

## Debt Management and OMO of Bangladesh Bank

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**Abstract** *Government's borrowing from the banking system for financing the annual development program (ADP) is the momentous financial portfolio of Bangladesh. It often contains complex financial structures due to operational procedure and fluctuation of market. Specific risk of government securities for valuation is zero according to Basel II. Investment in government securities is exposed market risk. Effectual debt structures with proper revenue collection facilitate governments reducing their exposure to interest rate, currency and other risks for income inequalities and poverty alleviation. To implement the ADP in situations of shortage of required foreign and nonbank funds, the government needs to borrow money from the deposit money banks (DMBs) and Bangladesh Bank (BB). Government borrowing through overdraft has inflationary outcome. Government debt from the DMBs through treasury bills and bonds repaying the BB its past loan will reduce the liquidity. In order to offset this situation BB needs to inject money through repo instruments of open market operation (OMO) to the banking system. As a result, RM grows with lower money multiplier and financial deepening impacting growth rates of the economy. Amortization, securitization and gradual offload of government debt in case of BB will allow dynamism in the market to flourish. Foreign fund is required to improve the asset quality of M2 and RM absorbing the shocks for economic growth. The objective of this paper is to gain insight regarding underlying factors related to interest rate, exchange rate and inflation in the country.*

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## **Introduction**

To understand the DMBs, financial institutions and BBs investment in the government securities operational procedure of debt management and OMO have been analyzed. Shortfall of excess reserves of banks owing to currency growth increases the inter-bank call money rate and general interest rate. Increase in overall net short position of banks move up the exchange rate reducing international reserves. Lower amount of net foreign asset (NFA) in broad money (M2) and reserve money (RM) comparing net domestic asset (NDA) respectively impact the asset quality mix and ability of payment for credit rating. Unplanned borrowings of the government from the DMBs reduce the credit expansion to the private sector. Following the operational procedure of debt management Primary dealers (PDs) submit their bids in the auction of government securities stating respective amount and rate. Auction committee determine the cut-off rate bearing in mind the macroeconomic variables. Repo rate, reverse repo rate and sale/ buy of foreign exchange may also be impacted by the auction committee considering availability of liquidity. Transaction of government treasury bills and bonds are held in the over the counter market (OTC) due to lack of secondary market. By buying and selling government securities, BB affects the aggregate level of balances available in the banking system. BB implements monetary policy primarily by conducting OMO. In OMO selling of BB bills mop up the liquidity from the banking system. In case of repo the liquidity increases and reverse repo dried up the liquidity. If BB wants to rouse the market it may follow an expansionary monetary policy separating budgetary and monetary requirements. The usual aim of OMO is to put in order the short term interest rate and the supply of base money (RM), and thus indirectly manage the total money supply. This involves meeting the demand of RM at the target interest rate by buying and selling government securities and related financial instruments. BB bills more effectively mop-up the liquidity comparing government securities from the DMBs. Monetary variables such as inflation, interest rates or exchange rates are maintained by OMO.

Effectual debt structures with proper revenue collection facilitate governments reducing their exposure to interest rate, currency and other risks for income inequalities and poverty alleviation. To implement the annual development

program (ADP) because of required foreign and nonbank funds leads the government to borrow money from the deposit money banks (DMBs) and BB. Government borrowing through overdraft from BB has inflationary outcome. Government debt from the DMBs through treasury bills and bonds repaying the BBs past due loan will reduce the liquidity. In order to offset this situation BB need to inject money through repo, special repo and liquidity facility (LSF) instruments of open market operation (OMO) to the banking system. Buying of foreign exchange also increases the Taka liquidity in the banking system of Bangladesh. As a result, RM grows with lower money multiplier and financial deepening impacting call money rates, exchange rates and inflation of the economy. Foreign fund is required to improve the asset quality of M2 and RM absorbing the shocks for economic growth. The intention of this paper is to gain insight regarding underlying factors in monitoring interest rate, exchange rate and inflation in the country.

Government's debt for realizing ADP from banking system is the momentous financial portfolio of Bangladesh. The success of monetary programming depends on planned government borrowing from the banking system. It often contains complex financial structures due to operational procedure and fluctuation of market. Specific risk of government securities for valuation is zero according to Basel II. Investment in government securities is exposed with market risk. Amortization, securitization and gradual offload of government debt in case of BB will allow the market dynamics cleaning the balance sheet of BB is another schema of this paper.

### **Research methodology**

Qualitative and quantitative analysis has been made in this paper. Macroeconomic and microeconomic theory has been verified with complex real term monetary outcome. Banking and finance data is used intensively before making inference related to financial securities. OMO, yield curve, extrapolation and interpolations of securities, Basel accord and government securities auction procedure have been discussed to facilitate the financial interactions of the variables.

### **Organization of the paper**

Literature survey on course of debt management is discussed in chapter-I. Salient features of Government Treasury Bills and Bonds in Bangladesh can be found in chapter-II. Chapter-III deals with OMO and monetary policy. Conclusion is described in chapter- IV.

## **Chapter I**

### **Literature survey on course of debt management and OMO**

Literature survey on debt management and OMO is conducted to gain wide-ranging knowledge in the multidimensional perspective. Adepoju, Adenike Adebunola and **Obayelu, Abiodun Elijah (2007)** has reviewed the roles of debt management practices on sustainable economic growth and development with particular emphasis on Nigeria. Information was generated extensively from literature, the Nigeria Central Bank and National Bureau of Statistic reports. The analyses of the data collected with descriptive statistics shows that, availability of access to external finance strongly influences the economic development process of any nation. Debt is an important resources needed to support sustainable economic growth. But a huge external debt without servicing as it is the case for Nigeria before year 2000 constituted a major impediment to the revitalization of her shattered economy as well as the alleviation of debilitating poverty. The much needed inflow of foreign resources for investment stimulation, growth and employment were hampered. Without credit cover, Nigerian importers were required to provide 100 percent cash covers for all orders and this therefore placed them to a competitive disadvantage compared to their counterparts elsewhere. Failure of any owing country to service her debt obligation results in repudiation risk preventing such to obtain new loans since little or no confidence will be placed on the ability to repay. It will also undermine the effort to obtain substantive debt relief over the medium term with a tremendous increase in interest, arrears and other penalties. This will subsequently depress the economy both in the long and short runs. Best arrangement in debt payment must be put in place from time to time in response to changes in the economy and the polity. Debt can only be productive if well managed so as to make the rate of return higher than the cost of debt servicing.

