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Editorial Notes

Non-performing Loans (NPLs) of the banks have gone up and are on the rise both in volume and share-per cent and becomes a concern of all. Banks' NPL rise by more than 18 per cent to Tk. 1.1 trillion in the first quarter (Q1) of 2019 from Tk. 939.11 billion in the preceding quarter, defying the close monitoring and surveillance of the Bangladesh Bank. The share of gross NPLs in the total outstanding loans of the banks also rose to 11.87 per cent from 10.3 per cent in 2018 and 9.3 per cent a year back in 2017 and even taking into account of the amount of written off loans of around Tk. 0.5 trillion so far, the gross NPL ratio is more than 16.1 per cent of the loans. These rising NPLs of banks entail more credit risk and make the banking system vulnerable to the risk of failure unless it is systematically addressed by Bangladesh Bank and banks' management through extending risk-based supervision and bank risk management respectively. Despite restructuring and rescheduling of some of them with laxity, required provisions have to be maintained causing profitability of the banks in 2018 in terms of EPS to fall much more than that of last year. In other words, a large amount of NPLs increase a bank's provision requirement, reduce profitability, and eventually erode capital base leading to bank insolvency, which may trigger system-wide instability in the financial sector. On the other hand, higher non-performing assets along with rescheduled and restructured loans pushed up the overall stressed assets ratio as a percentage of total loans and advances outstanding in 2018. According to Financial Stability Report, 2018, the stressed assets ratio rose to 20.5 per cent at the end of December 2018 which was the highest in the past three years. This ultimately affects bank's ability to lend and banks facing liquidity problems as evident from higher advance-to-deposit (ADR) and rising call money borrowing rate.

The first article of this issue focuses on the policy analysis through estimating the central bank's reaction function to stochastic shocks, productivity, monetary policy and term of trade, using Dynamic Stochastic General Equilibrium (DSGE) model for Bangladesh and Sri Lankan economy. This article also analyses the behavior and sources of fluctuations of the three macroeconomic variables: GDP growth, inflation and policy rate. The empirically estimated central bank's reaction function suggests that both central banks of Bangladesh and Sri Lanka place more emphasis on inflation stabilization or price stability. The finding that productivity shock is more volatile than monetary policy shock in Bangladesh is also true for Sri Lanka. Output is also affected by the monetary policy shock. The main lesson derived from the exercise is that the approach to controlling inflation and increased GDP monetary transmission channel could be used because monetary policy shock affects both output and inflation.

The second article investigates empirically the sources of exchange rate movements of real and nominal exchange rates of US dollars against the domestic currency of Bangladesh, India, Sri Lanka and Pakistan by employing structural VAR model. In other words, this article examines the dynamic effects of real (resource endowments, technological advancement, and preferences) and nominal (money supply) shocks on exchange rate movements. The empirical analysis shows that the effect of a real shock on the real and nominal exchange rates is of a persistent nature for all countries, resulting in a long-run real appreciation. On the contrary, the effect of a nominal shock on nominal exchange rates demonstrate that nominal shock takes few months for decreasing response (depreciation) in nominal exchange rates in all countries. Moreover, real shock dominates nominal shock in real exchange rates series in all these countries and in nominal exchange rates in all countries except Sri Lanka. The findings of the paper suggests that the objective of monetary and exchange rate policies be to make an effort in offsetting the effect of real shock through sterilization of foreign exchange reserve outflow or raise interest rate for the purpose of economic stabilization in all these countries.

The third article examines the association between Remittances and Food Prices in Bangladesh by employing co-integration and VECM techniques. The results indicate that remittance inflows are positively associated with food inflation in Bangladesh. The article provides empirical evidence showing that remittances can induce food inflation of the recipient economies. It implies that remittances are more guided towards food consumption of recipient households. As inflation may have some welfare costs, policies should be designed to guide remittances from consumption motives to investment in productive sectors that causes real economic growth.

The last and final paper deals with examining the present status of training need assessment (TNA) in Banks and the readiness of banks about the implementation of TNA in the banking sector of Bangladesh. The survey-based study finds that commercial banks in Bangladesh need to put more efforts to either introduce or improve TNA, such as introduction of certificate program, manual based training, more on the job training, technology based training or e-learning, separate TNA form introduction etc., in order to derive maximum benefits from it.

Mahmood Osman Imam 30 May, 2019
Editor

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Policy Analysis Using Dynamic Stochastic General Equilibrium Model (DSGE): Evidence from Bangladesh and Sri Lanka

Dr. Sayera Younus*

Abstract

The main objective of this article is to estimate the central bank reaction function for the central bank of Sri Lanka and Bangladesh using the Dynamic Stochastic General Equilibrium (DSGE) model. This study is also to analyse the sources of fluctuations of the macroeconomic variables in Bangladesh and Sri Lanka. The models have three stochastic shocks, namely shocks to productivity, monetary policy and terms of trade. The sample period covered from 1991.Q1 to 2014.Q2. This model captures the behavior of the three key macroeconomic variables: GDP growth, inflation, and the policy rate. Bayesian estimation method is used to get the posterior means based on priors and the likelihood function. The conditional variance decompositions, smoothed shocks show that DSGE model captures the policy shocks in the data well. The main lesson that we derive from the exercise is that the effective approach to controlling inflation is the management of monetary policy for both the Bangladesh and Sri Lanka. Output is also affected by the monetary policy shock. Therefore, monetary policy plays a significant role in macroeconomic stability in the country.

Key words: DSGE, Policy Analysis, Macroeconomic Variables.
JEL Classification: E52, E62, F41

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*Dr. Sayera Younus is a Deputy General Manager of the Monetary Policy Department of Bangladesh Bank. Views expressed in this article are the author’s own and do not necessarily reflect the views of the central bank of Bangladesh.

I. Introduction

The objective of this article is to analyze policy through estimating the central bank re-action function to stochastic shocks using Dynamic Stochastic General Equilibrium (DSGE) model for the Bangladesh and Sri Lankan economy. Central banks in developed and developing economies have become increasingly interested in DSGE models over the past 20 years because of their usefulness for policy analysis and forecasting.

Volker Wieland (2008) highlighted that the DSGE model for monetary policy promises significant benefits for the policy making as it serves as an essential tool for a rational policy-making process. The advantage of modern DSGE model over traditional reduced-form macroeconomic models is that they are often thought to be difficult to use, opaque, theoretically inconsistent even if they had theory it was antiquated, poorly estimated, and subject to the Lucas Critique (1976). That is dynamism of private agents behavior changes using available information will lead to adjust their behavior in economic policy announcements are absent in the existing reduced form models (Zabczyk, 2012). Keeping this in the background an attempt has been made to develop DSGE models for Sri Lanka and Bangladesh economy by incorporating exact country-specific features to analyzing macroeconomic variables.

Currently many central banks, in both developed and emerging market economies (EMEs) have developed their own models and many others are beginning or are planning to do so. Chairman Bernanke of the FRB (Board of Governors of the Federal Reserve System) in his 2007 speech stated that '..Indeed, considerable progress has been made in recent years, at the Board and elsewhere, in developing dynamic stochastic general equilibrium (DSGE) models detailed enough for policy application. These models have become increasingly useful for policy analysis for the simulation of alternative scenarios'. Therefore, the goal of this study is to examine the effectiveness of DSGE model in analyzing major macroeconomic variables in Bangladesh.

Bangladesh Bank, the central bank of Bangladesh can use this type of model for policy analysis and forecasting macroeconomic variables particularly GDP, inflation, and the exchange rates and take prompt policy measures ahead of time. The results of the DSGE model may be used in monetary policy formulation, programming, stress testing and measuring the monetary policy transmission from the financial sector to the real sector. The Bangladesh Bank is yet to develop a structural macroeconomic model that is necessary to forecast and analyze transmission channels of shocks from the financial sector to the real sector and vice versa. Almost all the central banks are using this model for policy analysis and forecasting tools.

For example US Federal Reserve Bank (SIGMA), European Central Bank (NAWM), Sveriges Riksbank (RAMSES), Bank of Canada (ToTEM), Bank of England (BEQM), Central Bank of Chile (MAS), Central Reserve Bank of Peru (MEGA-D), Norges Bank (NEMO), Bank of Finland, Reserve Bank of New Zealand, Bank of Spain,Central Bank of Brazil, Bank of Thailand, Central Bank of China, State Bank of Pakistan, IMF.

However, there are limitations using this model for Bangladesh. Designing the model is relatively very demanding in terms of the required technical skills, which include the following: Knowledge of micro-foundations of macroeconomics. Mathematical skills (advanced calculus and dynamic programming) are necessary for understanding and designing DSGE models. Knowledge of more advanced estimation methods (e.g. Bayesian methods) is necessary and computer programming skills to estimate the model is needed. Even a simple extension involves complications for other equations.

In this regard an attempt has been made to estimate the central bank reaction functions and and analysis of macroeconomic variables in Bangladesh. Therefore, the plan of the paper is as follows: after introduction in Section-1, Section- II, present the literature review. In Section- III, the basic structure of Bangladesh and Sri Lankan economy is described followed by the basic structure of the Dynamic Stochastic General Equilibrium model in Section-IV. Section-V explains data, methodology used for estimation of DSGE model. Section VI analyzes the empirical results and finally Section-VII concludes the paper.

II. Literature Review

The Dynamic Stochastic General Equilibrium (DSGE) models are now widely used for empirical research in macroeconomics as well as for quantitative policy analysis for the purpose of monetary policy analysis and forecasting at central banks around the world (see Schorfheide, 2007a, 2007b, 2011, Hara et al. 2009, Tovar, 2008 Christiano et al., 2010). Besides, DSGE models are used in assessing various aspects of policy analysis such as after the recent global financial crisis academicians, researchers and central bank have used DSGE models including financial frictions to see the transmission channel of monetary policies for financial sector to real sectors. There are small, medium and large open and also closed economy DSGE models. These models are used for low-income, developing and emerging economies. Niestroj et al. (2013) estimated the extended version of canonical DSGE model to examine the impact of the quantitative easing on US economy for the sample period from 2008 to 2012. The authors extended the model by including financial frictions and liquidity premium. Negro et al. (2014), estimated time-varying weights in linear prediction pools, and used it to investigate the relative forecasting performance of dynamic stochastic general equilibrium (DSGE) models, with and without financial frictions, for output growth and inflation in the period 1992 to 2011 for the US economy. Negro et al. (2014) showed that a standard DSGE model with financial frictions available prior to the recent crisis successfully predicts a sharp contraction in economic activity along with a modest and protracted decline in inflation.

Merola (2014) provides a quantitative assessment of the impact of financial frictions on the U.S. and European countries business cycle using the model developed by Smets and Wouters (2003, 2005, 2007) by extending financial accelerator mechanism from 1967 to 2012 using Bayesian methods.

Rodrigo et al. (2011) estimated a DSGE model for a small open economy that incorporates financial frictions to analyze the consequence of the global financial crisis in 2008-09 on Chilean economy. Using DSGE model, Peiris and Saxegaard (2007) evaluate monetary policy tradeoffs in low-income countries such as for Mozambique in sub-Sahara Africa except South Africa. Ahmad et al. (2012) developed a closed economy DSGE model of Pakistan with informality both in the labor and product markets consistent with the micro-foundations of Pakistan’s economy while Adnan and Khan (2009) estimated a small open economy DSGE model for Pakistan using Bayesian simulation approach. Hamann, Perez and Podriguez (2006) developed a DSGE model for the small open economy of Colombia. Liu (2006) designs DSGE based New Keynesian framework to describe the key features of a small open economy, particularly the model focuses on the transmission mechanism of monetary policy to provide a tool for basic policy simulations.

Sadeq’s (2008) paper uses a small open economy DSGE model for central Europe Countries in transition, EU-15: Czech Republic, Hungary, Poland, Slovakia, and Slovenia. Grabriel et al. (2010) developed closed economy DSGE models of the India and US economy and estimated the models by Bayesian Maximum Likelihood method using Dynare. A number of papers presented at the workshop on DSGE models organized by Bank Indonesia and the Bank for International Settlements (Bali, 2008) showed different aspects of using DSGE model. For example, Tanboon (2008) simulated DSGE model for Thailand’s economy consisting of four main agents, namely households, firms, banks and government and found that the interest rate and the productivity shocks have significant impacts on Thailand’s capital, investment, wage and consumption basket while Santoso (2008), presented the Indonesian model, GEMBI, emphasizing the country-specific characteristics such as data accuracy, specific but dominant economic sectors, credibility of monetary and fiscal policies, and markets.

Chow et al. (2013) using a Dynamic Stochastic General Equilibrium Model (DSGE) examined for the sample period from 1985 to 2009, whether monetary regime choice for Singapore economy matters in influencing macroeconomic variables such as GDP growth and Inflation. There are four sectors, household, production, external and Government. The paper considered seven shocks such as productivity, government spending, foreign GDP, world interest rate, export price inflation import price inflation and risk premium. The results show that exchange rate rule had a comparative advantage when the major sources of real fluctuations are from exports shocks while Taylor rule performed better when sources of shock are from domestic productivity. The exchange rate rule also dominated the Taylor rule for reducing inflation persistence.

A research task force working group on the transmission channels (RTF-TC) between the financial and real sectors of the Basel Committee on Banking Supervision of Bank for International Settlement has attempted to improve existing DSGE models to use for policy analysis by developing a stylized model of the banking sector.They found that in the presence of financial frictions, aggressive interest rate cuts are required to offset adverse financial shock which helped DSGE models to better address fundamental policy issues, such as the overall importance of financial sector shocks in explaining the business cycle and the role of monetary policy and/ or prudential regulation to avoid or mitigate financial crises.

III. The Structure of the Bangladesh and Sri Lankan Economy

Sri Lankan got independence in 1948 from the British authority while Bangladesh gained independence from Pakistan in 1971. Sri Lanka has achieved Gross Domestic Product (GDP) growth on an average of 6.5% during the past 4 years while Bangladesh also grew by an average of 6.2 percent during the same periods mainly backed by strong domestic demand and the financial inclusion drive of the Governments. Sri Lanka economy worth $64.21 billion on an average during the period of 2011-2014 and a per capita GDP of about $3092 supported by relatively small population (of about 20 million) compared with Bangladesh, while Bangladesh economy worth $155.31 billion in nominal terms with the relatively large population size of 155.59 million and per capita GDP of on average $994 during the same period. Total investment as a percent of GDP in Sri Lanka is higher than Bangladesh while Bangladesh save more than Sri Lanka. It took 65 years for Sri Lanka to reached $1,000 per capita income in 2004, while Bangladesh reached $1088 level in 2013 after 42 years of her independence.

At the time of independence, the agriculture sector accounted for almost 50 percent of GDP in Sri Lanka which was 38.6 percent for Bangladesh. In 2013, the agriculture sector accounted for only 10.8 percent of GDP for Sri Lanka and 18.7 percent for Bangladesh. The industry and service sectors accounted for 19.6 and 36.9 percent of GDP respectively in Sri Lanka and 15.5 percent and 45.9 percent respectively in Bangladesh during the same periods. In 2013, the share of industry and service sectors had increased significantly and reached to 32.5 percent and 56.8 percent of GDP respectively in Sri Lanka and 32 percent and 49.3 percent in Bangladesh.

The Sri Lankan economy has initiated a broad range of liberalization policies since 1977. The policy reform package contained various measures and strategies such as trade liberalization, exchange rate realignment, financial sector reforms, etc. notably, the financial sector reforms package included several steps such as changes to interest rate policy, lifting entry barriers in the banking sector, phasingout interest rate subsidy schemes, encouraging market-driven financial products, and strengthening the regulatory framework (Perera, A., 2014).

In 2001, Sri Lanka marked a significant step by moving towards a free-floating exchange rate system and subsequently modifying the monetary policy framework while placing greater emphasis on market-based monetary policy instruments. The Monetary Law Act was also amended in 2002 to streamline central bank objectives and to focus on two key objectives: economic and price stability and financial system stability. On the other hand, after experimenting with a socialist model of development during the early 1970s, Bangladesh has gradually moved toward a market-oriented strategy of development since the late 1970s. To achieve some socio-economic objectives, the monetary and banking sectors in Bangladesh has undergone a gradual transformation owing to different policy measures tried since its independence. It has undertaken significant economic reforms since the late 1980s and gained macroeconomic stability with a sustained economic growth of about 5.0 percent per annum reasonably.

To find a remedy for the distorted financial sector, a “National Commission on Money, Banking and Credit” was formed in 1984 in Bangladesh. The World Bank also provided funds to carry out a study on the financial sector. Following these initiatives, a comprehensive “Financial Sector Reform Programs (FSRP)” was put into operation in the early 1990s. The mission of the FSRP was to eliminate distortions from the financial sector.

Liberalization of interest rates and indirect control in monetary management were the main objectives of the program through privatization (allowing new private commercial banks to operate) and denationalization (selling out government banks to private entrepreneurs) of the financial institutions (as well as other real sector enterprises) started well before (in 1983) the adoption of stabilization and structural adjustment program by Bangladesh Government.[2]

Macroeconomic performance in both Sri Lanka and Bangladesh shows considerable similarity. It is evident that Bangladesh real GDP growth was less volatile than those of the Sri Lankan economy during 1980 to 2014. According to Figure-2, on average, real output variability (as measured by the standard deviation of real GDP growth) was declined from 2.30 percent to 1.40 percent during last decade compared with the previous decade.

