore and 4,008.97 respectively. The following graph shows a comparative trend scenario of the three variables for the last 5 years:
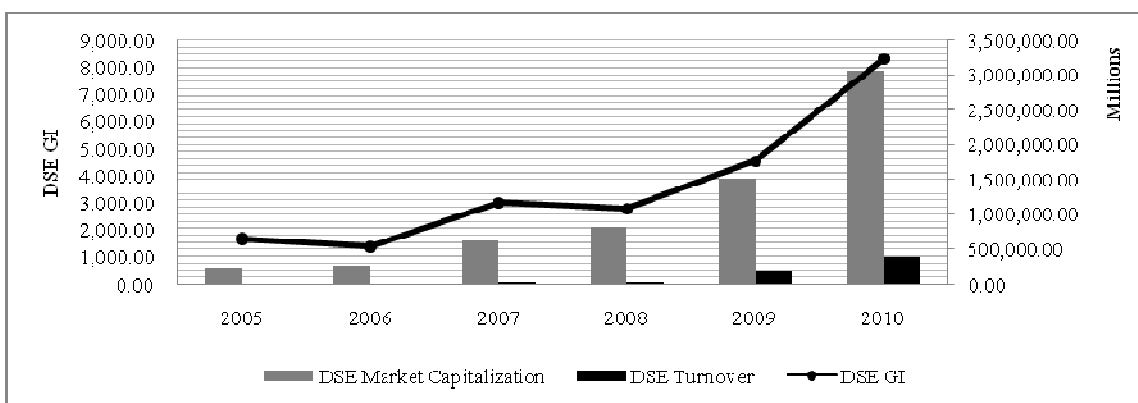
Source: Monthly Economic Trends (Bangladesh Bank), www.dsebd.org and www.bangladesh-bank.org

Correlation Analysis

There exists strong correlation amongst the indicators for measuring money supply and the indicators for measuring the performance of Dhaka Stock Exchange Limited. The following correlation matrix shows the relationship amongst the variables.

Table 3: Correlation Matrix of the Variables

		M2_BB	CRR_BB	TRR_BB	GI_DSE	TO_DSE	MC_DSE
M2_BB	Pearson Correlation	1	.994**	.962**	.946**	.937**	.963**
	Sig. (2-tailed)		.000	.002	.004	.006	.002
	N	6	6	6	6	6	6
CRR_BB	Pearson Correlation	.994**	1	.935**	.969**	.965**	.985**
	Sig. (2-tailed)	.000		.006	.001	.002	.000
	N	6	6	6	6	6	6
TRR_BB	Pearson Correlation	.962**	.935**	1	.855*	.874*	.883*
	Sig. (2-tailed)	.002	.006		.030	.023	.020
	N	6	6	6	6	6	6
GI_DSE	Pearson Correlation	.946**	.969**	.855*	1	.979**	.994**
	Sig. (2-tailed)	.004	.001	.030		.001	.000
	N	6	6	6	6	6	6
TO_DSE	Pearson Correlation	.937**	.965**	.874*	.979**	1	.989**
	Sig. (2-tailed)	.006	.002	.023	.001		.000
	N	6	6	6	6	6	6
MC_DSE	Pearson Correlation	.963**	.985**	.883*	.994**	.989**	1
	Sig. (2-tailed)	.002	.000	.020	.000	.000	
	N	6	6	6	6	6	6
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Hypothesis Test and Results

The test result shows that all alternative hypotheses (H1) are accepted, except for Hypothesis-5, 6, 8 & 9 where null hypothesis (H0) is accepted. This findings shows that the influence of CRR Reserve with Bangladesh Bank and total Reserve with Bangladesh Bank could not be proved for total market capitalization and total turnover of Dhaka Stock Exchange individually. However, the researcher was able to identify the influence of indicators for measuring money supply (e.g., Broad Money Supply (M2), CRR Reserve with Bangladesh Bank, and total Reserve with Bangladesh Bank) on the End Period Annual General Index of Dhaka Stock Exchange Limited and also the influence of Broad Money Supply (M2) on all indicators for measuring performance of Dhaka Stock Exchange Limited (e.g., total market capitalization, total turnover and the General Index of the Dhaka Stock Exchange Limited). Therefore, it can be generally inferred that indicators for measuring money supply has influence on the indicators for measuring performance of Dhaka Stock Exchange Limited. This overall findings support the research of earlier findings. The test results have been shown in the following table:

Table 4: t-test Results

Test Variables	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
M2_BB - GI_DSE	2.6600010E5	7.7437116E4	3.1613570E4	1.8473483E5	3.4726537E5	8.414	5	.000
M2_BB - TO_DSE	2.5915730E5	6.5673058E4	2.6810914E4	1.9023765E5	3.2807694E5	9.666	5	.000
M2_BB - MC_DSE	1.6057075E5	3.7390015E4	1.5264410E4	1.2133234E5	1.9980917E5	10.519	5	.000
CRR_BB - GI_DSE	9.3416000E3	1.9082328E3	779.0327941	7.3390325E3	1.1344168E4	11.991	5	.000
CRR_BB - TO_DSE	2.4987967E3	1.1281678E4	4.6057256E3	-9.3405980E3	1.4338191E4	.543	5	.611
CRR_BB - MC_DSE	-9.6087749E4	1.0333500E5	4.2186337E4	-2.0453118E5	1.2355682E4	-2.278	5	.072
TRR_BB - GI_DSE	1.6248683E4	3.0846615E3	1.2593078E3	1.3011530E4	1.9485837E4	12.903	5	.000
TRR_BB - TO_DSE	9.4058800E3	1.1264690E4	4.5987903E3	-2.4156869E3	2.1227447E4	2.045	5	.096
TRR_BB - MC_DSE	-8.9180666E4	1.0318141E5	4.2123635E4	-1.9746292E5	1.9101586E4	-2.117	5	.088

Conclusion

The findings of this study support the assumptions that monetary policy undertaken by Bangladesh Bank can influence the performance of the Dhaka Stock Exchange Limited. Therefore, the coordinated role of Bangladesh Bank and the Security Exchange Commission has gained increasing importance in maintaining a stable Capital Market.

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