Hai-Chin Yu (Taiwan), Ken H. Johnson (USA), Der-Tzon Hsieh (Taiwan) -2008 using an effective sample of 3,453 observations selected from the Taiwanese stock exchange attempts to reconcile divergent outcomes from the extant literature on debt structure (public, bank, and non-bank private debt). Sampled firms from this emerging market generally acquire debt from both public and private sources, with a strong preference for bank debt, suggesting, among other things, that bank debt and public debt complement each other rather than acting as substitutes.

In the United States, as of 2006 the Fed sets an interest rate target for the Fed funds (overnight bank reserves) market. When the actual Fed funds rate is higher than the target, the desk will usually increase the money supply via a repo

(effectively lending). When the actual Fed funds rate is less than the target, the desk will usually decrease the money supply via a reverse repo (effectively borrowing). The European Central Bank has similar mechanisms for their operations; however, it uses a four-tiered approach with different goals: beside its main goal of steering and smoothing Eurozone interest rates while managing the liquidity situation in the market the ECB also has the aim of signalling the stance of monetary policy with its operations.

The regular weekly “main refinancing operations” and the monthly “longer-term refinancing operations” provide liquidity to the financial sector, while ad-hoc “fine-tuning operations” (in the form of reverse or outright transactions, foreign exchange swaps and the collection of fixed-term deposits) aim to smooth interest rates caused by liquidity fluctuations in the market and “structural operations” are used to adjust the central banks’ longer-term structural positions vis-a-vis the financial sector.

The Swiss National Bank currently targets the 3 month Swiss franc LIBOR rate, and borrows or lends Swiss francs directly with Swiss banks (in other words, without using repos) on an almost daily basis. These borrowings or loans are typically made for 1 day or 1 week, but may be as long as 1 month. In the U.S., the Federal Reserve (Fed) most commonly uses overnight repo agreements (repos) to temporarily create money, or reverse repos to temporarily destroy money, which offset temporary changes in the level of bank reserves.

The Fed also makes outright purchases and sales of securities through the System Open Market Account (SOMA) with its manager over the Trading Desk at the New York Reserve Bank. The trade of securities in the SOMA changes the balance of bank reserves, which also affects short term interest rates. The SOMA manager is responsible for trades that result in a short term interest rate near the target rate set by the Federal Open Market Committee (FOMC), or create money by the outright purchase of securities. Very rarely will it permanently destroy money by the outright sale of securities. These trades are made with a group of about 19 banks or bond dealers who are called primary dealers. Money is created or destroyed by changing the reserve account at a bank. The Fed has conducted open market operations in this manner since the 1920s, through the Open Market Desk at the Federal Reserve Bank of New York, under the direction of the Federal Open Market Committee.

The Eurosystem’s regular open market operations consist of one-week euro liquidity-providing operations (main refinancing operations or MROs) as well as three-month euro liquidity-providing operations (longer-term refinancing

operations or LTROs). MROs serve to steer short-term interest rates, to manage the liquidity situation, and to signal the stance of monetary policy in the euro area, while LTROs aim to provide additional, longer-term refinancing to the financial sector. Currently, the regular operations are complemented by euro liquidity-providing operations with a maturity of (around) one, six, twelve and thirty-six months as well as US-dollar liquidity-providing operations. In addition, the Eurosystem has launched two Covered Bond Purchase Programmers (CBPP, which ended in June 2010 and CBPP2, which started in November 2011) in order to purchase euro-denominated covered bonds and, since 10 May 2010, it has conducted interventions in debt markets under the Securities Markets Program (SMP). The liquidity provided through the SMP is currently absorbed by weekly collections of fixed-term deposits.

India's Open Market Operation is much influenced by the fact that it is a developing country and the capital flows are much different than other developed countries. Thus Reserve Bank of India, being the Central Bank of the country, has to make policies and use instruments accordingly. Prior to the 1991 financial reforms, RBI's major source of funding and control over credit and interest rates was the CRR (Cash reserve ratio) And the SLR (Statutory Liquidity Ratio). But post the reforms, the use of CRR as an effective tool was de-emphasized and the use of Open market operations. OMO is more effective in adjusting market liquidity.

The two traditional types of OMO used by RBI:

- a. Outright purchase (PEMO): Is outright buying or selling of government security. (Permanent).
- b. Repurchase agreement (REPO): Is short term, and are subject to repurchase.

But even after sidelining CRR as an instrument, there was still less liquidity and skewedness in the market. And thus on the recommendations of the Narshiman Committee Report(1998), the RBI brought together a Liquidity Adjustment Facility (LAF). It commenced in June, 2000 and it was setup to oversee liquidity on a daily basis and monitor market interest rates. For the LAF, two rates are set by the RBI: Repo rate and reverse repo rate. Repo rate is applicable while selling securities to RBI (Thus daily injection of cash flow(liquidity)), while reverse repo rate is applicable when banks buy back those securities(Absorption of liquidity). Also, these interest rates that are fixed by the RBI also help in determining other market interest rates.

India experiences large capital inflows every day, and even though the OMO and the LAF policies were able to withhold the inflows, another instrument was

needed to keep the liquidity intact. Thus on the recommendations of the Working Group of RBI on instruments of Sterilization (December, 2003), a new scheme known as the Market stabilization scheme was set up. The LAF and the OMO were dealing with day to day liquidity management, whereas the MSS was set up to sterilize the liquidity absorption and make it more enduring. Under this scheme the RBI issues additional T-bills and securities to absorb the liquidity. And the money goes into the Market Stabilization Scheme Account (MSSA). And the RBI cannot use this account for paying any interest or discounts and cannot credit any premiums to this account. And the Government in collaboration with the RBI fixes a ceiling amount on the issue of these instruments. But for an open market operation instrument to be effective there has to be an active securities market for RBI to make any kind of effect on the liquidity and rates of interest.