Figure-1: GDP Growth Rates in Bangladesh and Sri Lanka

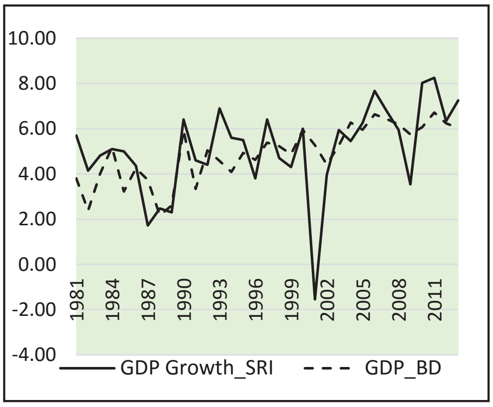
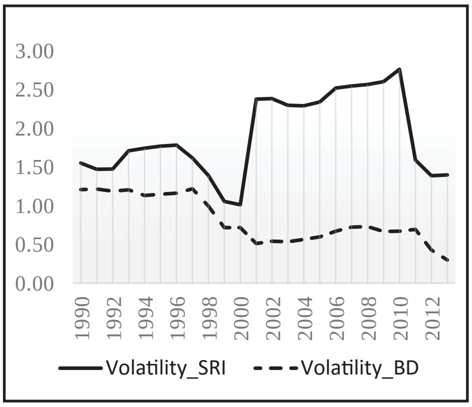


Figure-2: Volatility[3] in the real GDP growth.



On the other hand, Bangladesh was enjoying the relatively less volatile environment in the real GDP growth with the 0.54 and 0.30 percent volatility during the same periods.Volatility in money supply (as measured by the broad money) has also declined noticeably from 7.19 percent during 1993-2002 to around 2.74 percent during 2003-2013in Sri Lanka. The volatility in the money supply and Inflation of Bangladesh have also declined from 3.23 percent during these periods of 1993-2002 to 2.49 in 2003-2013 and 2.71 percent to 1.49 percent respectively during the same years.

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[2] *Financial Liberalization Theory of McKinnon and Shaw was the theoretical background of the Financial Sector Reform Program (FSRP)in Bangladesh. McKinnon and Shaw, in their works, argued in favor of removing distortions from the economy imposed by regulatory government policies. They proved that liberalization policy would make the financial system more efficient and effective. In line with this policy suggestion, the FSRP was designed to liberate the economy from government control, bring indirect control in monetary policy, enhance efficiency of public and private banks, and restoring order in the financial sector. The main targets of the Financial Sector Reform Program (FSRP) are outlined below: Liberalization of interest rates; Indirect monetary management; Implementation of capital adequacy requirement of commercial banks; Introduction of new policies for loan classification; Modernization of the banking sector and introduction of updated accounting system; Revision of the legal structure of financial sector; Development of capital market; Strengthening central bank's supervision; Improvement of overall management of the banking sectors with special emphasis on credit management; and Computerization of the central bank and nationalized commercial banks.*

[3] *Measured by the Standard Deviation.*

Both the economy have adopted reforms measures in monetary, banking sector to increase the effectiveness of monetary policy. In particular, as the Sri Lankan and Bangladesh had taken a range of economic and financial sector reforms since the 1980s with acceleration in the 1990s, transmission of monetary policy and its effectiveness may have improved considerably.

On average during the periods of 2011-2014, the growth of imports in Sri Lanka is higher than that of Bangladesh while exports growth is higher in Bangladesh than Sri Lanka although both country's imports are greater than exports, characterzing them as a trade deficit countries.

The main economic sectors in Sri Lanka are tourism, tea export, apparel, textile, rice production and other agricultural products. In addition to these economic sectors, overseas employment contributes highly in foreign exchange, 90% of expatriate Sri Lankans reside in the Middle East. In Bangladesh, the major exports items are woven garments, knitwear, other made textile articles, raw jute and jute goods, frozen foods. Besides exports, significant portions of the foreign exchange reserves come from remittances. Overseas employments accounts for the 10 percent of its GDP on average in Bangladesh. The major import items are capital machinery, petroleum oil, iron, raw cotton, etc. The current account balance is negative on average in Sri Lanka during the periods of 2000-14, while Bangladesh has current account surplus during these periods. The general government total expenditure is much higher in Sri Lanka than Bangladesh.

III.1 Monetary Policy Framework in Sri Lanka and Bangladesh

The Central Bank of Sri Lanka was established according to the Monetary Law Act No. 58 of 1949 (MLA) while Bangladesh Bank was established according to the Bangladesh Bank order, 1972. Both banks have similar mandate of stabilizing the domestic monetary value and the exchange rate of the respective countries vis-à-vis foreign currencies, promoting a high level of production, employment and real income and encouraging and promoting the full development of the productive resources of the country. In 2002, an amendment to the MLA redefined the objectives of the Central Bank of Sri Lanka whereby the multiple goals of the Central Bank were replaced with two goals: economic and price stability and financial system stability (Perera et al., 2014). According to the Bangladesh Bank order, 1972, Bangladesh Bank has authorized to manage monetary and credit system of Bangladesh with a view to stabilizing domestic monetary value and maintaining a competitive external par value of the Bangladesh Taka towards fostering growth and development of country's productive resources in the best national interest, which is substituted by the Bangladesh Bank (Amendment) Act, 2003.

Like other developing countries, the Central Bank of Sri Lanka, adopted a more directed approach during early 1980's to managing the economy by imposing direct controls on credit, interest rates and imposing strict exchange controls with a view to encouraging identified sectors in the economy. The liberalization of the economy in 1977 set the stage for the move away from direct instruments to more market oriented monetary policy instruments. In the 1980s, the Central Bank formally adopted a monetary targeting policy framework. The monetary policy framework of the Central Bank of Sri Lanka is designed to achieve its final objectives, by conducting monetary policy so as to maintain reserve money, the Bank's operating target, at a level that is consistent with a desired growth of broad money, the Bank's intermediate target (Perera, et al., 2014).

The Central Bank of Sri Lanka has refined its policy framework gradually towards an inflation targeting type monetary policy framework due to the development of the financial system and financial innovations during the early 2000s. In January 2001, Sri Lanka moved from a crawling band exchange rate regime to a floating exchange rate system. In March 2003, the Central Bank moved to a system of more active open market operations. In this new system, monetary policy is conducted to maintain reserve money around a targeted level while ensuring that the short-term interest rate is kept at a level that is compatible with the target of reserve money. Although reserve money continues to be the goal of monetary policy, there has been a shift towards the use of the interest rate corridor to signal the stance of monetary policy (Perera et al. 2014).

Similarly, in May 2003, a significant shift in the policy regime took place when Bangladesh entered into the flexible exchange rate regime. In 2002, Bangladesh gradually moved to more open market operations by introducing Repurchase (Repo) agreement and reverse repurchase agreement in 2003 to inject and absorb liquidity from the money market. Since 2006, BB has been announcing half-yearly Monetary Policy Statements (MPS) to anchor inflation expectations of economic agents and the general public. Currently, the formation of Monetary Policy Stance is based on extensive stakeholder consultations from the grassroots level up to the level of experienced professionals including past Finance Ministers /Advisers / Governors, think tanks and trade bodies. Bangladesh Bank has outlined the monetary policy stance through the Monetary Policy Statement based on an assessment of global and domestic macroeconomic condition and outlook.

III.2 Trends in Recent Monetary Policy in Bangladesh and Sri Lanka

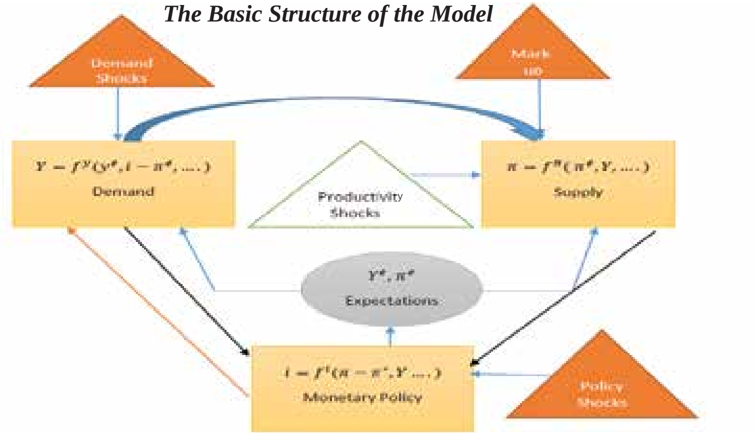
Monetary policy stance in Bangladesh was expansionary during FY04 that gradually become contractionary during the period of world commodity price hike in FY07-FY09. In FY10, all the interest rates came down to their lowest level and then gradually went up again during FY11-FY13.The similar trends showed in reserve money, M1 and M2, domestic credit and private sector credits.

Table A-3 below show mixed monetary policy stance in Sri Lanka. As opposite to Bangladesh all the interest rates showing upward trends during FY04 to FY07 reflecting contractionary monetary policy stance of the central bank of Sri Lanka. The reserve money, M1, M2, domestic credit and private sector credit growth was higher during these periods. However, during the period of financial crisis of FY07-FY09, the rate of interest came down compared with their previous level. Although the growth of reserve money, M1 and M2, domestic credit and private sector credits were showing contractionary monetary policy trends, the interest rates were lower compared with the previous levels showing opposite signal to the monetary policy stance of the central bank of Sri Lanka.

IV. The Model

RAMSES (Riksbank Aggregate Macro Model for Studies of the Economy in Sweden) have been used for forecasting and policy analysis in Sweden since 2005. Following Sveriges Riksbank (RAMSES), we assume that Bangladesh macro economy is built around three interrelated blocks: a demand block, a supply block, and a monetary policy block. In the supply, demand and monetary policy blocks have economic actors from household, firms, governments and the monetary authority. The equations define these blocks derived from micro-foundations. The agents from

The Basic Structure of the Model



Source: Sveriges Riksbank (RAMSES)

these sectors interact in the market that clears every period, which lead to the "general equilibrium". The basic features of DSGE models are the dynamic interaction between the blocks. Expectations about the future is a crucial determinant of today's outcomes.

IV.1 The Demand Block

- The demand block, the real activity (Y) is modeled as a function of ex-ante real interest rate and the expectations of the future action.
- The central idea of this block is that when the real interest rate is high household and firms would prefer to save than consume and invest.
- People are willing to spend more when future prospects are promising, regardless of the level of interest rates.

IV.2 The Supply Block

- ☐ In the supply block, the line connecting demand block to supply block show that the degree of activity emerging from the demand block, which is a critical input in the determination of inflation.
- ☐ The expectation of future inflation plays a significant role in the determination of inflation. In boom period, when the level of economic activity is high, firm increase wages to induce employees to work longer hours that in turn increases the marginal cost, putting pressure on prices and generating inflation.

IV.3 Monetary Policy Block

The demand and supply blocks determine output and inflation that in turn feed into the monetary policy block. The equation describes how the central bank sets the nominal interest rate, usually as a function of inflation and real activity. The central bank raises short-term interest rates when the inflation rises, and the economy is overheating as well as lower it in the presence of economic slack. In that way, monetary policy affects the real activity and through it inflation. The policy rule closes the circle. This gives us a complete model of the relationship between three key endogenous variables: output, inflation, and the nominal interest rate.

IV.4. Methodology-Bayesian

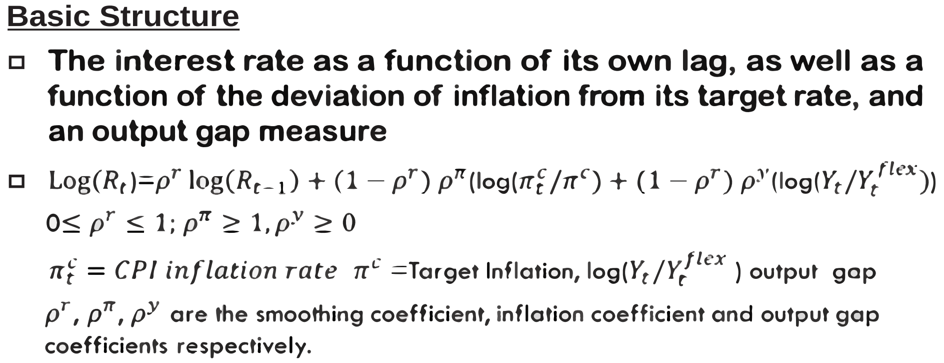
- Two building blocks - priors and likelihood functions - are tied together by Bayes' rule. We can combine the prior density and the likelihood function to get the posterior density.
- First, Priors are described by a probability density function.
- Second, the likelihood function represents the density of the observed data given the model and its parameters.
- One can assume potential priors by comparing the features and stylized facts of developed and developing economies.
- In some cases, we used the same prior’s means as in previous studies but chose larger or smaller standard deviations based on country perspectives, thus allowing the data to determine the parameters location.

Dynare is a Matlab frontend to solve and simulate dynamic models. Considering the lack of knowledge of central banks policy reaction function we used distributions as a standard open economy model for the smoothing coefficient and the forward-looking parameters and the feedback parameters. For the shock process, relatively larger prior means are chosen since Bangladesh, and Sri Lanka are small open economy and subject to large swings in the macroeconomic variables.

IV.5 Data

To estimate the parameters of the DSGE model, we used the data over the period 1991-2014 (Quarterly) for Bangladesh and from 1994Q1 to 2014Q4 for Sri Lanka. Quarterly data were de-seasonalized with Eviews X-11 program. For working with the model, the de-seasonalized logarithmic data were then filtered, with the Hodrick-Prescott (HP) Filter or by de-trending. HP filter real variables and de-trend nominal variables.

IV.6. Central Bank Reaction Function: Taylor Rule



Basic Structure

- **The interest rate as a function of its own lag, as well as a function of the deviation of inflation from its target rate, and an output gap measure**
- $\mathrm{Log}(R_t) = \rho^r \log(R_{t-1}) + (1-\rho^r)\,\rho^\pi(\log(\pi_t^c/\pi^c) + (1-\rho^r)\,\rho^y(\log(Y_t/Y_t^{flex}))$

  $0 \leq \rho^r \leq 1;\ \rho^\pi \geq 1, \rho^y \geq 0$

  $\pi_t^c = CPI\ inflation\ rate$ π^c =Target Inflation, $\log(Y_t/Y_t^{flex}$) output gap

  ρ^r, ρ^π, ρ^y are the smoothing coefficient, inflation coefficient and output gap coefficients respectively.

IV.7 Shocks and Observables

Three macroeconomic variables real GDP, inflation and the short-term interest rates are used as observables. The model contained three stochastic shocks: namely: Monetary Policy Shocks, Productivity and Terms of Trade Shocks (M, PXX, and YX).

IV.8. Empirical Results: Bangladesh

Table 1 show the results derived from DSGE model estimating central bank reaction functions for Bangladesh. The central bank reaction function using Taylor rule shows that current interest rate depends on lag interest rate, as well as a function of the deviation of inflation from its target rate, and an output gap measure. Table 1 shows that Taylor lag is a lag interest rate, which theoretical value is 0.50. However, in case of Bangladesh the magnitude turns out to be 0.89, which implies that Bangladesh Bank uses backward looking strategy while determining current short term interest rate.

The target rate of the estimated coefficient of inflation (taylor_inf) is 1.77 which is higher than its theoretical value of 1.50 implying that Bangladesh Bank put emphasis on inflation. The coefficient of output gap (taylor_y) is turned out to be below its prior mean which is 0.45. RHO_PXX, RHO_YX and psi_price are the autoregressive parameters of terms of trade, output and Calvo price which are also higher for Bangladesh. Therefore, the bottom line of this central bank reaction function is as follows :

Bangladesh places more emphasis on stabilizing inflation, i.e., price stability.

Table 1:Prior and Posterior estimates

Coefficient

Estimates	Priors Mean	posteriors Mean	90% HPD interval		priors Dist.	posteriors Std. Dev.
taylor_lag	0.50	0.89	0.87	0.90	beta	0.20
taylor_inf	1.50	1.77	1.49	2.04	norm	0.25
taylor_y	0.50	0.45	0.38	0.50	beta	0.20
RHO_PXX	0.50	0.94	0.92	0.95	beta	0.20
RHO_YX	0.50	0.51	0.18	0.81	beta	0.20
psi_price	0.50	0.59	0.51	0.67	beta	0.20

Notes: RHO_PXX, RHO_YX and psi_price, are the autoregressive parameters of terms of trade, output and Calvo price.

Standard Deviation of Shock

The standard deviation of shocks implies that which shock is more volatile for Bangladesh. Standard deviation measures the volatility of shocks. In this regard, the estimated volatility for the productivity shock is 0.11 which is much higher than its prior mean i.e., our expectations of 0.05. This implies that in Bangladesh productivity shock fluctuates more than monetary shocks and terms of Trade shock, which is 0.02 and 0.04 respectively. Therefore, the results implied that ***productivity shock is more volatile than monetary policy shock in Bangladesh.***

Table 2:Standard deviation of shocks

Estimates	Priors Mean	Posteriors Mean	90% HPD interval		priors Dist.	posteriors Std.Dev.
Monetary Shock	0.05	0.02	0.01	0.02	invg	4.00
Terms of trade shock	0.05	0.04	0.04	0.05	invg	2.00
Productivity shock	0.05	0.11	0.09	0.12	invg	4.00

IV.9. Conditional Variance Decompositions

The conditional shock decomposition of GDP showed that monetary policy shock dominated the variability of GDP at all of the horizons. The other shock which also matters is productivity.The conditional shock decomposition of inflation showed that monetary policy shock (epsilon_M) dominated the variability of inflation at all of the horizons followed by the productivity shock (epsilon_YX).

Table-3: ***Conditional Variance Decompositions***

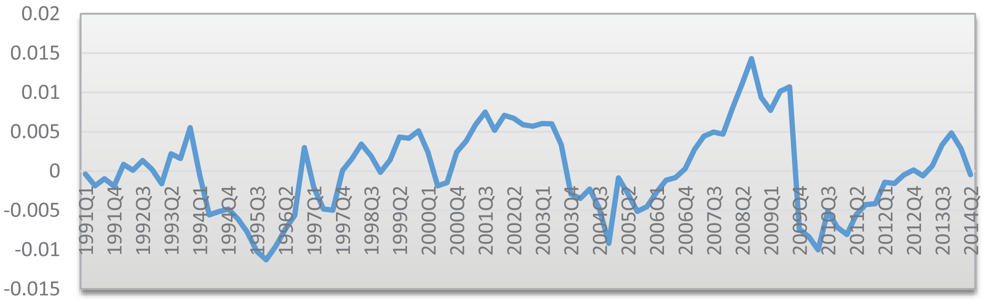
Shock	1	2	3	4	10
GDP					
epsilon_M	0.60	0.65	0.66	0.66	0.68
epsilon_PXX	0.69	0.08	0.09	0.08	0.08
epsilon_YX	0.33	0.29	0.27	0.27	0.25
Inflation					
epsilon_M	0.20	0.68	0.70	0.70	0.71
epsilon_PXX	0.06	0.06	0.06	0.07	0.07
epsilon_YX	0.11	0.24	0.21	0.21	0.21

Source: Authors own Estimation.

IV.10. Smoothed Shocks

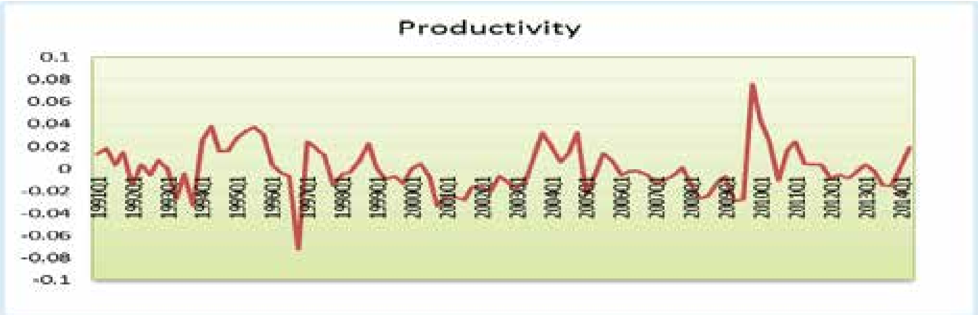
The smoothed shocks of monetary policy show that the economy of Bangladesh hit hurt by an adverse monetary policy shock during the period of 1994 to 1997 and also 2003 to 2006 during the periods of high commodity price and oil price increase and also after the global financial crisis.

Chart-2: Smoothed Shocks : Monetary Policy



The productivity shock was higher during 1994 to 1996, 2003 to 2005 and 2010.

Chart-2: Smoothed Shocks: Productivity



IV.10 Empirical Results: Sri Lanka

Table 4 show the results derived from DSGE model estimating central bank reaction functions for Sri Lanka. From Table 4, it is evident that the magnitude of the lag interest rate for Sri Lanka is 0.82, which is higher than its theoretical value of 0.50. This implies that the central bank of Sri Lanka uses backward looking strategy while determining current short term interest rate.

The target rate of the estimated coefficient of inflation (taylor_inf) is 2.02 which is also much higher than its theoretical value of 1.50 implying that like Bangladesh Bank, the central bank of Sri Lanka also put more emphasis on inflation or price stability. The coefficient of output gap (taylor_y) is turned out to be below its prior mean which is 0.48. RHO_PXX, RHO_YX and psi_price are the autoregressive parameters of terms of trade, output and Calvo price which are also higher for Sri Lanka.

Table-4: Prior and Posterior estimates

Parameters	Priors Mean	Posteriors Mean	90% HPD interval		Priors Dist	Posteriors Std
taylor_lag	0.50	0.82	0.80	0.86	beta	0.20
taylor_inf	1.50	2.02	1.75	2.34	norm	0.25
taylor_y	0.50	0.48	0.43	0.55	beta	0.20
RHO_PXX	0.50	0.93	0.91	0.95	beta	0.20
RHO_YX	0.50	0.50	0.17	0.80	beta	0.20
Psi_price	0.50	0.72	0.64	0.80	beta	0.20

Standard Deviation of Shock

The standard deviation of shocks measures the volatility of shocks. In this regard, the estimated volatility for the productivity shock is 0.12 which is much higher than its prior mean i.e., our expectations of 0.05, which implies that in Sri Lanka productivity shock fluctuates more than monetary shock and terms of trade shock, which is 0.03 and 0.04 respectively. Therefore, the results implied that productivity shock is more volatile than monetary policy shocks in Sri Lanka.

Table-5: Standard Deviation of Shock

Parameters	Priors Mean	Posteriors Mean	90% HPD interval		Priors Dist.	Posteriors Std
Monetary Shock	0.05	0.03	0.02	0.04	invg	4
Terms of trade shock	0.05	0.04	0.04	0.06	invg	2
Productivity shock	0.05	0.12	0.09	0.14	invg	4

The above Table-5 depicts that monetary policy shock is less volatile than other stocks in Sri Lanka.

Table-6: Conditional Variance Decompositions

Shock/Quater	1	2	3	4	10
GDP					
epsilon_M	0.66	0.72	0.74	0.74	0.74
epsilon_PXX	0.04	0.04	0.04	0.04	0.04
epsilon_YX	0.30	0.24	0.22	0.22	0.21
Inflation					
epsilon_M	0.20	0.70	0.73	0.73	0.74
epsilon_PXX	0.79	0.04	0.05	0.04	0.04
epsilon_YX	0.24	0.20	0.21	0.21	0.21

The conditional variance decompositions of GDP and inflation for the quarter 1, 2, 3, 4 and 10 for Sri Lanka shows that monetary policy shock matters for the Sri Lankan GDP and inflation. The above results (Table-6) implies that 66 percent variations in the GDP are explained by the monetary policy shock in the first quarter. In the 2nd and 3rd quarter the impact of shock increased. For the inflation although in the first quarter terms of trade shock dominated over monetary policy shock that reversed from the 2nd quarter and so on.

IV.11. Smoothed Shocks

Chart-4 shows that monetary policy of Sri Lanka was contractionary during the periods from 2000Q4 to 2004Q3 due to high commodity price and inflation which reversed during the period from 2004Q3 to 2008Q2 following the onset of global financial crisis. Chart-5 also shows terms of trade shock which is mixed and is not showing any definite pattern.

Chart-4: Smoothed Shocks: Monetary Policy Shock

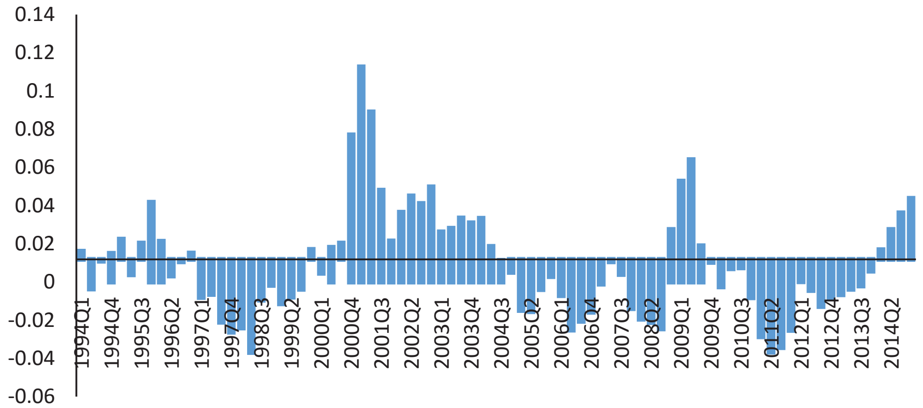


Chart-5:Smoothed Shocks: Terms of Trade Shock

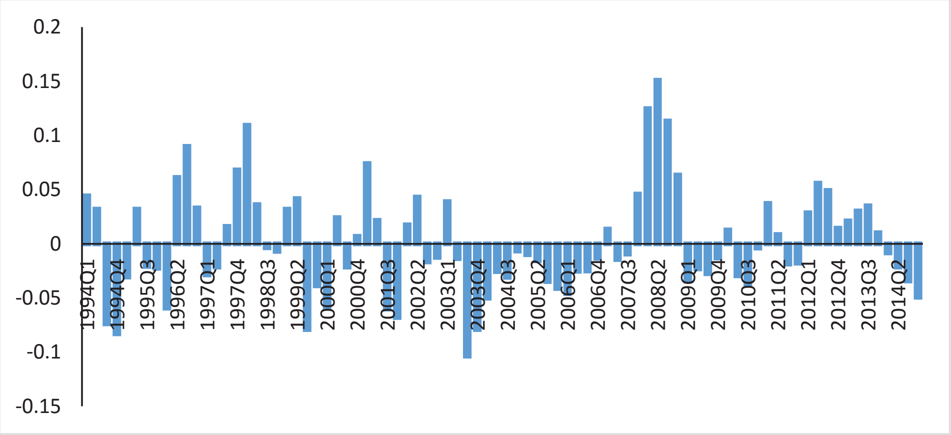
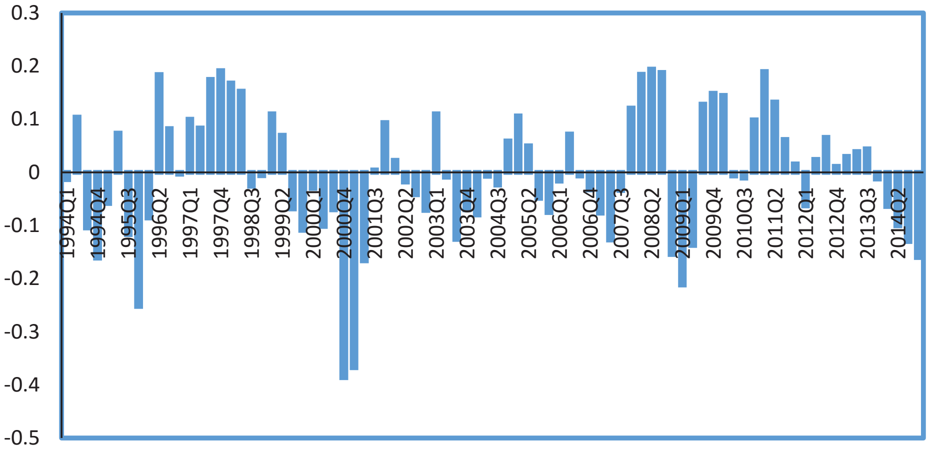


Chart-6: Smoothed Shocks: Productivity Shock



The productivity shock of the Sri Lankan economy shows that during the period of contractionary monetary policy, productivity was lower. This trend showed up again in 2006-07 and 2009 and also in recent times because of the crisis in the US and European countries.

VI. Conclusion

The intention of this study is to estimate the central bank reaction function for Bangladesh and Sri Lanka. Using quarterly data for the sample period from 1990 to 2014 this paper found that central bank of Bangladesh and Sri Lanka put more emphasis on inflation stabilization over growth. The results also supported by the cconditional variance decompositions, smoothed shocks of GDP and inflation. The DSGE model captures the policy shocks from the data well. The main lesson we derive from the study is that the approach to controlling inflation and increased GDP monetary transmission channel could be used because monetary policy shock affects both output and inflation. Therefore, monetary policy plays a significant role in the macroeconomic stability of Bangladesh and Sri Lanka.

Appendix

Table 1: Macroeconomic Performance (1980–2014): Sri Lanka and Bangladesh

Country	Subject		Average(1980-1990)	Average(1990-2000)	Average(2000-2010)	Average(2011-2014)
Sri Lanka	Gross domestic product, current prices	U.S. dollars (Billions)	6.17	13.30	29.03	64.21
Bangladesh			26.06	45.27	79.94	155.31
Sri Lanka	Gross domestic product per capita, current prices	U.S. dollars	396.75	759.03	1464.56	3093.12
Bangladesh			273.45	371.68	552.54	996.64
Sri Lanka	Real GDP Growth	Percent change	4.20	5.22	5.27	6.49
Bangladesh			3.73	4.80	5.83	6.14
Sri Lanka	Population (Millions)	Persons	15.46	17.41	19.65	20.75
Bangladesh			94.59	121.17	143.52	155.59
Sri Lanka	Total investment	Percent of GDP	27.61	26.33	25.33	31.05
Bangladesh			16.34	20.05	25.15	28.47
Sri Lanka	Gross national savings	Percent of GDP	18.13	20.68	22.29	25.63
Bangladesh			15.62	19.81	26.35	30.02
Sri Lanka	Inflation, average consumer prices	Percent change	13.62	9.72	11.06	6.23
Bangladesh			9.80	5.59	6.25	7.91

Source: World Economic Outlook, October 2014

A-2: Monetary Policy Stance: FY04-FY2016: Bangladesh

(In percent)

Particulars	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
CRR	4	4.5	5.	5	5	5	6	6	6	6
SLR (Inc. CRR)	16	16	18	18	18	18	19	19	19	19
Repo Rate	4.50	8.00	8.50	9.25	8.5	8.5-8.8	4.5-8.5	4.5-8.3	6.75-10.75	7.25-10.75
Reverse Repo Rate	2.50	4.50	6.04	6.50	6.5	6.5-6.8	2.5	2.5-3.5	4.5-7.5	5.25-5.75
91-Day T. Bill Rate	5.00	6.70	7.43	7.60	7.61-7.74	3.02-7.93	1.11-2.54	2.43-7	7.01-11.40	8.13-11.40
RM growth	8.01	12.53	28.12	22.83	20.6	31.9	18.1	21	15	9
M1 Growth	14.05	16.54	21.35	19.45	18.2	12	32.4	17.2	6.4	12.6
M2 Growth	13.84	16.81	19.51	18.33	17.6	19.2	22.4	21.4	17.4	16.7
Domestic Credit	7.70	17.50	20.45	16.24	21.8	15.9	17.6	28.4	19.2	10.9
Private Sector Credit	14.16	17.02	18.27	15.57	24.9	14.6	24.2	25.8	17.4	11.1

Source: The Central Banks of Bangladesh

A-3: Monetary Policy Stance: FY04-FY2014: Sri Lanka **(In percent)**

Particulars	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13
SRR/CRR	10	10	10	10	7.75	7	7	8	8	6
Reverse Repo Rate	9.00	10.25	11.50	12	12	9.75	9	8.5	9.5	8.5
Repo Rate	7.50	8.75	10.00	10.5	10.5	7.5	7.25	7	7.5	6.5
91-day T. Bill Rate	7.25	10.10	12.76	21.3	17.33	7.73	7.24	8.68	10	7.54
RM growth	20.64	15.71	21.20	10.24	11.51	13.08	18.77	21.91	10.21	10.21
M1 Growth	16.42	22.33	12.60	2.7	4.00	21.4	20.9	7.7	2.6	7.7
M2 Growth	19.57	19.06	20.70	15.6	11.7	19.9	18	20.9	18.3	18
Domestic Credit	21.98	15.35	29.50	16.34	18.02	0.54	18.61	34.25	21.66	13.65
Private Sector Credit	21.45	21.33	24.00	19.3	7	-5.8	24.9	34.5	17.6	7.5

Source: The Central Banks of Sri Lanka. Note: Unlike Bangladesh in Sri Lanka Repo and Reverse Repo imply absorption and injection of liquidity in the money market.

Table-4: Monetary Policy Framework in Sri Lanka and Bangladesh

Country	Establishment	Tools/Instruments	Objectives	Targeting
Sri Lanka	Establishment of the Central Bank in 1950 under the Monetary Law Act,(No. 58 of 1949)	Reserve requirements on commercial bank deposits, quantitative restrictions on credit, interest rate management, open market operations and the use of moral suasion.	The Central Bank has exercised multiple objectives such as stabilization of domestic monetary values, preservation of the stability of the exchange rate, promotion of a high level of production, employment and real income and encouragement and promotion of development of productive resources.	Sri Lanka practices monetary targeting framework and under this framework, the final target, price stability, is to be achieved by influencing the changes in broad money supply which are linked to reserve money (operating target) through a multiplier.
Bangladesh	Bangladesh Bank order, 1972	CRR and SLR Open Market Operations withdrawing or injecting liquidity Changes in policy interest rates (bank rate, repo, reverse repo rates).	Economic Growth Price Stability Exchange Rate Stability Deliberate directional bias in monetary and financial policies towards the financing of productivity and sustainability enhancing output initiatives.	Operating Targets Reserve Money Intermediate Targets Broad Money

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Decomposing Exchange Rate Movements into Real and Nominal Shock: Experience from Bangladesh, India, Sri Lanka and Pakistan

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Abstract:

This study attempts to decompose exchange rate movements of the US dollar against the domestic currency of Bangladesh, India, Sri Lanka, and Pakistan into real and nominal shocks. Structural vector autoregression (SVAR) model is employed to examine the dynamic effects of real and nominal shocks on exchange rate movements while assuming the long-run neutrality restriction of nominal shocks on real exchange rate. This empirical analysis demonstrates the effect of a real shock on the real and nominal exchange rates is of a persistent nature for all countries, resulting in a long-run real appreciation. On the other hand, the effect of a nominal shock on the nominal exchange rates demonstrates that nominal shock takes few months for decreasing response (depreciation) in the nominal exchange rates in all countries. In addition, real shock dominates nominal shock in both real and nominal exchange rates series for Bangladesh, India and Pakistan except Sri Lanka. The findings of the paper suggest that monetary and exchange rate policies should make an effort in offsetting the effect of real shock through sterilization of foreign reserve outflow or raise interest rate for the purpose of economic stabilization.

Keywords: Exchange Rates, Nominal Shocks, and Real Shocks
JEL classification: C32, F31.