## **Chapter II**

### **Salient features of Government Treasury Bills and Bonds in Bangladesh**

Government treasury bills and bonds have number of issues to consider include overall liquidity, inter-bank call money rate, deficit budget financing need of the government and credit rating. These factors play a role in determining the value of government securities and the extent to which it fits in the portfolio. PDs are required to quote two-way price for trade of government securities. PDs are needed to underwrite according to their respective share against the announced amount of government securities in a particular auction. Banks, financial institutions, insurance company, corporation, pension funds, resident and non-resident individuals and institution can participate in the auction. These government securities are freely saleable and transferable. Non-resident individuals and institutions can apply using foreign currency (FC) accounts. The purchased securities by the non-resident are not transferable to resident within one year. These securities are easily transferable among non-resident. The profit and sale value of the securities are easily transferable in foreign currency after tax. The minimum face value of the government securities is Tk. 1.0 lac. Applied amount of the securities should be divisible by Tk.1.0 lac (Tk. one hundred thousand). Only 15 PDs can participate in the primary auctions. At the same time, others can apply through PDs. Government securities can also be issued to BB in accordance to the rate set by the auction committee. The outstanding amount of government treasury bills and bonds in the primary auction is Tk.13311.00 crore and Tk.60384.47 crore respectively at the end of February, 2012. Required unencumbered approved securities portion 13% of demand and time deposit of

DMBs (out of 19% SLR) is approximately Tk.54056.00 crore for that stipulated period. The interest amount of government treasury bills and bonds is duly addressed in the current account of revenue budget of the government. The deficit financing of the government including local and foreign borrowing for implementing ADP is limited to 5% of GDP. Proper revenue collection will rationally impact fiscal and monetary policy reducing income inequalities for poverty alleviation.

**Face Value/ Par value :** Face value (also known as the par value or principal) is the amount of money a holder will get back at the end of bond maturity. Treasury bills of different tenor are submitted at discount price and received at par value (Tk.100) at the end of the maturity. Newly issued bond usually sells at the par value. Government bonds normally calculated with par value of Tk.100. What confuses many people is that the par value is not the price of the bond. A bond's price fluctuates throughout its life in response to a number of variables. When a bond trades at a price above the face value, it is said to be selling at a premium. When a bond sells below face value, it is said to be selling at a discount.

**Coupon rate (interest rate):** Coupon is the amount the bondholder receives as interest payments. It's called a "coupon" because sometimes there are physical coupons on the bond that can be tear off and redeem for interest. However, this was more common in the past. Nowadays, records are more likely to be kept electronically. Subsidiary general ledger (SGL) is maintained for government securities. Government bonds pay interest every six months. The coupon is expressed as a percentage of the par value. If a bond pays a coupon of 10% and its par value is Tk.100, then it'll pay Tk.10 of interest a year. A rate that stays as a fixed percentage of the par value like this is a fixed-rate bond. Another possibility is an adjustable interest payment, known as a floating-rate bond. In this case the interest rate is tied to market rates allowing variability through an index, such as the rate on US Treasury bills. It may be happened investors will pay more for a high coupon than for a low coupon. All things being equal, a lower coupon means that the price of the bond will more over the life of bond.

**Maturity :** Maturity date is the date in the future on which the investor's principal will be repaid. A bond that matures in one year is much more predictable and thus less risky than 20 years government bond. Therefore, in general, the longer the time to maturity, the higher the interest rate. Also, all things being equal, a longer term government bond will fluctuate more than a shorter term bond.

**Issuer :** Issuer of a bond is a crucial factor to consider, as the issuer's stability is the main assurance of getting paid back. Government is far more secure than any



corporation. Its default risk (the chance of the debt not being paid back) is extremely small and virtually government securities are known as risk-free assets. The reason behind this is that a government has ability to impose tax. A company, on the other hand, must continue to make profits, which is far from guaranteed. This additional risk means corporate bonds must offer a higher yield in order to attract investors. This is known as risk/return trade-off.

### **Operational procedure: auction of Bangladesh Government Treasury Bills**

In the national budget the government decide how much money they want take from the banking system for deficit financing. The government bills are issued through a treasury style French Auction. Highest to lowest bids with higher rate is accepted as cut-off price. Ministry of Finance (MOF) and BB prepare an auction calendar taking into account borrowing provision for instance Tk.18000.00 crore in a financial year. This amount may be changed considering the pace of development works and foreign financing. Government usually have access to money less than 10% through short term instruments and around 90% money of declared amount (Tk.18000.00 crore) through long term instrument. This ratio is changeable by the government. 91-Day, 182-Day and 364-Day government treasury bills are short term instruments. 5-Year, 10-Year, 15 Year and 20 Year government treasury bonds are long term instruments. Readily available 15 PDs (12 banks and 3 non banks) submit their bids mentioning respective amount and rate in the stipulated auction considering the acknowledged amount say Tk. 300.00 crore. Auction amount is pre announced for instance Tk.300.00 crore in a particular auction. Obligation amount in the auction varies among PDs for illustration Sonali Bank need to submit 9% of declared amount and for financial institutions the required participation rate is 1%. Auction committee consists with MOF and BB determines the cut-off price from lowest to highest price of the auction of Government Treasury Bill. If the price is low the rate will be high and in case of higher price the rate will be low. Consequently, the quoted PDs lower price below the cut-off rate will get higher rate. The PD will get different rate below the cut-off rate. As the rate diverge BB calculate weighted average rate (WAR) for the yield curve of government treasury bills (Table-1). Yield curve is the relation between interest rate and different maturity of government treasury bills and bonds. Government treasury bills are sold on discount basis. PDs deposit discount amount Tk.98.00 in the BB and receive face value Tk.100.00 at maturity. Banks are reported treasury bill and bonds price at cost. The outcome of BB's action is aptly reflected in the yield curve of different maturities providing short run and long run rate preferably with buyback facility in bonds allowing variability in the business cycle (time path).

In the auction stated at Table -1 the committee has decided to accept the bids(s) up to cut- off offer price Tk 97.4421 with 5.25% rate. Total amount received from the competitive bids is Tk 255.50 crore. Distributed amount to the PDs is Tk.