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Introduction

The central bank of Bangladesh, India, Sri Lanka, and Pakistan have liberalized the exchange rates (Exchange rate, in this paper, refers to the price of one unit of national currency in terms of foreign currency— US dollar. Following this definition a decline in the exchange rate would represent a depreciation, and vice-versa.) to achieve the goals of a vibrant market mechanism through the interaction of demand for and supply of currencies. Under this regime the international capital mobility has intensified the level of dollarization which in turn induces instability of exchange rate. Dollarization may reduce a 'fear of floating' by partially reducing the adverse impact of exchange rates fluctuations on the economy at the aggregate level. Viaene and Vries (1992) argued that, for the developing countries, exchange volatility has an adverse effect on international trade. Many emerging countries, on the other hand, appeared to be reluctant to allow exchange rates to move freely due to a 'fear of floating' psychology— as argued by Calvo and Reinhart (2002). There are several causes behind the emergence of such fear, as- the lack of credibility associated with the high volatility in exchange rates, high pass-through from exchange rates to domestic prices, and the sizable foreign currency dominated debt (Ok, Kakinaka, and Miyanamoto 2010). Thus, exchange rates management has always been an important measure in mitigating external and internal imbalances as a nominal anchor in most of the developing countries, thus Bangladesh, India, Sri Lanka, and Pakistan are no exception.

The objective of this paper is to investigate the sources of movements in real and nominal exchange rates in Bangladesh, India, Sri Lanka, and Pakistan. We assume that any shock to either type of exchange rates is due to the real shocks, such as resource endowments, technological advancement, preferences; and nominal shocks, such as money supply. Lastrapes (1992) and Evans and Lothian (1993) among others interpret temporary shocks as nominal disturbances and permanent shocks as real disturbances. Ha, Lee and Cheong (2007) consider real shocks as fundamental disturbances, and nominal shocks as non-fundamental disturbances. In order to identify the real and nominal exchange rates movements by the dynamic effects of real and nominal shocks, this paper conducts a structural vector autoregression (SVAR) model with the long-run neutrality restriction that is nominal shocks have only a short-run effect but no long-run effect on real exchange rates. Lastrapes (1992), Enders and Lee (1997), Chowdhury (2004), and Ok et al. (2010) conducted similar empirical studies which were based on the technique developed by Blanchard and Quah (1989).

The recent trend in emerging economies is that the exchange rates regime has been shifting toward nominal exchange rates flexibility, although often managed due to the 'fear of floating' (Calvo and Reinhart 2002). Moreover, since the real exchange rates are typically considered as measures of international competitiveness, some emerging countries seem to pursue the exchange rates policies that try to set the real exchange rates at some target level through adjusting the nominal exchange rates (Silva 1999).

A number of studies incorporated structural VAR model with the long-run neutrality restriction of Blanchard and Quah (1989) in order to investigate sources of exchange rates movements by decomposing the exchange rates series into the real and nominal disturbances. Lastrapes (1992) for six developed countries (United States, Germany, United Kingdom, Japan, Italy and Canada) points out that real shocks dominate nominal shocks for both exchange rates series over short and long frequencies. Kim and Enders (1991) examine real and nominal causes of real exchange rates movements in the Pacific Rim nations and show some evidence of the long-run neutrality of nominal shocks. Clarida and Gali (1994) using data of four developed countries (Germany, Japan, Britain, and Canada) find that demand shocks, to national saving and investment, explain the majority of the variance in real exchange rates fluctuations; while supply shocks explain very little. Chen and Wu (1997) use the data for four Pacific Basin Countries (Japan, Korea, Taiwan and Philippines) and show that real shocks have a significant impact on the variability of real exchange rates and real shocks were more important during the 1990s than during the 1980s, especially for Japan, Taiwan, and Philippines. Enders and Lee (1997) show that nominal shocks have a minor effect on the real and nominal exchange rates for Canada, Germany, and Japan over the sample period of January 1973 to April 1992. The work of Dibooglu and Kutan (2001) using monthly data from January 1990 through March 1999, demonstrates that nominal shocks are a dominant source in determining the real exchange rates movement in Poland, while real shocks are dominant in Hungary. Wang (2004) employs structural decomposition technique in his study and finds that relative real demand and supply shocks account for most of the variation in real exchange rates changes and supply shocks are as important as nominal shocks in accounting for real exchange rates fluctuations for China using yearly data from 1980 to 2002. Chowdhury's (2004) analysis for six emerging countries (Chile, Colombia, Malaysia, Singapore, South Korea and Uruguay) also show that real shocks dominate nominal shocks for the exchange rates series over the sample period of January 1980 to December 1996. Ha et al. (2007) also find that exchange rates fluctuations are primarily a result of real shocks in Korea. Moreover, Ok et al (2010) point out that real shocks in the direction of depreciation lead to real and nominal depreciation, while nominal shocks induce long-run nominal depreciation but real appreciation in short-run for Cambodia and Lao PDR.

To best of our knowledge, there is no study on Bangladesh, India, Sri Lanka, and Pakistan that examines the sources of movements on real and nominal exchange rates using bivariate SVAR. This paper attempts to decompose real and nominal exchange rates fluctuations into real and nominal factors through applying a SVAR model with the long-run neutrality restriction in which nominal shocks have only a short-run effect but no long-run effect on real exchange rates.

Our empirical finding from the SVAR analysis demonstrates that the effect of a real shock on the real and nominal exchange rates is of a persistent nature for all countries, resulting in a long-run real appreciation (consistent with among others Lastrapes 1992; Enders and Lee 1997; Chowdhury 2004; Ha et al. 2007; Ok et al. 2010). On the other hand, the effect of a nominal shock on the nominal exchange rates demonstrates that nominal shock takes few months for decreasing response (depreciation) in the nominal exchange rates in all countries. This result is consistent with the argument of Dornbusch (1976) that raise in nominal money supply leads a proportionate rise (depreciation) in nominal exchange rates in the long-run. In addition, real shock dominates nominal shock in both real and nominal exchange rates series for Bangladesh, India, and Pakistan except Sri Lanka. Real shock dominates nominal shock in real exchange rates and nominal shock dominates real shock in nominal exchange rates for Sri Lanka.

The remaining of this paper consists of a section containing empirical analysis of exchange rates movements through decomposing the fluctuations of exchange rates into nominal and real components for Bangladesh, India, Sri Lanka, and Pakistan; and the last section provides the conclusion along with several policy recommendations.

Empirical Analysis

Model Specification

In order to specify our model, it has been assumed that observed real and nominal exchange rates are subject to two types of orthogonal shocks. The first shock is a "real shock," which mainly comes from the fundamental disturbances related to various structural macroeconomic conditions including resource endowments, technological advancement, productivity, and preference. The terms of trade and international competitiveness are generally affected by the real shocks (Lastrapes 1992; Enders and Lee 1997; Chowdhury 2004). The second shock is the nominal shock, which are mainly due to non-fundamental disturbances, such as nominal money supply shocks and the exchange rates depreciation or appreciation.

To provide some important perceptions on the sources of real and nominal exchange rates movements, we apply a bivariate SVAR analysis of real and nominal exchange rates through decomposing the variables into real and nominal shocks. Although the two shocks, real and nominal shocks, are not directly observable, they could be inferred from the examination of their joint behavior by imposing the long-run neutrality restriction that a nominal shock has no long-run or permanent impact on real exchange rates under certain assumptions (Enders and Lee 1997; Wang 2004). This restriction could be appropriate since the real exchange rates, as a relative price between domestic and foreign prices, is consistent with conventional economic models of exchange rates movements (Lastrapes 1992).

The long-run neutrality restriction on SVAR models is applied for various issues, such as the identification of fundamental economic shocks (Blanchard and Quah 1989; Shapiro and Watson 1988; King, Plosser, Stock, and Watson 1991; Lastrapes 1992; Clarida and Gali 1994; Wang 2004; Chen and Wu 1997; Chowdhury 2004; Enders and Lee 1997; Ok et al. 2010). This paper does not statistically test the neutrality restriction in the SVAR model. However, the restriction is simply required to make the structural disturbances just-identified and to examine the dynamic behaviors of these shocks on real and nominal exchange rates.

In order to identify the sequence of real and nominal shocks to exchange rates, we consider the infinite moving average representation in the structural shocks, following Lastrapes 1992; Enders and Lee 1997; Ok et al. 2010 among others, as follows:

$$\begin{bmatrix} \Delta r_t \\ \Delta n_t \end{bmatrix} = \begin{bmatrix} B_{11}(L) & B_{12}(L) \\ B_{21}(L) & B_{22}(L) \end{bmatrix} \begin{bmatrix} e_{rt} \\ e_{nt} \end{bmatrix} \qquad (1)$$

where r_t and n_t are the natural log of real and nominal exchange rates in period t, respectively; e_{rt} the real shock in period t; e_{nt} the nominal shock in period t; Δ the first difference operator; $B_{ij}(L)$ a polynomial in the lag operator L. By construction, we assume that the innovations are normalized withvar(e_t) = I, that real and nominal exchange rates are non-stationary and non-cointegrated, and that the first-differences of real and nominal exchange rates are stationary.

To impose the long-run neutrality restriction that nominal shocks have only a short-run effect but no long-run effect on real exchange rates, we consider the restriction that the sum of the coefficients in $B_{12}(L)$ is equal to zero, that is:

$$\sum_{k=0}^{\infty} b_{12}(k) = 0 \qquad (2)$$

Where $b_{12}(k)$ is the k-th coefficient in $B_{12}(L)$ and represents the effect of the nominal shocks, e_{nt}, on the first-difference of the real exchange rates, Δr_t, after k periods. Thus, the restriction (2) simply implies that the cumulative effect of e_{nt} on Δr_t is zero, i.e., nominal shocks have no long-run effects on real exchange rates.

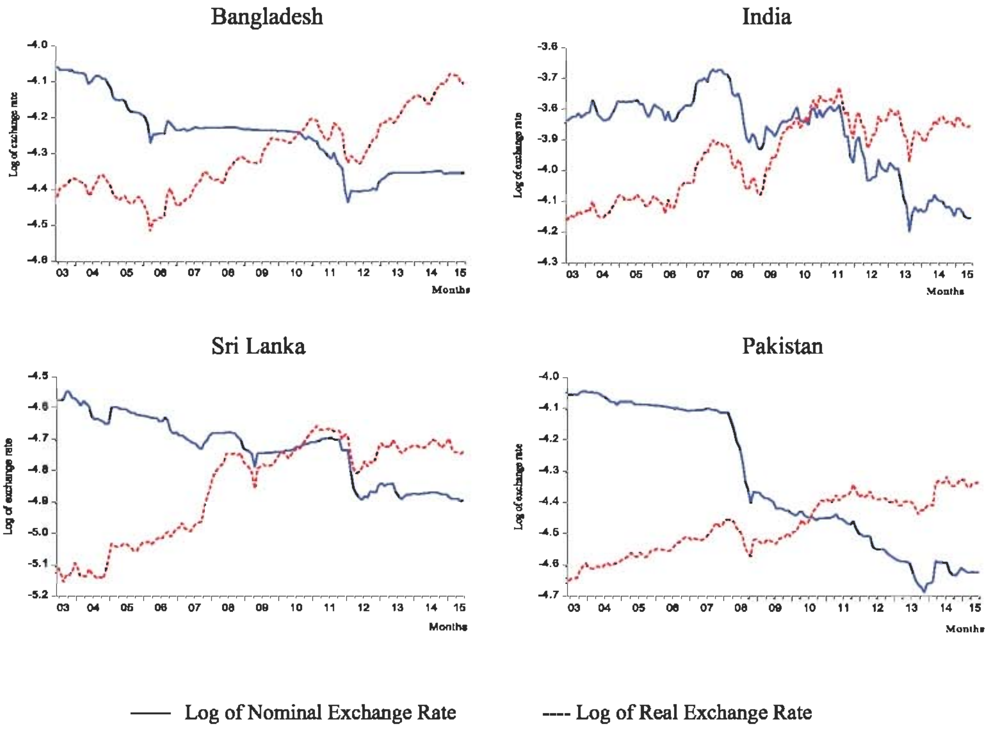
Some literature treats real and nominal shocks in a different, but related way under the assumption of the long-run money neutrality. For example, Chowdhury (2004) interprets the two types of shocks as permanent and temporary disturbances. The main feature of the permanent shock is that its effect on the time series lasts forever and thus never dies out, while the effect of temporary shock is of a transitory nature and dies out over time. Moreover, Ha et al. (2007) call the two types of shocks as fundamental and non-fundamental disturbances. The fundamental shock originates from structural macroeconomic conditions, resulting in permanent changes in real and nominal exchange rates. In contrast, the non-fundamental shocks come from monetary, non-fundamental factors, and have a permanent effect on nominal exchange rates but only a temporary effect on real exchange rates due to the long-run money neutrality.

Questions may arise as to whether this type of model is applicable to a developing economy such as Bangladesh, India, Sri Lanka, and Pakistan. For example, the model assumes an open economy with a flexible exchange rates and capital mobility, and full employment in the long run. Bangladesh, India, Sri Lanka, and Pakistan may not fully satisfy these assumptions. Fundamental changes in the economy over the past two decades have made the model increasingly more relevant to Bangladesh, India, Sri Lanka, and Pakistan. These countries have opened up their trade and become more market oriented. Moreover, Chen and Wu (1997) mention some potential problems related to the interpretation of the two structural shocks as real and nominal shocks. First, nominal shocks could have permanent impacts on real exchange rates, as emphasized in the work of Baldwin (1998). Although we admit this issue, the SVAR model with the long-run neutrality restriction would be appropriate for our primary purpose, as long as this impact is relatively small compared to that of real shocks, as shown in Blanchard and Quah (1989). Second, in reality exchange rates are subject to various types of shocks, so that the model with only two structural shocks may be inappropriate. However, since it is difficult to identify and test multiple shocks, the discussion under the assumption of the two structural shocks would be helpful to access the sources of exchange rates movements as an approximate methodology.

Data and Preliminary Results

The data are taken from International Financial Statistics (IFS) of the International Monetary Fund's (IMF). In order to carry out the empirical analysis of Bangladesh, India, Sri Lanka, and Pakistan we use the monthly observations on bilateral exchange rates from June 2003, since the flexible exchange rate regime of Bangladesh started from 31 May, 2003, to June 2015. Nominal exchange rates series considered is end-of-period rates and is expressed as US dollar per national currency units. The real exchange rate is derived by adjusting the nominal exchange rates with the ratio of the domestic price level to US price level. Consumer price index is used as a measure of price level in all countries. The log-level real exchange rates series r_t is generally constructed as $r_t = n_t - p_t^* + p_t$, where nt is the log of the nominal exchange rates considered from end-of-period rates, p_t and p_t^* are the log of the domestic price level and the log of US price level, respectively. Thus, the real exchange rates measure the relative price of domestic goods in terms of US goods.

An overview of the movements of nominal and real exchange rates for the sample countries from June, 2003 through June, 2015 has been furnished in Figure 1.


Bangladesh

India

Sri Lanka

Pakistan

Figure 1. Movements of nominal and real exchange rate

Estimation

In order to conduct the basic estimation of the SVAR model, there are several preliminaries needed to do. The first preliminary exercise is to investigate the presence of a unit root in the univariate representations of the real and nominal exchange rates. Augmented Dickey-Fuller (1979) and Phillips-Perron (1988) tests are carried out for all exchange rates series in log level and first difference for Bangladesh, India, Sri Lanka, and Pakistan. For all real and nominal log-level exchange rates the null hypothesis of the series having a unit root could not be rejected, which implies that the log-level of real and nominal exchange rates are non-stationary. On the other hand, the first-differences of real and nominal exchange rates are stationary in both tests for Bangladesh, India, Sri Lanka, and Pakistan (see Table 1). Since the real exchange rates series are non-stationary in all countries, it implies that purchasing power parity (PPP) appears to be violated in the long-run for Bangladesh, India, Sri Lanka, and Pakistan within the given sample period. This result could be consistent with the argument that the long-run PPP does not hold for most emerging economics, although it is controversial whether the long-run PPP holds for developed economics (Gan 1994; Taylor 1995; Calvo and Reinhart 2002; Chowdhury 2004; Ok et al. 2010).

Table 1. Stationary Test

		Level		First-Difference	
Country	Variable	ADF Test	PP Test	ADF Test	PP Test
Bangladesh	n	-1.83	-1.80	-10.52*	-10.52*
	r	-0.53	-0.40	-8.39*	-7.97*
India	n	-0.23	-0.37	-10.73*	-10.70*
	r	-1.66	-1.67	-11.77*	-11.77*
Sri Lanka	n	-0.88	-0.89	-9.61*	-9.75*
	r	-1.64	-1.43	-9.65*	-9.64*
Pakistan	n	-0.63	-0.46	-5.69*	-8.91*
	r	-1.27	-1.27	-10.87*	-10.84*

*Note: n is the logarithm of the nominal exchange rate, and r is the logarithm of the real exchange rate. The lag length was selected basing on Schwarz's Bayesian Information Criterion. * represents statistical significance at 1 percent.*

Given the non-stationary results, we now test the long-run relationship between real and nominal exchange rates through examining whether the two non-stationary series are cointegrated for Bangladesh, India, Sri Lanka, and Pakistan. The result of Johansen cointegration test (1992) suggests that real and nominal exchange rates are not cointegrated for Bangladesh, India, Sri Lanka, and Pakistan. It implies that no long-run equilibrium between nominal and real exchange rates in Bangladesh, India, Sri Lanka, and Pakistan over the considering period (see Table 2).

Table 2. Johansen-Juselius cointegration Tests

	λ_{trace} test					λ_{max} test				
Country			λ_{trace}	Prob	CE			λ_{max}	Prob	CE
Bangladesh	$H_0: r=0^*$	$H_A: r>0$	5.54	0.7493	0	$H_0: r=0^*$	$H_A: r=1$	5.33	0.7001	0
	$H_0: r\leq 1$	$H_A: r>1$	0.21	0.6464	0	$H_0: r=1$	$H_A: r=2$	0.21	0.6464	0
India	$H_0: r=0^*$	$H_A: r>0$	5.87	0.7113	0	$H_0: r=0^*$	$H_A: r=1$	5.55	0.6717	0
	$H_0: r\leq 1$	$H_A: r>1$	0.32	0.5726	0	$H_0: r=1$	$H_A: r=2$	0.32	0.5726	0
Sri Lanka	$H_0: r=0^*$	$H_A: r>0$	10.52	0.2429	0	$H_0: r=0^*$	$H_A: r=1$	7.43	0.4395	0
	$H_0: r\leq 1$	$H_A: r>1$	3.09	0.0789	0	$H_0: r=1$	$H_A: r=2$	3.09	0.0789	0
Pakistan	$H_0: r=0^*$	$H_A: r>0$	10.30	0.2584	0	$H_0: r=0^*$	$H_A: r=1$	9.68	0.2341	0
	$H_0: r\leq 1$	$H_A: r>1$	0.62	0.4294	0	$H_0: r=1$	$H_A: r=2$	0.62	0.4294	0

*Note: The λtrace and λmax are calculated as per Johansen (1988) and Johansen and Juselius (1990). p-values are calculated as per MacKinnon et al. (1999). r stands for the rank of the matrix, which denotes the number of the conintegrating equation between the variables. CE stands for conintegrating equation. *Denotes rejection of the hypothesis at the 0.05 level.*

Given that real and nominal exchange rates are non-stationary at the level but stationary at the first-difference, and that they are not cointegrated, the SVAR specification can be appropriate to examine the dynamic effects of real and nominal shocks on real and nominal exchange rates in all countries. Since our observations are monthly, we select maximum lag 13 in Bangladesh, lag 12 in India, lag 10 in Sri Lanka, and lag 14 in Pakistan for SVAR specification.

Impulse Response Functions

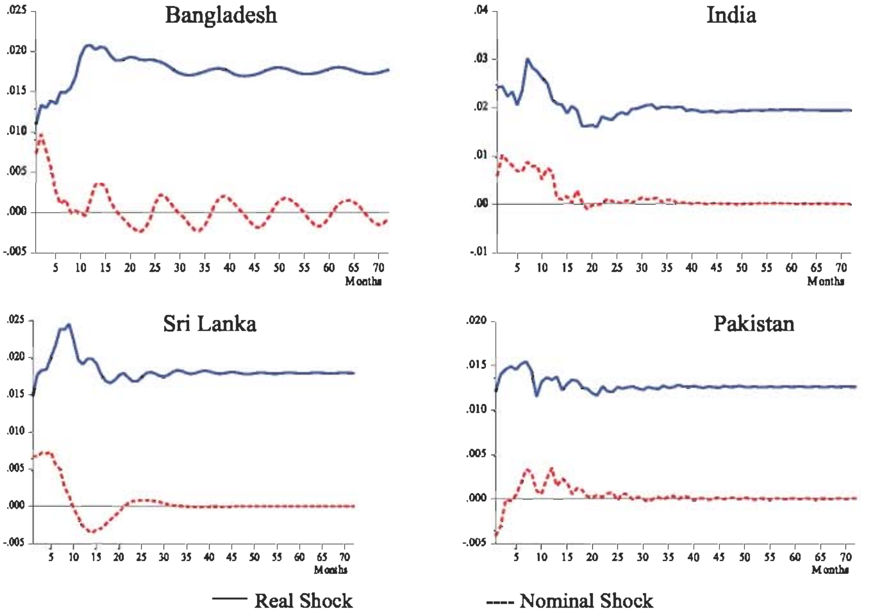


Figure 2. Accumulated response of first difference real exchange rate to structural one S.D. innovations

In order to investigate the effect of each type of shocks on real and nominal exchange rates, this paper estimates the SVAR model and derives impulse response functions (IRFs) for Bangladesh, India, Sri Lanka, and Pakistan. The Figure 2 represents the dynamic response of real exchange rates to one standard deviation of real and nominal shocks over a horizon up to 72 months for all countries. Each panel in Figure 2 is shown in terms of cumulative sums of the difference dynamics.

The Figure 2 shows that one standard deviation of real shock induces an immediate accumulated positive response in the real exchange rates of all countries. This effect increases up to 12 months for Bangladesh, 7 months for India, 9 months for Sri Lanka, 4 months for Pakistan, after that the accumulated response of real exchange rates gradually declines and stabilizes in the long horizon for those countries. Thus, the effect of a real shock on the real exchange rates is of a persistent nature, resulting in a long-run real appreciation for Bangladesh, India, Sri Lanka, and Pakistan. Similar findings were derived by Lastrapes (1992), Enders and Lee (1997), Chowdhury (2004), Ha et al. (2007), and Ok et al. (2010).

On the other hand, one standard deviation of nominal shock in the Figure 2 persuades an immediate accumulated positive response in the real exchange rates for Bangladesh, India and Sri Lanka, but influences an immediate accumulated negative response in the real exchange rates for Pakistan. This response peaks at 2 months, 2 months, 5 months, 12 months horizon and die out at 8 months, 16 months, 10 months, 28 months horizon for Bangladesh, India, Sri Lanka, and Pakistan respectively. It clearly reflects the identification restriction; the nominal shock has no effect on real exchange rates in the long-run. However, it does appear to be a non-trivial impact in the short-run.

The Figure 3 shows the dynamic response of nominal exchange rates to one standard deviation of real and nominal shocks over a horizon up to 72 months for all countries. Each panel in Figure 3 is shown in terms of cumulative sums of the difference dynamics. Figure 3 illustrates that one standard deviation of real shock tempts an instantaneous accumulated positive response in the nominal exchange rates for all countries. This effect peaks at 11 months, 7 months, 7 months, 6 months, after that the response of nominal exchange rates gradually declines and stabilizes in the long horizon for Bangladesh, India, Sri Lanka, and Pakistan respectively. Thus, the effect of a real shock on the nominal exchange rates is of a persistent nature, resulting in a long-run nominal appreciation [similar findings were derived by Lastrapes (1992), Enders and Lee (1997), Chowdhury (2004), Ha et al. (2007), and Ok et al. (2010)]. The dynamic response of the nominal exchange rates to a real shock is very similar to that of the real exchange rates in all countries. This suggests that permanent changes in the real exchange rates due to real shocks mainly occur through nominal exchange rates changes.

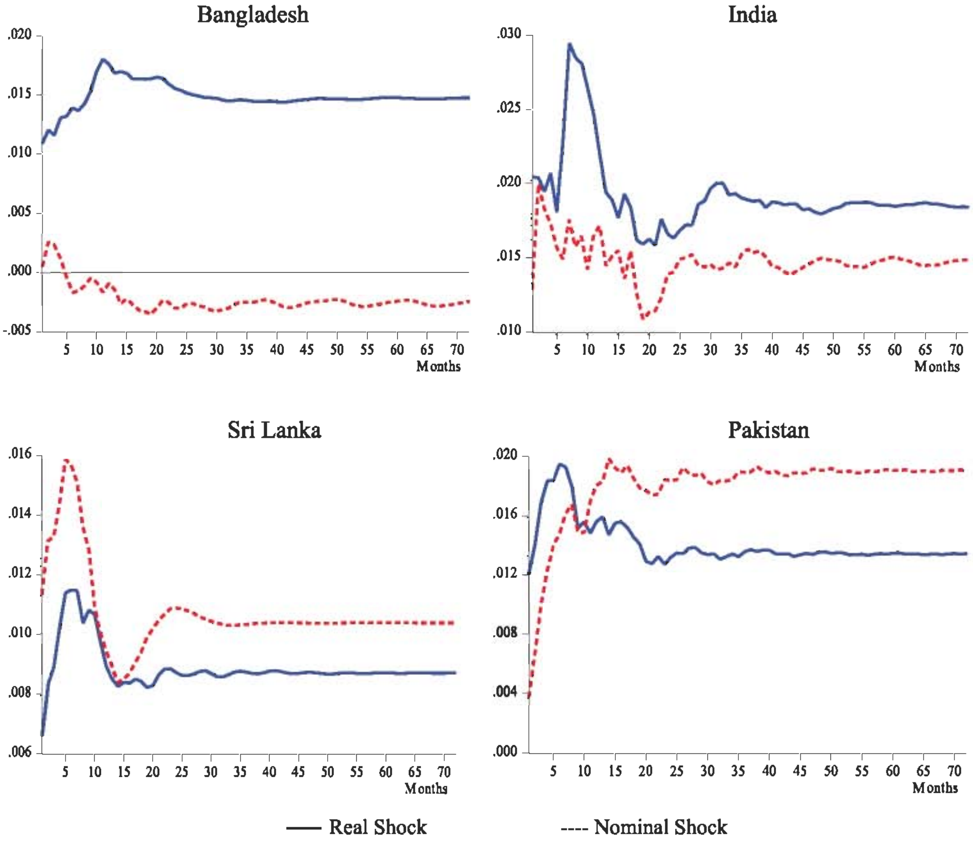


Figure 3. Accumulated response of first difference nominal exchange rate to structural one S.D. innovations.

On the other hand, one standard deviation of nominal shock persuades an immediate accumulated positive response in the nominal exchange rates in all countries (Figure 3). This response peaks at 2 months in Bangladesh and India, 5 months in Sri Lanka, and 14 months in Pakistan. After that it has decreasing response in the nominal exchange rates for all countries. This result is consistent with the argument of Dornbusch (1976) that raise the idea that nominal money supply leads a proportionate rise (depreciation) in nominal exchange rates in the long-run.

If technology shock is considered as one type of real shock, which is of particular interest to the economy of Bangladesh, India, Sri Lanka, and Pakistan, the impact of a real shock on real exchange rates can be discussed in the framework of Harrod-Balassa-Samuelson (Harrod 1933; Balassa 1964; Samuelson 1964) argument— that the real exchange rates movements in the long-run could be explained by the productivity growth in tradable sectors. Higher productivity growth in tradable sectors tends to increase local input costs and therefore prices of non-tradable sectors (Berka, Devereux, and Engel 2012). Since traded-goods prices tend to be equalized across countries, this raises the local price level, which is a real exchange rate appreciation (Berka et al. 2012). Thus, a positive technology shock should induce real appreciation of the home currency. This Harrod-Balassa-Samuelson effect has been found consistent with the case of all countries. In addition, accelerated structural reforms and market liberalization, as observed in many emerging market economies since the late 1980s, are found to have led to a significant Harrod-Balassa-Samuelson effect (Ito, Isard and Symansky 1999; Agenor 1998; Chinn 2000).

Variance Decompositions

In order to summarize the information contained in the moving average representation, the variance decompositions (VDCs) are conducted in this paper and in which the exchange rates series can be decomposed into real and nominal shocks. The VDC measures the average, relative contribution to forecast error variance of each shock in terms of forecast horizon. On the other hand, impulse response function reveals the dynamic effect of a one-time shock. The VDC is a convenient measure of the relative importance of such shock into the system. The summarized results of the VDC for the first-difference of log real and nominal exchange rates for the periods up to 72 months are shown in Table 3. Table 3 contains only the relative contribution of forecasted error variance in percent of the real shocks; the remaining variance is attributed to the nominal shocks for all countries.

The relative contribution of a real shock in explaining the variation of real exchange rates is 68.88, 94.51, 83.03, 89.63 percent at the horizon of one month; 64.87, 91.43, 83.48, 84.73 percent at the horizon of four month; 61.03, 91.43, 81.50, 82.70 percent at eight month; 61.70, 89.92, 80.44, 80.08 percent at twelve month and reaches at 53.75, 84.49, 80.17, 76.81 percent at an increased forecasting horizon of 72 months for Bangladesh, India, Sri Lanka, and Pakistan respectively. On the other hand, the relative contribution of a real shock explains about 99.78, 71.53, 25.26, 91.15 percent of the variation of nominal exchange rates at the horizon of one month; 95.57, 65.59, 26.75, 80.25 percent at four month; 92.42, 67.83, 27.07, 78.34 percent at eight month; 91.47, 67.42, 26.97, 76.06 percent at twelve month and reaches at 89.04, 65.60, 26.99, 74.24 percent an increase in forecasting horizon of 72 month for Bangladesh, India, Sri Lanka, and Pakistan respectively. It has clear evidence that real shock dominates nominal shock in both real exchange rates and nominal exchange rates for Bangladesh, India, and Pakistan except Sri Lanka. Real shock

Table 3. Variance Decompositions of Real and Nominal Exchange Rates

	Relative Contribution of Real Shock to							
Forecast Horizon	Bangladesh		India		Sri Lanka		Pakistan	
	Δr	Δn	Δr	Δn	Δr	Δn	Δr	Δn
1-month	68.88	99.78	94.51	71.53	83.03	25.26	89.63	91.15
4-month	64.87	95.57	91.43	65.59	83.48	26.75	84.73	80.25
8-month	61.03	92.42	91.43	67.83	81.50	27.07	82.70	78.34
12-month	61.70	91.47	89.92	67.42	80.44	26.97	80.08	76.06
24-month	58.94	89.56	84.74	65.70	80.11	26.97	77.62	74.85
36-month	56.77	89.31	84.56	65.67	80.16	26.99	77.00	74.40
48-month	55.43	89.19	84.51	65.61	80.17	26.99	76.86	74.28
60-month	54.47	89.10	84.50	65.60	80.17	26.99	76.82	74.25
72-month	53.75	89.04	84.49	65.60	80.17	26.99	76.81	74.24

Note: Δr is the first difference of logarithm of the real exchange rate, and Δn is the first difference of logarithm of the nominal exchange rate. Contribution of a nominal shock is 100 minus the contribution of a real shock.

dominates nominal shock in real exchange rate and nominal shock dominates real shock in nominal exchange rates for Sri Lanka. Moreover, the relative contribution of a real shock in explaining the variation of nominal exchange rates is greater than that of real exchange rates, it might be the case that real disturbances quickly capture most of the nominal exchange rates fluctuation in Bangladesh (this finding is consistence with the work of Lastrapes 1992 for Japan).

In sum, real shock plays more important roles in explaining the variation of real and nominal exchange rates for Bangladesh, India, and Pakistan except Sri Lanka. Real shock plays more important roles in explaining the variation of real exchange rates and nominal shock plays more important roles in explaining the variation of nominal exchange rates for Sri Lanka. This result would be consistent with the high importance of real shock in most developed and emerging countries (Lastrapes 1992; Enders and Lee 1997; Chowdhury 2004), but is in contrast to the high importance of nominal shock for Korea (Ha et al. 2007).

Conclusions

The sources of exchange rates movements of real and nominal exchange rates in Bangladesh, India, Sri Lanka, and Pakistan are investigated in this paper by conducting a structural VAR model over the sample period June 2003 to June 2015. It has been mentioned earlier that our paper assumes two structural shocks: real shock and nominal shock. Furthermore, we assume nominal shock has no long-run effect on real exchange rates. Based on these assumptions, we find that the effect of a real shock on the real and nominal exchange rates is of a persistent nature for all countries, resulting in a long-run real appreciation (consistent with among others Lastrapes 1992; Enders and Lee 1997; Chowdhury 2004; Ha et al. 2007; Ok et al. 2010). On the other hand, the effect of a nominal shock on the nominal exchange rates demonstrates that nominal shock takes few months for decreasing response (depreciation) in the nominal exchange rates in all countries. This result is consistent with the argument of Dornbusch (1976) that raise in nominal money supply leads a proportionate rise (depreciation) in nominal exchange rates in the long-run. In addition, real shock dominates nominal shock in both real and nominal exchange rates series for Bangladesh, India, and Pakistan except Sri Lanka. Real shock dominates nominal shock in real exchange rates and nominal shock dominates real shock in nominal exchange rates for Sri Lanka. Moreover, the relative contribution of a real shock in explaining the variation of nominal exchange rates is greater than that of real exchange rates; it might be the case that real disturbances quickly capture most of the nominal exchange rates fluctuation in Bangladesh.

A significant impact of real shock on exchange rates could provide some implications from a policy point of view. The objective of monetary and exchange rate policies should be to make an effort in offsetting the effect of real shock through sterilization of foreign reserve outflow or raise interest rate for the purpose of economic stabilization in all countries.

The model specification illustrated in this paper might be too simple since decomposition of the shock in only two types, nominal and real, might arise difficulties to capture any possible shock. In practice, existing managed floating exchange rate policy is complicated because of the fact that policy makers cannot easily distinguish between the observed real and nominal shock. Although we have addressed these issues in our paper, we belief that the findings of this paper highlight some important policy implications of the exchange rates movement in Bangladesh, India, Sri Lanka, and Pakistan; and we hope that more in-depth research would be conducted in this area in the near future.

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Relationship between Remittances and Food Prices in Bangladesh

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Abstract

Workers' remittance inflows have been rising significantly over the past decade for Bangladesh. Remittances contributing over 10% of GDP of Bangladesh have become one of the most stable sources of foreign exchange earnings and emerged as a crucial issue for monetary and fiscal policy. Besides lowering poverty and stimulating economic growth through different microeconomic and macroeconomics channels, remittances like other massive capital inflows can induce inflation by causing a rise in prices of food and non-food items as well as consumer durables. In this paper, we have empirically tested whether growing remittances cause an increase in food inflation in Bangladesh using monthly data over the time period July 2003- July 2013 (post-floating exchange rate scenario). Monthly data is used to better represent the changes in food inflation which is quickly responsive to shocks. The reason for specifically concentrating on the post-floating exchange rate scenario comes from the fact that the impact of remittances on a economy depends on the exchange rate regimes and studies not controlling for regimes may be biased as suggested by Ball et al. (2013). Johansen (1988) and Johansen & Juselius (1990) cointegration technique is used to determine the long run relationship between remittances and food inflation. Then, a Vector Error Correction Model (VECM) approach is applied for estimating the direction, extent and significance of the relationship and short run adjustment of disequilibrium in the long run. The results show that remittance inflows cause an inflationary pressure for food items in Bangladesh.