**Table 1: Auction of 182-Day Government Treasury Bill.**

Auction amount Tk.350.00 Crore  
(Tk. in crore)

Sl no.	Name of BIDDER	Offer Price	Implicit yield to Investor in %	Face Value	Cumm. Face Value	Offer Value of Bills	Weighted Average Price	Weighted Average Yield
1.	NCCBL	97.5134	5.10	28.00	28.00	273,037,520.00	97.5134	5.10
2.	Jamuna Bank Ltd.	97.5134	5.10	24.50	52.50	238,907,830.00	97.5134	5.10
3.	Sonali Bank Ltd.	97.5039	5.12	31.50	84.00	307,137,285.00	97.5098	5.11
4.	Mercantile Bank Ltd.	97.4896	5.15	28.00	112.00	272,970,880.00	97.5048	5.12
5.	Uttara Bank Ltd.	97.4850	5.16	28.00	140.00	272,958,000.00	97.5008	5.13
6.	Prime Bank Ltd.	97.4659	5.20	28.00	168.00	272,904,520.00	97.4950	5.14
7.	National Bank Ltd.	97.4659	5.20	28.00	196.00	272,904,520.00	97.4908	5.15
8.	Agrani Bank Ltd.	97.4421	5.25	31.50	227.50	306,942,615.00	97.4841	5.16
9.	Southeast Bank Ltd.	97.4421	5.25	28.00	255.50	272,837,880.00	97.4795	5.17

94.50 crore with accepted offer price and rate Tk 97.4421 and 5.25 % correspondingly (Table-2). Auction committee prudently settle on the price and rate in view of key monetary indicators of the country. 91-Day government treasury bill rate refers as risk free rate or reference rate. This rate is used as direction rate to calculate deposit rate, lending rate and call money rate accommodating risk for example.

#### Calculation procedure of Treasury Bill

Implicit yield (**2.02%**) =  $[(100 - 99.5000 \text{ (offer price)}) \times 365 \times 100] / (99.5000 \text{ (offer price)} \times 91)$  (duration of the bill).

Offer price (**99.50**) =  $(365 \times 100 \times 100) / ((91 \times 2.02) + (365 \times 100))$

Offer value (**99.50**) =  $(99.50 \text{ (Offer price)} \times 100)$  (Face value) / 100

Weighted price (**99.50**) =  $(199.0 \text{ (Cumulative offer value)}) \times 100 / 200$  (Cumulative face value).

**Table 2 : Distribution to PDs**

1	Janata Bank Ltd	97.4421	5.25	31.50	287.00	306,942,615.00	97.4754
2	ILFSL	97.4421	5.25	3.50	290.50	34,104,735.00	97.4750
3	Mutual Trust Bank.	97.4421	5.25	24.50	315.00	238,733,145.00	97.4724
4	IPDC	97.4421	5.25	3.50	318.50	34,104,735.00	97.4721
5	LBFL	97.4421	5.25	3.50	322.00	34,104,735.00	97.4718
6	AB Bank Ltd.	97.4421	5.25	28.00	350.00	272,837,880.00	97.4694

Corresponding Yield (**2.02%**) =  $[(100-99.50 \text{ (Weighted Average Price)}] \times 365 \times 100 / (99.50 \times 91\text{-day})$ .

#### **Operational procedure: auction of Government Treasury Bonds.**

15 PDs are also submits bid quoting coupon rate and relevant amount for government treasury bonds. The auction committee fix the cut-off rate. The number of PDs can be changed. If the submitted coupon rate (8.24%) of PD is lower than cut-off rate (8.25%) afterwards price of the bond will be higher at Tk. 100.0403 and respective PD need to deposit premium amount Tk.181350 in order to get higher yield (8.25%) demonstrated in the Table-3. As a result, only cut-off rate is used in the yield curve of government treasury bond. In order to fixing the cut-off rate of bonds among others the auction committee consider overall liquidity (Table-4).

If the required auction amount is Tk. 300.00 crore and submitted amount is Tk. 350.00 crore by the 15 PDs in a particular auction and the auction committee eventually select up to serial no.10 bid as cut-off rate covering Tk.250.00 crore then Tk. 50.00 crore is indispensable to distribute among rest 5 PDs on pro rata basis. Here to determine pro rata amount for Sonali Bank Tk.13.50((27×50)/100) individual PD's applied amount Tk. 27.00 crore ( 9% of Tk.300.00 crore) will be multiplied by Tk. 50.00 crore (distribution amount) and the term will be divided by Tk. 100.00 crore.

#### **Distribution process of Government Treasury Bond**

In a particular auction of Tk. 500 crore the committee has decided to accept the bids up to cut-off offer rate 8.25% amounting Tk. 455.00 crore (Table-5). Distribution amount to the PDs is Tk. 45.00 at cut-off rate 8.25% (Table-6).

**Table 3 : Auction of 5-Year Government Treasury Bond.**

Sl no	Name of BIDDER	Offered amount (Crore-Tk.)	Offered Yield	Cumulative offered amount
1.	Sonali Bank Ltd.	45.00	8.2400%	45.00
2.	Agrani Bank Ltd.	45.00	8.2500%	90.00
3.	Janata Bank Ltd.	45.00	8.2500%	135.00
4.	NCCBL	40.00	8.2500%	175.00
5.	AB Bank Ltd.	40.00	8.2500%	215.00
6.	Uttara Bank Ltd.	40.00	8.2500%	255.00
7.	Mercantile Bank Ltd.	40.00	8.2500%	295.00
8.	Prime Bank Ltd.	40.00	8.2500%	335.00
9.	Southeast Bank Ltd.	40.00	8.2500%	375.00
10.	Mutual Trust Bank.	35.00	8.2500%	410.00
11.	Jamuna Bank Ltd.	35.00	8.2500%	445.00
12.	LBFL	5.00	8.2500%	450.00
13.	ILFSL	5.00	8.2500%	455.00
14.	IPDC	5.00	9.1100%	460.00
15.	National Bank Ltd.	40.00	9.2500%	500.00

**Table 4 : Liquidity position of the scheduled banks  
(As of end December, 2011)**

Bank Group	(Tk. in crore)					
	Cash in tills plus Balances with Sonali bank	Balances with Bangladesh Bank	Unencumbered Approved Securities	Total liquid assets	Required liquidity (SLR)	Excess liquidity
	1	2	3	4=1+2+3	5	6=4-5
State owned Banks	1407.60	7815.55	28423.63	37646.78	20625.72	17021.06
Private Banks (Other than Islamic)	3951.20	13965.88	35001.08	52918.16	37389.27	15528.89
Private Banks (Islamic)	1342.45	7479.76	3003.32	11825.53	8167.33	3658.20
Foreign Banks	432.78	4830.93	4008.76	9272.47	5691.11	3581.36
Specialised Banks*	305.21	1253.53	949.00	2507.74	1994.65	513.09
<b>Total</b>	<b>7439.24</b> (+6.52)	<b>35345.65</b> (+30.96)	<b>71385.79</b> (+62.53)	<b>114170.68</b>	<b>73868.08</b>	<b>40302.60</b>

**Source :** Major Economic Indicators, MPD, BB

*Note :* Figures in brackets indicate sectoral share in the total liquid assets

\* SLR does not apply to Specialised banks (except BASIC Bank) as exempted by the Government .

Mentioned auction procedure of Bangladesh Government Treasury Bonds (BGTB) and T Bills may be changed over time according to the overall liquidity perspective of the economy. New auction procedure effective from August, 2012 can be found in Table-7.

Effective from August, 2012 BB introduces 12 PD banks new underwriting obligations and mandatory allocation for 25 non PD banks in auction of Government Treasury Bills and Bonds. According to the revised auction procedure 12 PD bank will assume 60% and 25 non PD banks will assume 40% considering their total demand and time liabilities (TDTL) of the unsubscribed amount of auction. Among 60% of the notified amount 12 PD banks amounts 50% will be distributed according to TDTL and rest 50% will be distributed equally.

Following new auction procedure Tk. 250.00 crore has been considered as successful bids in a particular auction against notified amount Tk. 650.00 crore of 10-year BGTB. Devolvement amount on Bangladesh Bank for instance is Tk. 1.10 crore. BBs assumed amount depends on monetary indicators of the economy

**Table 5 : Auction of Treasury Bond**

Sl no	Name of BIDDER	Offered amount (Core-Tk.)	Offered Yield	Cum. offered amount	Calculated Price of the bond (per Tk.100)	Premium payable (in Tk.)	Half yearly coupon amount in Tk.
1.	Sonali Bank Ltd.	45.00	8.2400%	45.00	100.0403	181350	18562500
2.	Agrani Bank Ltd.	45.00	8.2500%	90.00	100.0000	0	18562500
3.	Janata Bank Ltd.	45.00	8.2500%	135.00	100.0000	0	18562500
4.	NCCBL	40.00	8.2500%	175.00	100.0000	0	16500000
5.	AB Bank Ltd.	40.00	8.2500%	215.00	100.0000	0	16500000
6.	Uttara Bank Ltd.	40.00	8.2500%	255.00	100.0000	0	16500000
7.	Mercantile Bank Ltd.	40.00	8.2500%	295.00	100.0000	0	16500000
8.	Prime Bank Ltd.	40.00	8.2500%	335.00	100.0000	0	16500000
9.	Southeast Bank Ltd.	40.00	8.2500%	375.00	100.0000	0	16500000
10.	Mutual Trust Bank.	35.00	8.2500%	410.00	100.0000	0	14437500
11.	Jamuna Bank Ltd.	35.00	8.2500%	445.00	100.0000	0	14437500
12.	LBFL	5.00	8.2500%	450.00	100.0000	0	2062500
13.	ILFSL	5.00	8.2500%	455.00	100.0000	0	2062500

**Table 6 : Distribution to PDs**

14.	IPDC	5.00	8.2500%	460.00	100.0000	0	2062500
15.	National Bank Ltd.	40.00	8.2500%	500.00	100.0000	0	16500000

observed by the auction committee. In the auction **unsubscribed** amount 60% of Tk. 398.90 crore [Total auction amount 650.00 - 251.10 (auction amount 250.00 + devolve amount on BB 1.10 )] or Tk. 239.34 crore was distributed to 12 PD bank and 40% or Tk. 159.56 crore was distributed to the 25 non-PD bank. It may

**Table 7 : New auction procedure of 10 year BGTB**

Particulars	Bids offered				Bids accepted			
	Total bids	Cumulative offered amount (Crore-Tk)	Minimum offered yield	Maximum offered yield	Total bids	Cumulative accepted amount (Crore-Tk)	Amount payable by bidder	Coupon rate
	1	2	3	4	5	6	7	8
10-year BGTB	08	79.63	11.7500 %	12.1000 %	05	250.00	25000000.00	11.75%
Devolvement on BB						1.10	11000000.00	
Devolve/Distributed to PD						239.34	23934000.00	
Devolve/Distributed to non-PD						159.56	15956000.00	
<b>Total</b>	<b>08</b>	<b>79.63</b>			<b>05</b>	<b>650.00</b>	<b>650,00000.00</b>	

be noted that PD bank’s 50% of Tk. 239.34 crore was distributed according to the underwriting obligation of each bank considering total demand and time liabilities. Rest 50% was equally distributed to the 12 PD bank. The same procedure is applicable for Government Treasury Bills.

**Calculation procedure of Treasury Bond**

**Bond Pricing (yield based multiple price auction) :** In order to get bond price we can use the insert function of Microsoft Excel menu selecting Price option (settlement, maturity, rate, yield, redemption, frequency, basis). Incorporating relevant data in the particular field we obtain the Price (15-Feb-12,15-Feb-17,10%,10%,100,2,1)

Here,

Settlement= Security’s settlement date: 15-Feb-12 (on which the security is bought or sold:1day added for leap year).

Maturity=Maturity date: 15-Feb-17(the date when security expires).

Rate= Security’s annual coupon rate: 10% (cut off yield rate of particular auction).

Yield= Security's annual yield: 10% (quoted by the bidder in a particular auction).

Redemption= 100(face value).

Frequency= 2 (for semi-annual coupon rate).

Basis=1(actual/actual).

Indistinguishable yield and coupon rate (10%) will lead the bond price at par (Tk.100.00). Stated 9.50% yield and 10% coupon rate will resolve bond price at Tk.101.95 (premium). In case of 10.50% current yield and 10% coupon rate the bond price will be Tk.98.09 (discount). Tag along mark to market system we can evaluate the bond price according to changing yield. In the amortized cost system we need to deduct premium 1.95(101.95-100) over the remaining life time of bond using straight line or effective rate method to reach bond face amount Tk.100 in the balance sheet of a company. Mark to market method is used in Bangladesh for held for trade securities (HFT). Amortized cost system is used for held to maturity (HTM) securities. For statutory liquidity requirement (SLR) of BB banks can use up to 85% HTM and 15% HFT government securities (unencumbered approved securities). This requirement may be transformed depending on regulator (BB).