Keywords: Remittances, Inflation, Cointegration, VECM
JEL Classification: E31, F24

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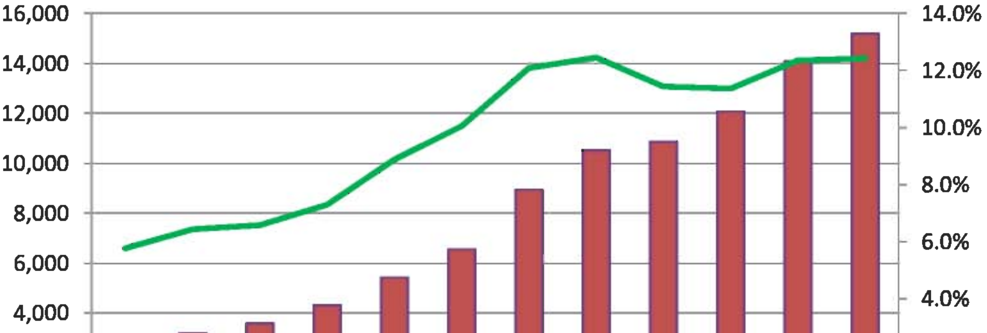
Introduction

Inflows of workers' remittances to Bangladesh have experienced a sharp rise in recent years. Remittances have also evolved as a more stable and important source of foreign exchange earnings compared to official development assistance, foreign direct investment or other types of capital flows. Remittances have some comparative advantages as they do not create future repayment obligation like capital flows and the recipient countries do not need to comply with certain political and economic conditions like foreign aid. Moreover, foreign aids come to the government and work as public aid while remittances come to the households and work as private aid. The spending nature of the government is largely different from that of individual households as government spends a significant portion on development projects whereas households spend more on consumption purposes thus inducing consumer price index (CPI). While some studies conclude that a high inflow of remittances lower poverty and stimulates economic growth (e.g. Acosta et al., 2009; Giuliano & Ruiz-Arranz, 2009), some studies suggest that remittances can induce inflation in the recipient economies (e.g. Balderas & Nath, 2008; Narayan et al., 2011; Nisar & Tufail, 2013; Khan & Islam, 2013).

Figure 1: Remittance Inflows and Share of Remittances to GDP



Source: Compiled by authors from Migration and Remittances data and World Development Indicators (WDI) Database of World Bank (2013, 2014) & various issues of Monthly Economic Trends of Bangladesh Bank (2014a)

Workers' remittances have grown significantly compared to other more traditional sources of foreign exchange like aid and exports for Bangladesh. Given the growing share of remittances in GDP and foreign exchange earnings, it is important to identify the economic impacts of remittances. According to Bangladesh Bureau of Statistics (2013) the part of the remittance being spent is more or less equally spent on food and non-food items, each accounting for about 39% of the total while 5% on consumer durables. In this paper, we have attempted to examine whether workers' remittances induces food inflation in Bangladesh particularly after adopting the floating exchange rate regime in 2003. The reason for specifically concentrating on the post-floating exchange rate scenario comes from the fact that the impact of remittances on a economy depends on the exchange rate regimes and studies not controlling for regimes may be biased as suggested by Ball et al. (2013). Reinhart and Rogoff (2004) show that, an increase in remittance inflows causes a transfer of resources from the tradable to the non-tradable sector which generates a rise in the price level. Under a fixed exchange rate regime, international relative prices cannot be adjusted after a negative shock to the tradable sector. Thus the nominal depreciation is prevented. The resulting effect will be a contracting tradable output sector and a rising price level. On the other hand, remittance inflows can increase the price level and appreciate the exchange rate as the international relative prices can be adjusted under a flexible exchange rate regime.

This paper will help to understand the various impacts of remittances on Bangladesh economy and assist in the development of policies maximizing benefits of these income inflows. The paper is organized in the following way. It starts with discussing the literature review which captures the relevant theories, empirical studies and their results concerning impact of remittances on price level. The next section specifies the models by discussing the determinants of food inflation. Data issues, econometric methodology, empirical results and some limitations are presented following. The final section includes the conclusions and policy implications.

Literature Review

Keynes (1929) and Ohlin (1929) were the first who debated on having significant effects of transfers on receiving economies what has been dubbed as the Transfer Problem. The debate which extends to the present time suggests that the theoretical welfare impacts of capital inflows are ambiguous and largely depends on the various characteristics of the sending and receiving countries (Djajic, 1998).

Literature on the effects of remittance inflows mostly focuses on the exchange rate or Dutch Disease issues (e.g. Amuedo-Dorantes & Pozo, 2004; Bourdet & Falck, 2006; Lartey et al., 2012) and terms of trade issues. Adelman and Taylor (1992) pointed out that, workers' remittance inflows may also have effects on inflation through their direct and indirect effects on aggregate demand. Remittances are spent partly on consumption and partly on investment. The direct effect of remittances on aggregate demand is resulted by the increase in consumption expenditure of the receiving households which in turn creates an inflationary pressure.

Existing empirical works in the area of the relationship between remittances and inflation have been undertaken by using time series models (single country level) and panel data models (cross-country level). However, the findings of most of the studies are compatible with the existence of inflationary pressure caused by remittance inflows.

The majorities of the single country studies are undertaken by using cointegrating equations and vector autoregressive models and come to somewhat similar conclusions. Using generalized impulse responses derived from a vector autoregression (VAR) model, Ulyses Balderas & Nath (2008) examined the effects of remittances on inflation and the distribution of relative price changes in Mexico for the period 1980 to 2005. While they found little evidence of any significant impact of remittances on inflation and relative price variability for the entire sample period, remittances seemed to have significant positive effects after 1994.

Kim & Yang (2008) explored why an increase in capital inflows can increase asset price by using output, price level, capital inflows or portfolio inflows (as a ratio to trend GDP) stock price and land price. By using a VAR model, they found that the capital inflows have actually contributed to the asset price appreciation in the emerging East Asian economies although the capital inflow shocks explain a relatively small part of asset price fluctuations.

Rashid & Husain (2010) examined the effects of capital inflows on domestic price level, monetary expansion and exchange rate volatility in Pakistan for the period 2001-2007. By using linear and nonlinear cointegration and Granger causality tests, they found that there exists a significant inflationary impact of capital inflows. Mukhtar (2012) reexamined Romer's Hypothesis for Pakistan over the period from 1960 to 2007. By using cointegration analysis, he confirmed the existence of Romer's hypothesis[1] in Pakistan. Nazir et al. (2012) checked the impact of capital inflows on Pakistan's domestic inflation from 1980-2010. Using cointegration test and Error Correction Mechanism (ECM), they found that there is a long run and significant relationship among foreign direct investment (FDI), remittances, export and inflation. Nisar & Tufail (2013) examined the impact of remittances on inflation, food inflation, footwear & textile inflation and housing & construction inflation for Pakistan by using Johansen (1988) and Johansen & Juselius (1990) cointegration technique over the time period 1970-2010. They found that remittances have positive impact on inflation and its different categories.

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[1] Romer (1993) postulates a hypothesis that inflation is lower in small and open economies.

Khan & Islam (2013) verified how remittances inflows affect the inflation rate in Bangladesh for the 1972-2010 time period by applying vector autoregressive (VAR) techniques. Their empirical results conclude that a 1 percent increase in remittance inflows lead to a rise in inflation by 2.48 percent in the long run, whereas no significant relationship is evident between these two variables in the short-run.

The panel studies in this area have used Keynesian type econometric model, generalized method of moments (GMM) and Arellano & Bond (1991) panel dynamic estimator, Arellano & Bover (1995), Blunddell & Bond (1998) system GMM estimator. GMM and instrumental variable approach are used to deal with the potential endogeneity problem in the models.

Glytsos (2002) builds a Keynesian type econometric model for investigating the short and long-run multiplier effects of remittances on consumption, investment, imports and output using data of five Mediterranean countries. Glytsos (2002) reveals that "a uniform country performance of instability and uncertainty, with great temporal and inter-country fluctuations of remittance effects. The findings point to different inter-country priorities of remittance spending and to an asymmetric impact of remittance changes, in the sense that the good done to growth by rising remittances is not as great as the bad done by falling remittances."

Narayan et al. (2011) modeled the impact of remittances and institutional variables on inflation in both short run and long run using a panel data set of 54 developing countries over the period 1995-2004. Using Arellano & Bond (1991) panel dynamic estimator, Arellano & Bover (1995), Blunddell & Bond (1998) system GMM estimator, they found that remittances generate inflation in developing countries and the effect is more pronounced in the long run.

Given the above discussions on the literature, it seems that there is a space of more research to determine the influence of remittances on inflation of Bangladesh in a scenario of steady remittance growth and floating exchange rate regime. Moreover, almost all the past studies are based on yearly data. In this paper, we have used monthly data which can better represent the inflation as it changes on a frequent basis.

Data

In our research, we want to specifically test the hypothesis that remittances result in an increase in food prices in Bangladesh. To do that, we need to control for other explanatory variables which could also influence food prices. There is an extensive literature on the determinants of food prices (see, surveys by Bronfenbrenner &

Holzman (1963); Laidler & Parkin (1975); Berk (1999) and papers by Cotarelli (1998); Galí et al. (2001); Ulyses Balderas & Nath (2008); Ball et al. (2013); Khan & Islam (2013)). In empirical analyses, there are also different choices of determinants. Sometimes the set of determinants are chosen relying on the availability of data. Besides remittances, the following additional determinants are thought to influence food prices:

$$q = f(\underset{+}{GOV},\ \underset{-}{IPI},\ \underset{+}{M2},\ \underset{+}{ER},\ \underset{+}{REM})$$

where q represents Food Inflation; Government Expenditure (GOV), Industrial Production Index (IPI), Money Supply (M2), Exchange Rate (ER) and Remittances (REM) are the determinants of q. The sign beneath each variable show the expected direction of food inflation in response to that variable.

The study employs monthly data for food consumer price index (CPI), industrial production index, remittance inflows, money supply, exchange rate as well as monthly government expenditure data interpolated from yearly data series. Logarithm of Food CPI is used as a proxy of food inflation. In this regard, we have followed Nisar & Tufail (2013) and Khan & Islam (2013) who used yearly CPI data to represent inflation in their studies. Food CPI series come from various Monthly Economic Trends and Major Economic Indicators of Bangladesh Bank.

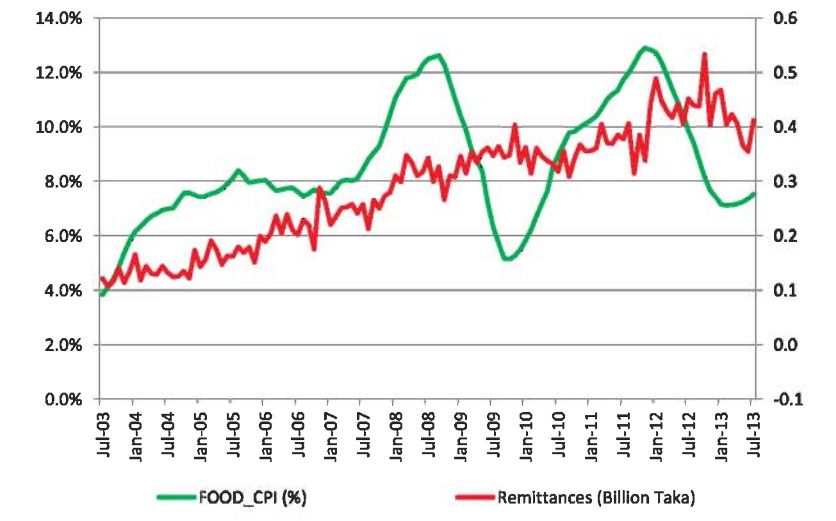

Figure 2: Food Inflation (FOOD_CPI) & Remittances (REM)

Source: Compiled by authors from various issues of Monthly Economic Trends and Major Economic Indicators of Bangladesh Bank (2014a, 2014b)

Industrial Production Index (IPI) is used as a measure of output. Nisar & Tufail (2013) and Khan & Islam (2013) used per capita GDP as they used yearly data. However, as we are using monthly data, it becomes more convenient to work with IPI. Ulyses Balderas & Nath (2008) also used IPI in their monthly data study of remittance, relative price variability and inflation relationship. Remittances, money supply (M2) and government expenditure are taken in real terms by dividing the variables with the GDP deflator. Remittances data are available in millions of US dollars, and have been converted into billions of taka using the nominal exchange rate (BDT per USD). The impact of money supply on food inflation is captured by broad money (M2). Monthly government expenditure data is interpolated from yearly data of Bangladesh Economic Review published by Ministry of Finance, Government of Bangladesh. Additionally, monthly exchange rate data is derived by taking the average of nominal exchange rate for the whole month. These data come from the Monthly Economic Trends of Bangladesh Bank.

The data covers the monthly data for the time period July 2003 to July 2013. The choice of the sample period is dictated as it covers the post floating exchange rate scenario of Bangladesh. The data is collected from Monthly Economic Trends and Major Economic Indicators of Bangladesh Bank, Bangladesh Economic Review of Ministry of Finance and International Financial Statistics (IFS) database of IMF. Almost all the studies in this area are done with yearly data while in this paper we tried to focus on the monthly data. The reason for using monthly data is to better represent the changes in food inflation rate as it is well known that this changes occur very quickly in response to shocks and both the key variables are available in monthly basis.

Definitions & sources of the variables are summarized in Appendix A.1 and statistical descriptions are summarized in Appendix A.2.

Estimation and Discussion of Results

Johansen (1988) and Johansen and Juselius (1990) cointegration technique is used to assess the long run relationship between remittances and food inflation for the time period July 2003 to July 2013. The study has incorporated the following model.

$$\mathrm{FOOD\_CPI}_t = \beta_1 + \beta_2\mathrm{IPI}_t + \beta_3\mathrm{REM}_t + \beta_4\mathrm{GOV}_t + \beta_5\mathrm{M2}_t + \beta_6\mathrm{ER}_t + \omega_t$$

Before doing any estimation, we perform several transformations on our data. First, remittances, money supply and government expenditure are transformed in real terms by dividing the variables with the GDP deflator. After that all the variables are taken in natural logarithm. The log values of the variables are renamed with a LN sign at the front. Then the stationarity of the variables are assessed by testing the presence of unit roots. Cointegration analysis requires that all the variables are to be integrated of same order. We use the Augmented Dickey Fuller (1979) unit root test for checking the stationarity or the order of integration of each variable. The Augmented Dickey Fuller (1979) test is done by estimating the following regression:

$$\Delta Y_t = \alpha \quad + \beta_t + \gamma_i Y_{t-1} + \sum_{i=1}^{n} \lambda_i \, \Delta Y_{t-1} + \varepsilon_t$$

Where Y_t is the variable under consideration, Δ is the first difference operator and α, β, γ, ⊠ are the parameters to be estimated. The test of unit root involves testing,λ =0. The null hypothesis is that the variables have a unit root. The results of the Augmented Dickey Fuller (1979) tests are reported in the Table1.

Table 1: Augmented Dickey Fuller (ADF) Unit Root Tests

Variables	Level		First Difference		Order of Integration
	Statistic	Prob.	Statistic	Prob.	
Food Inflation (LN_FOOD_CPI)	-2.243	0.459	-2.358	0.018	I(1)
Industrial Production Index (LN_IPI)	-1.050	0.931	-3.888	0.003	I(1)
Workers' Remittances (LN_REM)	-1.797	0.699	-13.706	0.000	I(1)
Broad Money (LN_M2)	-1.686	0.751	-5.699	0.000	I(1)
Government Expenditure (LN_GOV)	-2.249	0.457	-4.819	0.000	I(1)
Exchange Rate (LN_ER)	-1.842	0.677	-9.043	0.000	I(1)

According to ADF (1979) test results, for all the variables the null hypothesis of unit root could not be rejected in their levels at 5% level of significance implying they are nonstationary. Given these unit root test results, we transform the nonstationary series to a stationary process by differencing. The first differences of these variables are indeed stationary at 1% significance level. Thus all these variables are claimed to be integrated of order one [I (1)].

After that the optimal lag length is found by using the proper information criteria. At least M2, IPI, GOV and ER contain trends so a linear trend is included in the VAR model. The data for remittances and IPI show seasonality so we add eleven seasonal

Table 2 :

dummies and exclude one to avoid the Dummy Variable Trap. To find out the optimal lag length, we use the Schwarz Information Criterion (SC). The results of the VAR lag selection criteria using SC are reported in the Table 2.

Table 2: VAR Lag Order Selection Criteria

Lag	SC
0	-16.41
1	-28.40
2	-32.87
3	-34.54*

* denotes minimum value according to Schwartz Information Criteria (SC)

SC suggests VAR(3) models which are also the most parsimonious models. The next step involves doing the cointegration test. To determine the existence and the number of cointegrating vectors, Johansen cointegration technique is used. There are two hypothesis tests used for cointegration testing, called the Trace (λtrace) test and Maximum Eigen value (λmax) test. The cointegration test results at 5% level of significance are presented in Table 3. These two tests show that there are two cointegrating vectors among FOOD_CPI, GOV, IPI, REM, ER and M2 as the test value is greater than the critical value. This result also confirms the long run association between the variables of the study. These implications are also supported by the p-values.

Table 3: Johansen Cointegration Test Results

Null Hypothesis	Alternative Hypothesis	Eigen Values		0.05 critical Value	Prob.**
Trace Test			Trace Statistic		
H_0 : r=0	H_1 : r=1	0.613	186.17*	95.75	0.000
H_0 : r=1	H_1 : r=2	0.306	73.96*	69.81	0.022
H_0 : r=2	H_1 : r=3	0.128	30.83	47.85	0.675
Maximum Eigenvalue Test			Max-Eigen Statistic		
H_0 : r=0	H_1 : r>0	0.613	112.20*	40.07	0.000
H_0 : r≤1	H_1 : r>1	0.306	43.12*	33.87	0.003
H_0 : r≤2	H_1 : r>2	0.128	16.20	27.58	0.648

* denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) p-values, Trace and Max-Eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level.