The following table illustrates the effective interest rate method of amortizing Tk.4100 (premium) on a corporation's bonds payable (Table-8).

For mark to market and amortized cost system company can use extrapolation and interpolation method to get bond yield. Certain amount of government outstanding blocked debt taken through overdraft from BB can also be amortized following 10 years schedule improving the balance sheet of BB.

#### **Extrapolation of bond yield rate**

Due to lack of secondary market the yield for 2.5 year of a 5 year bond using yield curve rate of related tenure can be premeditated as:

5year yield(11%) – ((10 year yield(12%)-5 year yield(11%))/10-5)×2.5 (period passed:2+0.5(26weeks/52weeks).  $11 - (((12-11)/5) \times 2.5) = 10.50\%$

#### **Interpolation of bond yield rate**

Yield for 18 year of a 20 year bond with 2 year remaining maturity.

We need to calculate 3 year (5(class interval of 5,10,15,20 year bond)-2) bond yield and add with 15 year bond to dig up the 18 year bond yield (18=15+3).

15year yield(12%) + ((20 year yield(13%)-15 year yield(12%))/20-15)×period remaining(3 year).  $12 + (((13-12)/5) \times 3) = 12.60\%$ . Example of yield curve is shown in Figure-1.



**Table 8 : Amortization of Bond**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Date	Interest Payment Stated 4.5% x Face	Interest Expense Mkt 4% x Previous BV in G	Amortization of Bond Premium C minus B	Balance In Bond Premium Account	Balance In Bonds Payable Account	Book Value of the Bonds F plus E
	Credit Cash	Debit Interest Expense	Debit Bond Premium			
Jan 1, 2010				4,100	100,000	<b>104,100</b>
Jun 30, 2010	4,500	4,164	(336)	3,764	100,000	<b>103,764</b>
Dec 31, 2010	4,500	4,151	(349)	3,415	100,000	<b>103,415</b>
Jun 30, 2011	4,500	4,137	(363)	3,052	100,000	<b>103,052</b>
Dec 31, 2011	4,500	4,122	(378)	2,674	100,000	<b>102,674</b>
Jun 30, 2012	4,500	4,107	(393)	2,281	100,000	<b>102,281</b>
Dec 31, 2012	4,500	4,091	(409)	1,872	100,000	<b>101,872</b>
Jun 30, 2013	4,500	4,075	(425)	1,447	100,000	<b>101,447</b>
Dec 31, 2013	4,500	4,058	(442)	1,005	100,000	<b>101,005</b>
Jun 30, 2014	4,500	4,040	(460)	545	100,000	<b>100,545</b>
Dec 31, 2014	4,500	3,955	(545)	0	100,000	<b>Tk.100,000</b>
Total	45,000	40,900	( 4,100)			

Lower interest rates of yield curve exemplify higher book value of HFT securities of banks and financial institutions. Subsequent higher interest rate increase the duration (discussed later) of bonds and increase the volatility.

### Dirty price and clean price of bond

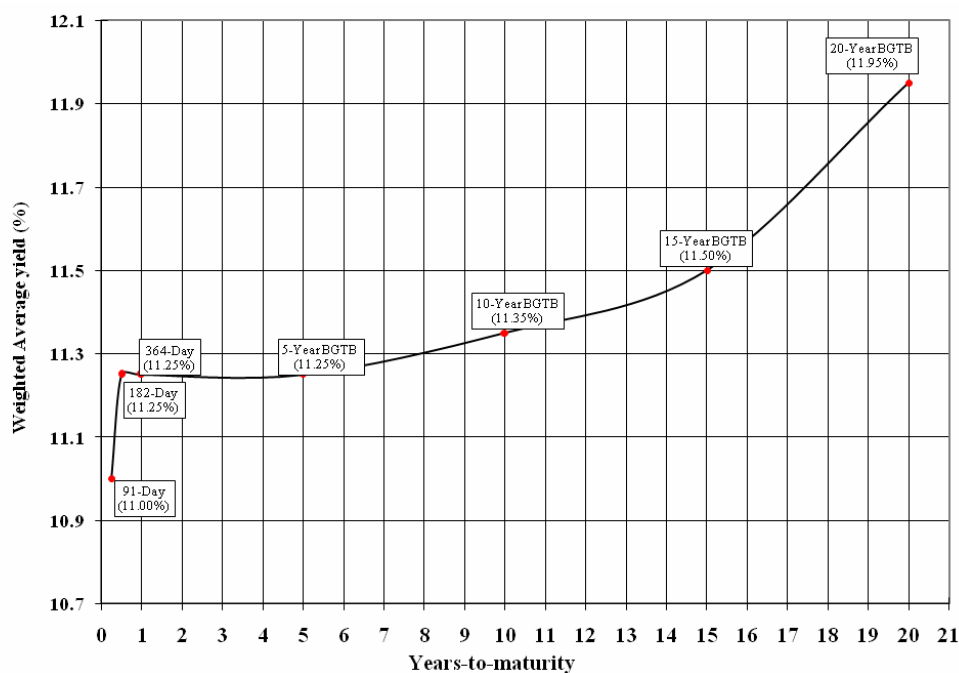
On the basis of coupon rate 10% and 9.50% current yield with certain time holdings the dirty price of bond is Tk. 101.95. After 60 days of holdings if the bond is sold the buyer of the bond need to pay 60 days accrued interest of Tk. 1.64 and the clean price of the bond will be Tk.100.31.

A corporate bond has a coupon rate of 7.2% and pays 4 times a year, on the 15th of January, April, July, and October. It uses the 30/360 US day count convention. A trade for 1,000 par value of the bond settles on January 25. The prior coupon date was January 15. The accrued interest reflects ten days' interest, or Tk.2.00 (7.2% of 1,000 \* (10 days/360 days)).