The results of cointegration test are interpreted through Vector Error Correction Model (VECM) which is a restricted version of VAR model designed for non stationary time series. VECM captures the linear relationship among multiple time series by adding error correction features. The error correction term (ECT) tells how much the error is being corrected to a deviation in the long run. The expression used to denote a VECM has the following form: (Nisar & Tufail, 2013)

$$\Delta Z_t = \tau_1 \Delta Z_{t-1} + \tau_2 \Delta Z_{t-2} + \tau_3 \Delta Z_{t-3} + \; .... + \tau_{k-1} \Delta Z_{t-k-1} + \pi Z_{t-1} + u + v_t$$

Where τ_i = (I − A_1 − A_2 .... − A_i); i = 1, 2, 3..... (k−1) and π = − (I − A_1 − A_2 ..... −A_k). The coefficient matrix π provides information about the long-run relationships among the variables in the data. π can be factored into αβ where α will include the speed of adjustment to the equilibrium coefficients while the β will be the long-run matrix of coefficients. The estimates of VECM corresponding to CointEq1 and CointEq2 are summarized in Table 4 for both the models.

Table 4: Comparing the Results of Vector Error Correction Model (VECM) [a]

Regressors	CointEq1		CointEq2	
	Coefficient	t-statistic	Coefficient	t-statistic
IPI	−4.63***	−2.862	2.34***	4.679
Remittances	1.91***	4.535	−0.66***	−5.034
Exchange Rate	1.48*	1.860	−0.52**	−2.108
Broad Money	0.73	0.936	0.002	0.010
Error Correction Term	−0.12***	−5.577	−0.41***	−5.022
	Lags	LM-statistic		p-value
Autocorrelation LM Test	1	40.343		0.284
	2	38.787		0.345
	3	35.696		0.482
N		117		

[a] The regression includes a constant term, *Indicates statistical significance at the 10% level, **Indicates statistical significance at the 5% level, ***Indicates statistical significance at the 1% level

The estimated result (CointEq1) shows that an increase in remittance inflows causes an increase in food inflation at 1% level of significance. The significance of the coefficient at 1 percent level shows the strength of the relationship between remittance inflows and food inflation. Besides workers' remittances, we have also got statistically significant parameters for industrial production index and exchange rate.

While industrial production index has negative effect on food inflation at 1% level of significance, exchange rate has positive effect on it at 10% level of significance. The result also shows that broad money does not have statistically significant effect on food inflation.

The results suggest that 1 percent increase in remittance will cause 1.91 percent increase in food inflation. The result accords with the Bangladesh Bureau of Statistics (2013) findings that the part of the remittance being spent is more or less equally spent on food and non-food items, each accounting for about 39% of the total while 5% on consumer durables. The result also accords with Reinhart and Rogoff (2004) who argued that the effect of remittance inflows will be a rising price level and an appreciation of the exchange rate under the flexible exchange rate regime.

The magnitude of this positive effect of remittances on food inflation happens because most of the migrant households in Bangladesh belong to low or lower middle income brackets. In absence of the remittance money they are not able to spend properly on food to fulfill their demand of nutrition. As their family members and relatives send remittances for their families, there occurs a rise in the household income. This in turn increases the purchasing power of them and they immediately respond by spending more on food consumption since food is the most basic need for them. Once they satisfy their basic need of food then they strive to improve their standard of living. After attaining a reasonable standard of living people are interested in investing in other areas.

The result also indicates that food inflation has shown close magnitude of change in response to 1 percent increase in exchange rate which is 1.48 percent.[2] This is because when the exchange rate depreciates, it increases net exports by making imports dearer. The increase in net exports causes a rightward shift of the aggregate demand curve. For a given aggregate supply, this shift in the aggregate demand will increase the price level. Moreover, a depreciation of the domestic currency usually increases the price of imported consumer goods and durables, raw materials and capital goods thus influencing consumer price index directly. This result is very similar to the results of Narayan et al. (2011) in terms of sign and significance although Khan & Islam (2013) found an insignificant coefficient in their study.

The coefficient for broad money is not significant for food inflation which is a very surprising result. One possible explanation in this case is that the transmission mechanism is indirect and involves the role of interest rate. This may also explain the neutrality of money growth on food inflation for the entire sample period. The broad money may also have negative impact on food inflation as demonstrated by the famous Price Puzzle[3] observed in the US. This insignificant result does not accord well with the findings of Grauwe & Magdalena (2005), Nisar & Tufail (2013) and Khan & Islam (2013) who found a statistically significant positive association between money growth and inflation. However, they have different estimation approaches like some studies use the wholesale prices instead of consumer prices. Particularly, Khan & Islam (2013) who used a sample of yearly data of Bangladesh for the period 1974-2010, thus containing both fixed (1974- July, 2003) and floating exchange rate regimes (after July, 2003) while our sample is entirely after the adoption of the floating exchange rate regime. The choice of both the fixed and floating exchange rate regime in their sample period may also lead to these results which could be biased as suggested by Ball et al. (2013).

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[2] In our study we represent exchange rate as, BDT per USD. Thus an increase in exchange rate implies a depreciation of BDT.

The results show that industrial production index affects food inflation negatively. The explanation comes from the fact that an increase in industrial production index implies that there are more goods and services available in the market for a given amount of money. The increase in the supply of commodities relative to money in the market puts downward pressure on food inflation. On the other hand, the estimated result (CointEq2) shows that an increase in industrial production index leads to a rise and remittances leads to a fall in government expenditure for both models at 1% level of significance. Exchange rate has significant negative effect on government expenditure at 5% level. Broad money remains insignificant.

The ECT represents both the percentage of correlation and the speed of correction to any deviation in the long run equilibrium. The results show that the error correction term for food inflation is negative and statistically significant at 1% level, showing the stability of both the models. Particularly the short run disequilibrium of food inflation is corrected at the rate of 12% per month respectively. Moreover, we use autocorrelation LM test to detect the autocorrelation of the residuals. Results of the LM test suggest the non-violation of no autocorrelation assumptions.

For checking the robustness of the results further, we use log (1+ (FOOD_CPI/100)) instead of food inflation as suggested by Narayan et al. (2011).[4] We find that remittances growth rate has a significant positive effect on food inflation at 1% level. All other variables of the two models have coefficients with similar sign and significance as reported previously.

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[3] A rise in the aggregate price level in response to a contractionary innovation to monetary policy.

[4] The results of the robustness check are provided in the Appendix A.4.

We must mention some caveats that remain in the study. First, it was really difficult to get monthly data for all of the variables. For some of the variables the monthly data is interpolated from the yearly data. These interpolations might produce some bias in the results. Second, most of the remittances in Bangladesh flow to the rural areas while CPI calculation is based on the cities. Third, remittances that come through informal channels are not taken into account thus the data on remittances may be under reported. The unofficial channels normally dominate in Bangladesh as they are not only less expensive but also more easily accessible (Barua et al., 2007). Moreover, some of the remittances come in the form of gifts (goods) and the extent and effects of those are very hard to measure (Ulyses Balderas & Nath, 2008). Fourth, in the literature there is no agreement on a common set of determinants of food inflation. For example, some studies suggest that there should be a variable in the model representing trade openness where more openness can reduce food inflation as suggested by Romer (1993). These issues can be addressed in further research on this topic.

Conclusions

Workers' remittance inflows have emerged as a crucial issue for the fiscal and monetary policy of Bangladesh. Emigrants send remittances to benefit their families living in their origin country. These inflows also benefit the recipient country by lowering poverty, funding investment and earning foreign exchange. But at the same time like other capital inflows remittances have the potentiality to induce an inflationary pressure for the food items in the recipient country. By using Johansen (1988) and Johansen & Juselius (1990) cointegration technique and VECM approach, we checked this relationship empirically for Bangladesh. The results show that all the explanatory variables explain the changes in food inflation in statistically significant way except broad money. The results also indicate that remittance inflows are positively associated withnbfood inflation. Particularly, we find that a percent increase in remittances inflows will increase food inflation by 1.91%. Apart from remittances; industrial production index has negative effect on food inflation while exchange rate has positive effect on it. One of the unexpected and interesting results is that broad money does not have statistically significant effect on food inflation which demonstrates the neutrality of money growth over inflation for the entire sample period. The study reveals the need to more deeply understand the economic impacts of incoming workers' remittances. We provide empirical evidence showing that remittances can induce food inflation of the recipient economies. It implies that remittances are more guided towards food consumption of the recipient households. Most of these households belong to low or lower middle income brackets. In absence of the remittance money they are not able to spend properly on food and fulfill their demand for nutrition. Remittance inflows increase their purchasing power and they immediately respond by spending more on food consumption. Thus remittances contribute significantly towards the development of the health status of the recipient families. But as the households continuously receive remittances they will become more solvent. After attaining a reasonable standard of living, they will look upon investing in other areas. If these investments are not properly channelized in the productive sectors, they can create booms in other markets. Thus in future it is expected that the result of inducing food inflation will spread in other areas too. As inflation may have some welfare costs, policies should be taken to guide remittances from consumption motives to investment in productive sectors that causes economic growth. In this context, the development of the financial sector can also play a role in channelizing remittances into productive investment through developing investment opportunities like secondary bond market.

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Appendix

A.1. Definitions and Sources of Variables

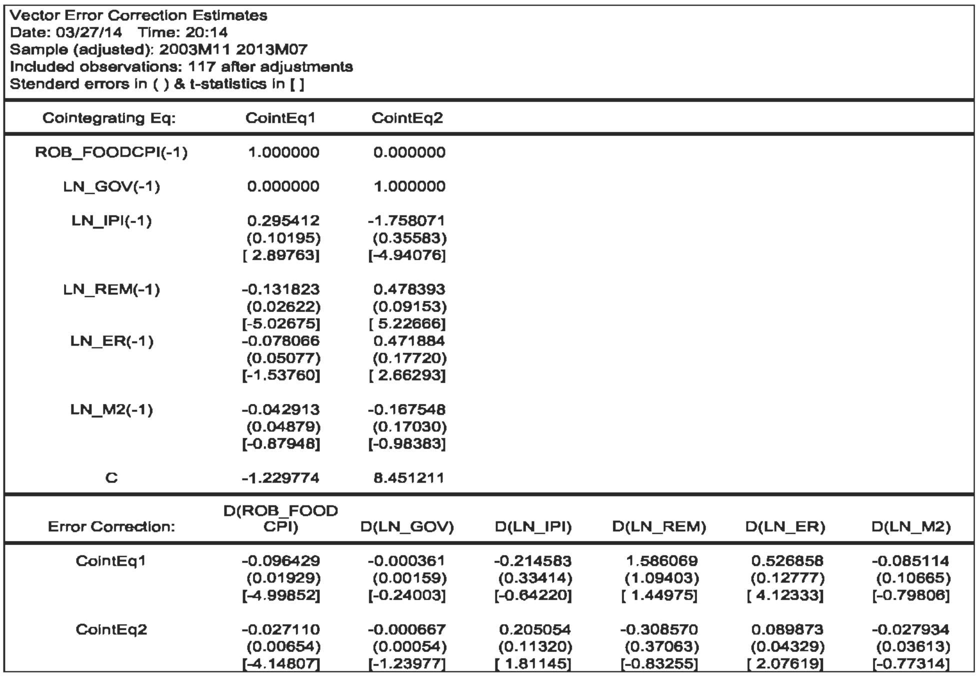
Variables	Definitions	Sources
Food Inflation (FOOD_CPI)	12 Month Average FOOD CPI	Monthly Economic Trends, Bangladesh Bank
Government Expenditure* (GOV)	Government Consumption Expenditure (Billion Tk.)@	Bangladesh Economic Review, 2013
Industrial Production Index (IPI)	Monthly IPI	International Financial Statistics (IFS) Database, 2013
Workers' Remittances* (REM)	Monthly Remittance Inflows (Billion Tk.)	Major Economic Indicators, Bangladesh Bank & Migration and Remittances Data, World Bank, 2013
Exchange Rate (ER)	Monthly Average Exchange Rate (BDT per USD)	Monthly Economic Trends, Bangladesh Bank, 2014
Money Supply* (M2)	M2 (Billion Tk.)	Monthly Economic Trends, Bangladesh Bank, 2014

* deflated by using GDP deflator @ interpolated from yearly data

A.2. Statistical Description of the Variables

Variable	CPI	FOOD_CPI	GOV	IPI	REM	ER	M2
Mean	7.634	8.617	0.416	125.865	0.287	69.373	16.326
Maximum	10.960	12.900	0.636	178.156	0.533	83.420	26.281
Minimum	4.510	3.830	0.282	75.800	0.106	58.400	9.149
Std. Dev	1.673	2.197	0.099	27.397	0.105	6.496	5.147
Observations	121	121	121	121	121	121	121

A.3. VECM Results [Using (*log (1+ (FOOD_CPI/100))* instead of Food Inflation]



```
Vector Error Correction Estimates
Date: 03/27/14   Time: 20:14
Sample (adjusted): 2003M11 2013M07
Included observations: 117 after adjustments
Standard errors in ( ) & t-statistics in [ ]

 Cointegrating Eq:      CointEq1     CointEq2

 ROB_FOODCPI(-1)        1.000000     0.000000

    LN_GOV(-1)          0.000000     1.000000

    LN_IPI(-1)          0.295412    -1.758071
                       (0.10195)    (0.35583)
                       [ 2.89763]   [-4.94076]

    LN_REM(-1)         -0.131823     0.478393
                       (0.02622)    (0.09153)
                       [-5.02675]   [ 5.22666]
    LN_ER(-1)          -0.078066     0.471884
                       (0.05077)    (0.17720)
                       [-1.53760]   [ 2.66293]

    LN_M2(-1)          -0.042913    -0.167548
                       (0.04879)    (0.17030)
                       [-0.87948]   [-0.98383]

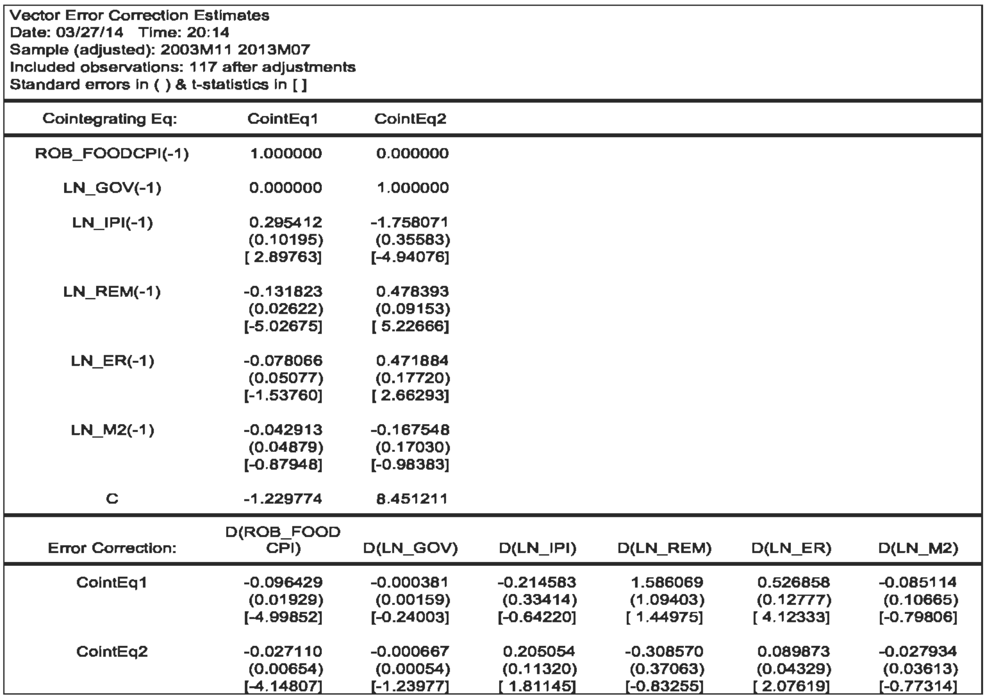
        C              -1.229774     8.451211

                      D(ROB_FOOD
 Error Correction:       CPI)       D(LN_GOV)    D(LN_IPI)    D(LN_REM)    D(LN_ER)     D(LN_M2)

     CointEq1          -0.096429    -0.000361    -0.214583     1.586069     0.526858    -0.085114
                       (0.01929)    (0.00159)    (0.33414)    (1.09403)    (0.12777)    (0.10665)
                       [-4.99852]   [-0.24003]   [-0.64220]   [ 1.44975]   [ 4.12333]   [-0.79806]

     CointEq2          -0.027110    -0.000667     0.205054    -0.308570     0.089873    -0.027934
                       (0.00654)    (0.00054)    (0.11320)    (0.37063)    (0.04329)    (0.03613)
                       [-4.14807]   [-1.23977]   [ 1.81145]   [-0.83255]   [ 2.07619]   [-0.77314]
```