The full value of the bond is set by the market at Tk.985.50. The following calculation illustrates the values of related terms. The market convention for bond

### Figure-1: Yield curve of Treasury Bills & Bonds

Figure 1 : Yield curve of Treasury Bills & Bonds (as of February 20, 2012)



price assigns a dirty price of Tk.98.55 to the trade, not 0.9855. This is sometimes referred to as the price for 100 par value.

### **Bond Pricing Example**

#### **Bangladesh Government Islamic Investment Bond**

Government issues bond against the pool of funds formed by the Islamic banks and individuals to develop money market of this sector. Islamic banks and financial institutions are provided money up to 180 days against this pool of funds. The return of the bonds depends on profit or loss in line with the Islamic Shariah savings rate. The tenor of Islamic bond is 6-month, 1-year and 2-year. This bond is eligible for maintaining SLR. Islamic banks are need to maintain 11.50% SLR of which 6% CRR. The outstanding amount of Islamic bond is Tk.3008.40 crore at the end of February, 2012 includes unutilized funds of Tk.4.92 crore.

#### **Other Government Bonds**

Government also issued various bonds to supplement loanable funds for specialized banks and financial institutions. Furthermore, several bonds were also issued to mobilise funds for a number of public sector organisations like T&T Board and Bangladesh Biman. Bonds issued may be non-negotiable in nature.

Term	Value
Full Market Value	Tk 1,000
Dirty Price	Tk.985.50
Accrued interest	98.55
Flat market value	Tk.983.50
Clean price	98.35

Bearing in mind the financial aspect government can issue bond for instance in favour of state owned enterprises impacting BB and DMBs balance sheet. Since there is no secondary market in the country the holders of these bonds need to wait in anticipation of the maturity date for encashment.

#### **Basel II capital adequacy requirement of government bonds**

According to Basel II risk weighted asset of Tk. 100 value 5-year government treasury bond with 2-month remaining maturity for instance is Tk. 2 (100×0.20%×10) using standardized approach. To arrive this number 0.20% risk factor for 2-month remaining maturity is multiplied by conversion factor 10

(capital asset ratio) with base amount. Bank is needed to keep 10% of risk weighted asset i.e. Tk 0.20 in Tier 1 for minimum capital requirement. DMBs HFT securities need to calculate in the trading book and HTM need to report in banking book. Calculation of HFT treasury bills and bonds is needed to incorporate in the trading book rather banking book to address general market risk. The specific risk of treasury bills and bonds is zero. Pillar 1 of Basel II deals with minimum capital asset requirement of risk weighted asset of Tier 1 and Tier 2. Pillar 2 deals with supervisory issues addressing related risk for adequate capital asset requirement. Pillar 3 of Basel II reflects disclosure issues of banks and financial institutions.

**Stress testing of government securities :** Rise in interest rate at 1% level will decrease the price of bills and bonds used as base. Fall in risk weighted asset of bills and bonds due to lower base surfacing from market will lead to maintain lower capital in the DMBs balance sheet. Lower capital in the balance sheet will condense the capital asset ratio (CAR). Further rise in interest rate at 2% or 3% level eventually may lower the CAR below 10. All these depend on market rate of HFT government securities. It may be mentioned that CAR below 10 according to Basel II will expose the bank as vulnerable.

**Duration of bond :** Government bond with a yield to maturity of 8.00%, a par value of Tk.100, a coupon rate of 10%, and a cash-flow frequency of 2 time(s) per year will have a duration of 4.10 years. Duration measures how long, in years, it takes for the price of a bond to be repaid by its internal cash flows. DMBs need to consider it cautiously, as bonds with higher durations reflect more risk and have higher price volatility than bonds with lower durations.

Duration GAP (DGAP) impact the market value of equity and overall position of the bank. DGAP crop up combining weighted average duration of assets and liabilities of which investment of government securities are integrated. Formulation of DGAP:

$DGAP = DA - (MVL/MVA) \times DL$  [DA=Duration of asset; DL= Duration of liability; MVL= Market value of liability and MVA= Market value of asset].

$$DGAP = 3.07 - (10000 / 11000) \times 1.62 = 1.60$$

Longer DGAP causes larger change in the market value of DMBs equity. 1% rise in interest rate will reduce the market value of equity equivalent to Tk. 161.47 crore impacting balance sheet of banks as follows:

$$\begin{aligned} & ?MVE(-DGAP) \times (?i/(1+y)) \times TA \\ & = -1.60 \times (0.01/(1+0.09)) \times 11000 = -161.47 \text{ crore} \end{aligned}$$

## Chapter III

### OMO and monetary policy

PDs and non PD banks submit bid for Repo and special repo to the BB depositing government securities as collateral treating outright sale with a commitment to repurchase it after certain time. BB can chain monetary policy by buying and selling treasury securities outright using repo and special repo. Liquidity Support Facility (LSF) is provided to PDs only against government securities treating as collateral (encumbered securities). These tools are using by BB for day to day liquidity management impacting short term interest rate. Buying collateral increases the amount of money in the market and lowers interest rates, and selling collateral has the opposite effect. In repo operation BB can sale collateral as tools of OMO with better market timing subject to outright purchase. Repo and Special Repo are provided by the BB to Primary Dealers (15 PDs) and non-PD banks with 7.75% and 10.25% rate as outright sale/buy. LSF is provided to 15 PDs only with 7.75% rate based on their collateral without treating outright sale/buy. Hence, the seller bank can use these mortgaged securities in the SLR by reason of unencumbered approved securities mode. In order to get LSF facilities from BB 15% and 5% margin will be applicable against collateralised government treasury bills and bonds. Government securities both distributed and purchased over 2 months and 15 days holdings by the PDs are not eligible as collateral for LSF. Change in market interest rate will also impact the book value of the PDs in case of LSF. BBs reverse repo is described in terms of the other party's view. Reverse repo mop-up the liquidity virtually with no risk in terms of taking money from other party. BB does not provide any collateral in this regard. Details of Repo, Reverse repo and LSF are made known in Table-9 and 10.

### Repo operation

Repo is used for day to day liquidity management. Usually it is ranged from 1-7 Days. Bidders submit their bids and the auction committee encompassing high official of BB agree on the amount.

### Calculation of repo and Reverse repo rates

Taka interest = Principal x Repo Rate x (Repo Term in days/365 days)

Tk.0.207=Tk.1000 x0.1080 x (7/365)

The repo rate is the annualized interest rate of the transaction:

Repo Rate = Taka interest/Principal x 365/(Repo Term in days)

10.80%=Tk.0.207 / Tk.1000 x365/7. Special repo rate for 1-3 Day tenor is 10.75% and for 4-7 Day tenor is 10.80%. BB time to time amends the repo and reverse repo rate, which is used as policy rates.

**Table 9 : Repo auction**

Auction date	Tenor	Bidders	No. of bids	Received amount	Accepted amount	Repo rate (%)	Outstanding amount
23/11/11	1-Day	Repo to PD's /Non PDs	11	31,979.32	127.92	7.75	
	7-Day	Special Repo to PD's /Non PDs	6	1,807.00	1,200.00	10.80	5,616.92
	1-Day	LSF to PD's	13	4,289.00	4,289.00	7.75	
	Total :		30	38,075.32	5,616.92		

Reverse repo rate (5.75%) is 200 basis points lower than Repo rate (7.75%) in Bangladesh. Special repo provides to PDs and non PDs, those require money in the late working hour in a day. They are also in need of money for special reason. Special repo rate of higher tenor 10.80% is applied as penalty for maintaining of

**Table 10 : Reverse repo auction**

Auction date	Tenor	Bidders	No. of bids	Received amount	Accepted amount	Reverse Repo rate (%)	Outstanding amount
23/11/11	1-Day	Standard Chartered Bank	1	100.00	100.00	5.75	100.00

SLR. Bank rate (5%) with additional 5% totalling 10% rate is applicable for CRR penalty. Reverse repo rate is persist for taking loan of the government form BB. Thus these rates have due value in the economy.

### **Bangladesh Bank Bill**

Bangladesh bank bill is used to mop-up the liquidity from the banking system. To dry up the excess liquidity and creating high demand of Taka against foreign currency BB bill may be used. At present 30-Day Bangladesh Bank bill is in use as operational tool. The procedure of BB bill is synonymous to government treasury bills. Only bank can participate in the BB bill auction. The minimum face value of the government securities is Tk. 10.0 lac. Total applied amount of the securities should be divisible by Tk.10.0 lac (Tk. one million). Shortfall of excess

reserves may augment inter-bank call money rate (Table-11). It also increases the overall interest rate.

### Foreign exchange sale/purchase by BB

BB uses prudently this policy in order to maintain exchange rate. Sale of foreign exchange dwindle the liquidity lowering demand of foreign exchange (Table-12).

**Table 11 : Reserve Money Excess/ Shortfall**

(in million Tk.)

Date	Bank Notes	Govt. Notes and coins	Currency in circulation I= (a+b)	Local Curre. A/C II	F.C. clearing A/C III	RM IV=(I+II + III)	CRR V	Excess/shortfall of CRR VI=(II-V)	Inter-bank call money rate (WAR)
	a	b							
10/01/12	647865	6725	654590	257456	912046	979796	274375	-16919	20.15
11/01/12	648971	6725	655696	248450	904146	974707	274630	-26180	20.06
12/01/12	650225	6736	656961	250821	907782	984007	274630	-23809	20.19
15/01/12	650788	6736	657524	248245	905769	976127	274630	-26385	19.08

*Source: Key monetary indicators, Monetary Policy Department, BB.*

Banks are authorised to uphold open position limit, which is 15% of their risk weighted assets of Tier 1 and Tier 2 of Basel II. Individual banks excess holdings weigh against limit is mandatory to sale BB. Banks purchase more than limit refers to overbought. Oversold indicate excess sell comparing holding limit. At the forefront banks foreign exchange purchase is termed as long position. Banks selling foreign currency in advance intended for import payment, which is not in banks hand, is known as short position. Short position is uncovered position. Net position of banks arise summing long and short position. Higher amount of short position US\$-637.15 million direct to rise the inter-bank weighted average foreign exchange rate (WAR) at Tk. 82.3906 pointed out in Table-13. Making an allowance for the banks position BB operates sale/purchase of foreign exchange.

**Table 12 : Foreign Currency Transactions by Bangladesh Bank**

(million US\$)

FY/Date	Buying			Selling		
	Currency	Amount	Taka	Currency	Amount	Taka
2010-11	US \$	316.50	21994.01	US \$	1279.00	91307.66
03-1-12	US \$	Nil	Nil	US \$	30.00	2461.50

**Table 13 : Overall Foreign Exchange Position of Commercial Banks**

(million US \$)

Date	Open position Limit (Approved)	Net position Balance*	Inter-bank foreign exchange market rate (WAR)
02-01-12	809.76	-580.65	82.0063
03-01-12	809.76	-680.35	82.0327
04-01-12	809.76	-604.14	82.0843
05-01-12	809.76	-637.15	82.3906

\*Net position of Long and Short. WAR= Weighted average exchange rate at Taka.

## Chapter IV

### Conclusion

Government debt management brings together fiscal and monetary policy to achieve economic growth. Government borrow money through treasury bills and bonds to execute ADP resulting debt from the banking system. In a nutshell, government have access to DMBs and BB by selling treasury bills and bonds paying interest and eventually pay back the loans. This investment is duly shown in the balance sheet of the DMBs, which is influenced by market rate. As a result operational procedure and economic consequence is vital for banks. BB uses repo, reverse repo and selling/buying of foreign exchange for retaining day to day liquidity and external competitiveness of Taka. In repo operation BB can use collateral as tools of OMO with better market timing subject to outright purchase. Buying collateral increases the amount of money in the market and lowers interest rates, and selling collateral has the opposite effect.

Government debt needs to be preserved in terms of amount and rate. Proper debt servicing is vital under a wide range of fluctuations of the economy. At the same time effective ratios of public debt to GDP and to tax revenue necessitate to be continued. Proper revenue collection will rationally impact fiscal and monetary policy reducing income inequalities for poverty alleviation. Certain amount of blocked government outstanding debt taken through overdraft from BB can also be amortized following 10 years schedule for instance improving the balance sheet of BB. Gradual offload of current government debt using treasury bills following securitization may lower the monetary base with higher money multiplier maintaining desired rates. As a consequence debt management and OMO has due insinuation in monitoring interest rate, exchange rate and inflation endorsing economic growth.



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