A.4. VECM Results [Using (*log(1+(FOOD_CPI/100))* instead of Food Inflation]



```
Vector Error Correction Estimates
Date: 03/27/14   Time: 20:14
Sample (adjusted): 2003M11 2013M07
Included observations: 117 after adjustments
Standard errors in ( ) & t-statistics in [ ]

 Cointegrating Eq:      CointEq1     CointEq2

 ROB_FOODCPI(-1)        1.000000     0.000000

    LN_GOV(-1)          0.000000     1.000000

    LN_IPI(-1)          0.295412    -1.758071
                       (0.10195)    (0.35583)
                       [ 2.89763]   [-4.94076]

    LN_REM(-1)         -0.131823     0.478393
                       (0.02622)    (0.09153)
                       [-5.02675]   [ 5.22666]

    LN_ER(-1)          -0.078066     0.471884
                       (0.05077)    (0.17720)
                       [-1.53760]   [ 2.66293]

    LN_M2(-1)          -0.042913    -0.167548
                       (0.04879)    (0.17030)
                       [-0.87948]   [-0.98383]

        C              -1.229774     8.451211

                      D(ROB_FOOD
 Error Correction:       CPI)       D(LN_GOV)    D(LN_IPI)    D(LN_REM)    D(LN_ER)     D(LN_M2)

     CointEq1          -0.096429    -0.000381    -0.214583     1.586069     0.526858    -0.085114
                       (0.01929)    (0.00159)    (0.33414)    (1.09403)    (0.12777)    (0.10665)
                       [-4.99852]   [-0.24003]   [-0.64220]   [ 1.44975]   [ 4.12333]   [-0.79806]

     CointEq2          -0.027110    -0.000667     0.205054    -0.308570     0.089873    -0.027934
                       (0.00654)    (0.00054)    (0.11320)    (0.37063)    (0.04329)    (0.03613)
                       [-4.14807]   [-1.23977]   [ 1.81145]   [-0.83255]   [ 2.07619]   [-0.77314]
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Training Needs Assessment (TNA) in Banks of Bangladesh: Conceptual Framework and Present Scenario

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Abstract:

Training plays a vital role in the success of any kind of organizations. Profitability and sustainability of the banking sector also depend to a great extent on the service of its employees. Before delivering any kind of training, banks are required to identify the Training Needs Assessment (TNA) within their organizations in order to succeed and attain the desired outcomes of the training programs. This study is an endeavor to examine the present status of training needs assessment and the readiness of banks about the implementation of training needs assessment in the banking sector of Bangladesh. The study finds that commercial banks of Bangladesh need to put some further endeavor to introduce TNA effectively in order to get benefit from it. However, the findings of the study would be useful for commercial banks to introduce TNA in an effective manner in the banking sector of Bangladesh.

*Key Words: Training Needs Assessment, Commercial Banks, Training,
Human Resource Department*

1. Introduction

The banking sector of Bangladesh has been playing a vital role in the socio economic development of the country. The Government of the People's Republic of Bangladesh established training and development policy by formulating National Training Council in 1983. Banking is a principal mover in the economic and social development of a nation and banking training is very essential to improve its success. Commercial banks in Bangladesh should have a clearly defined strategy, policy, techniques and objectives that direct all the decisions made especially for effective training decisions. Moreover, commercial banks should plan their training process to be more successful. Effective training helps to achieve banking goals and targets. Training makes employees more equipped to reach their desired goals. Therefore, TNA can play a vital role to ensure ultimate effectiveness of the training and development programs offered by banks.

The banking sector has come to rely on training to develop professional and technical competencies of their employees in order to increase profitability and sustainability by improving service. Berger (2002) states the expenditure on human resource is imperatively high rising. Given the role of training as a business strategy it is important that any training effort be targeted and relevant. Thus, the process by which training needs are identified and addressed becomes a critical issue for organizations. Training is most effective when it addresses the specific training needs of banks and financial organizations. In order to ensure that training has the maximum effect it should be well designed and targeted towards the right employees. Individual training needs are often identified by employees, supervisors and managers and should include training which is needed to effectively perform assigned or planned duties. This type of training generally produces an immediate or short-term return on the training investment in form of improved performance, increase in sales and achieving assigned targets.

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Thus, Training Need Analysis helps the organizations in determining the areas where training is required; planning the budget of the bank for training and highlight the areas where alternate actions could be taken but training might not be required. Training needs assessment is concerned with the achievement of a desired level of proficiency and the attainment of requisite knowledge and skills. Therefore, training needs assessment is a two-fold process that involves establishing indicators of learning or training transfer and determining exactly what job related changes have occurred as a result of training (Goldstein, 2001).

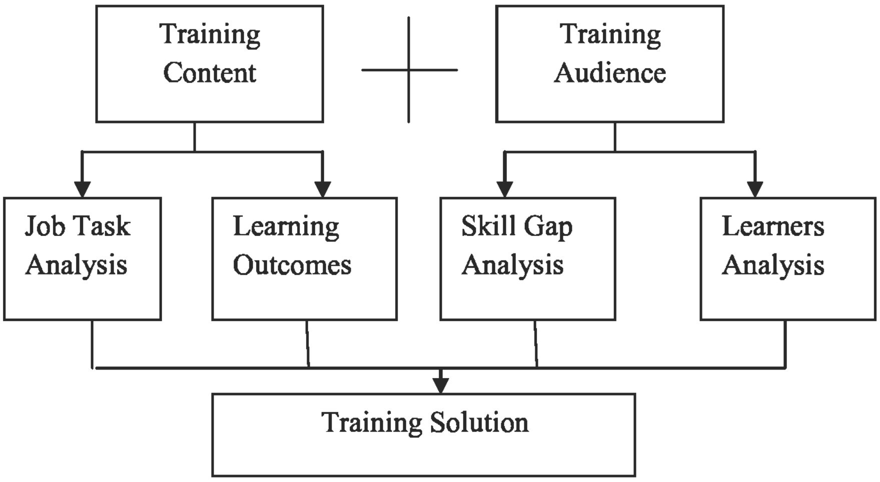
Conducting a well planned Training Needs Analysis (TNA) in any bank will determine how many bank employees are perfectly trained to perform their assigned tasks. In addition, this process will also allow comprehensive customization of training programs for all departments to meet the training and development needs of the employees and also to meet the market competitiveness. A training needs assessment would ensure that training programs are focused and appropriate. For sure, training cannot be conducted just for the sake of it; it is a luxury that no organization can really afford. Sometimes, banks may not have the expertise to conduct in-depth training needs analysis to determine what the real training issues are, in that situation bank may hire a professional organization to conduct TNA for them.

Conducting formal and informal surveys with employees could beneficial because many people can be questioned in a short span of time. Moreover, they also provide the employees with the opportunity to acknowledge their needs on paper which they may be too embarrassed to admit needing in a face-to-face meeting. Most frequently Employee Opinion Surveys and 360 degree Peer Review Surveys are conducted to provide to most valid and useful information regarding the training needs of employees.

Focus groups discussions may be conducted to facilitate group interaction; this kind of discussion allows the assessors to discover details regarding their target audience. Brainstorming is encouraged allowing for an exchange of new ideas and a revelation of what training may be needed could be very helpful to pen down the learning outcomes of the training programs.

Evaluate company Strategies and Objectives a brief review of the organizations past and where they are heading for in the future may reveal valuable information for training. A comparative analysis should be made of what employees are currently doing and what will be expected of them as the company continues to grow and expand. Comparative work output charts will be helpful to determine the level of improvement in the employee from time to time. Organizations in the service sector need to conduct training needs analysis to start program on the right track (Figure 1) shows a general model of training needs assessment for the service sector as bank belongs to the service sector so commercial banks may consider this model.

Figure 1: General Model of Training Needs Assessment



Source: Association for Talent Development, LA Learning, Los Angeles, USA

The model below shows how both of these key outcomes are created through a series of processes that lead to a fully-conceptualized training solution, the end product of training needs assessment. To understand how this works, consider the four boxes in the middle of the model. Content typically rely on two processes – job task analysis and establishing learning outcomes. Job tasks analysis is a process that breaks jobs into outcomes, outcomes into tasks, tasks into steps, and steps into knowledge. In this model training audience means bank officials willing to receive training. Skills gap of the audience also identified here as well as learner's analysis also conducted to acquire the ultimate training solution.

2. Literature Review

The primary purposes of training needs analysis is to examine the viability, success rate and utility of implemented training programs. Without this information, no clear conclusions about the effectiveness of programs can be made. Nor organizations cannot make decisions regarding where to make revisions or updates to current programs (Robbins and Coulter, 2005). Although the terms training needs analysis, training evaluation or training effectiveness are sometimes used interchangeably, several authors have noted subtle differences between the two (Kraigeret et al. 2003). Hence, training effectiveness is a broad construct that identifies situational or contextual factors impacting learning, retention and transfer. This focus is critical for uncovering whether a training program was effective or ineffective due to characteristics of the program or to factors outside the control of the training system (Ford, 2006).

Training needs assessment is traditionally regarded as a diagnostic process that occurs before training. The purpose of formal needs assessment is to identify the training targets (Kozlowski & Salas, 2003). In the past, there has been disagreement about the appropriate terminology to describe this process. Some authors choose to distinguish needs assessment from needs analysis. For example, Kaufman and Valentine (1999) refer to needs assessment as the process for identifying and prioritizing gaps in performance. In contrast, they define needs analysis as the process for attributing cause to identify performance gaps. Hence, the entire process will be referred as needs assessment. So, once training has been conducted, a comprehensive evaluation should follow.

Moreover, the most widely-used evaluation model was developed and revised by Kirkpatrick (1994). In this model, training may be evaluated at four different levels. Level one evaluation centers around the general affective reaction participants have to the program. Level two evaluation focuses on demonstrated mastery of concepts in training. Level three evaluations go a bit further and focus on a demonstrated behavior change on the job. At level four, training is assessed by whether or not it impacts organizational results. In recent years, this taxonomy has been expanded to include additional evaluative criteria such as return on investment (ROI) and cost/utility analyses (Phillips, 2002).

Moyeen et el (2001) found a positive relationship between training programs and employee's job involvement. Hughey and Mussnug (1997) found a positive correlation between the employee training and employee & job satisfaction. In addition to the basic training required for a trade, occupation or profession, observers of the labor-market recognize the need to continue training beyond initial qualifications: to maintain, upgrade and update skills throughout working life. People within many professions and occupations may refer to this sort of training as professional development (Rahman, M.A, 2012). The instructional design process revolves around four basic steps: organizational objectives, needs assessment, training design, and training evaluation. Garavan et al. (2003) found that training process is more job oriented that can change employee attitudes and behaviors.

Debnath (2003) also indicates that productivity of manpower in the banking sector of Bangladesh can be increased by proper training both on the job and off the job. Moreover, Decenzo & Robins (2003) state “training brings about the changes in ability, awareness, approach and behavior”. Besides, Griffin (2003) supports training usually in human resources management perspective refers to teaching operational and technical employees as to how to do the job for which they were hired. Furthermore, Mathis & Jackson (2004) state ‘training as a procedure whereby people obtain capabilities to assist in the accomplishment of organizational objectives’. Besides, McGehee and Thayer (1999) support training as, “the formal procedures a company uses to facilitate employees’ learning so that their resultant behavior contributes to attainment of the company’s goals and objectives”. More specifically, training is a systematic approach to skills and knowledge acquisition or attitudinal enhancement that improves performance (Goldstein, 2001).

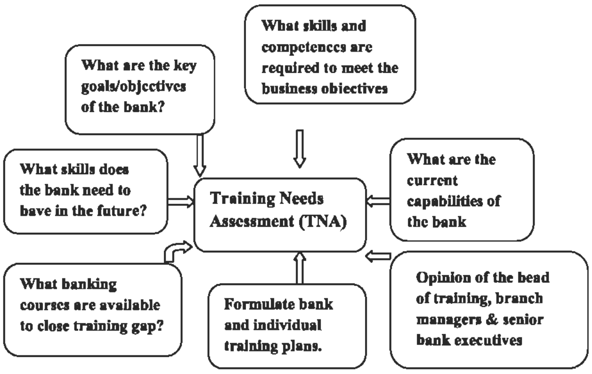
Bhatnagar (1983) the immediate objective of the training should be to help the participants perform more effectively the activities enrolls they are performing at presents. The training programs for branch manager should be design around the specific skills required by them. Patel (1984) many of the problems of the banking in rural areas and the apprehensions arising from such problem were largely due to inadequate understanding of the rural areas, activities and the people. Even the lack of orientation in some quarters was largely due to this knowledge gap, the gap in the information and knowledge had created a situation where in the banking norms developed for other sectors which were not generally relevant to the rural areas were applied blindly. Padwal and Naidu (1985) training needs help to identify existing training gap, what type of training can be under taken by outside agencies, and accordingly schedule the training programs for the bank staff.

Glaveli and Rainaye (2004) in their study empirically examined the training policy in two commercial banks, namely, State Bank of India and Jammu & Kashmir Bank Limited. The focus was on the various facets of training including Management’s attitude towards training, training inputs, quality of training programs and transfer of training to the job.

Rothwell, (2002) indicates effective training as systematically designed learning, based on a complete analysis of job requirements and trainee compatibility. This clarification implies a definite training process, one highly regarded model for describing the systematic development of training programs is the instruction design process. This model states that there should be a logical flow in training practice moving from planning to implementation to evaluation. The instructional design process revolves around three basic steps: needs assessment, training design and training evaluation.

However, what should the standard model for TNA in banks? Figure 2 shows a model for TNA applicable for banks. At the initial stage a bank needs to consider its goals and objectives such as a banks vision, mission, goals, objectives etc. Then, the bank should identify what skills and competences are required to meet these business objectives of the bank. Skills may be technical, human, conceptual, IT skills, programming etc. For the managers bank may require more soft skills related training programs on the other hand, core operational training courses are required for the operational level bank officials. Subsequently, bank needs to identify the current capabilities or current competency level of the bank employees. Here, bank can take interview or written test of the employees to judge their existing level of competences. Based on the results of the existing level of capabilities the employee's bank should formulate overall bank and individual training plan. Opinion of the head of training, branch managers or top bank executives should be considered here because they are also stake holder of the TNA process, thus bank should consider their valuable opinion while designing training needs of the bank officials. Then the bank should know which courses are available to reduce the training gaps and what skills do the bank need in future? Here gap indicates the difference between desired level of competencies of the bank officials and the existing level of competencies of the bank officials.

Figure 2: Training Needs Assessment Model in Banks (TNA)


What skills and competences are required to meet the business objectives
What are the key goals/objectives of the bank?
What skills does the bank need to have in the future?
Training Needs Assessment (TNA)
What are the current capabilities of the bank
What banking courses are available to close training gap?
Formulate bank and individual training plans.
Opinion of the head of training, branch managers & senior bank executives

Source: Developed by the Author Accommodating Mount Talent Consulting Model

3. Objectives

Considering the above background the objectives of the study are as follows (i) To see the present status of TNA in the banking sector of Bangladesh (ii) To find what are the factors preventing bank officials from achieving training (iii) To recommend some suggestions for improving TNA practice in the banking sector of Bangladesh.

4. Methodology

Both primary and secondary data have been collected in the study. Primary data have been obtained through a sample survey. The respondents were from different commercial banks in Bangladesh. The design of the questionnaire involves a combination both open and close ended questionnaires. A total number of 156 bank officials of the training division, branch managers and senior executives from Officer to Senior Vice President have been interviewed and 23 sample banks (covering 3 state owned, 14 local private commercial banks, 4 Islamic, 2 foreign banks) have been covered based on purposive sampling techniques. For theoretical framework of the study relevant articles, journals, text books and research work were consulted.

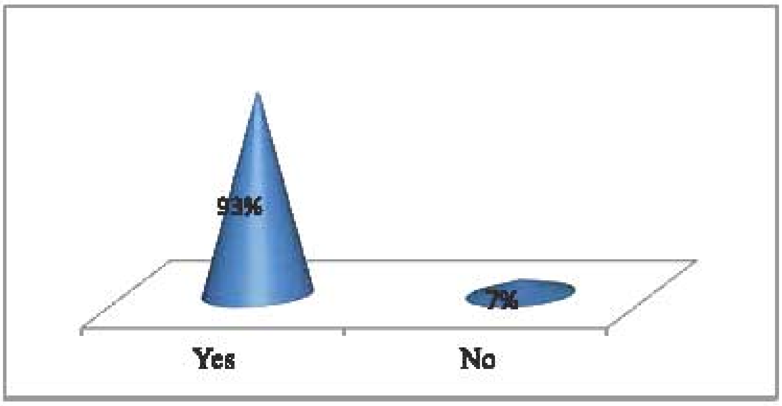
The analyzed data have been presented through graphs and figures. The study suffers from some limitations such as small sample size, and narrow scope. However, the study suggests in-depth study on this issue in future taking large sample size with wide scope.

5. Analysis and Findings

To know the current status of banks about Training Needs Assessment (TNA) the study conducted a primary survey and some findings of the study are given below:

The study tries to identify whether training needs assessment exist in the banking sector of Bangladesh (Figure3). In reply to this question 93% bank officials opined yes response to this question. Therefore, it has been found that, a majority portion of banks have introduced training needs assessment. However, through consultation with the bank officials it has been found that some banks are not fully equipped to practice TNA, although they have given yes response to this question.

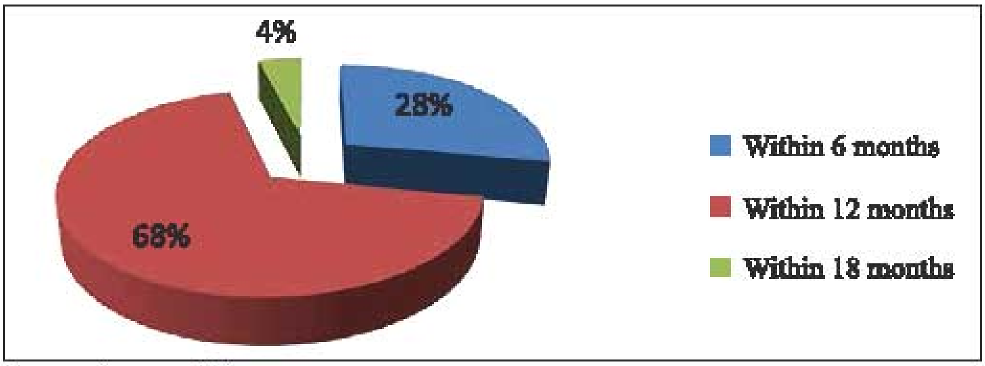
Figure 3: Response of the Bank Officials Regarding Training Needs Assessment.



Source: Survey Data

The study finds that (Figure 3) 7% banks so far did not introduce TNA, thus the study tries to find out how long it will take to introduce TNA plans. In reply to this question the study finds that 28% banks will introduce TNA within 6 months, 68% banks will establish TNA within 12 months and 4% banks will initiate TNA within 18 months. Thus, almost all banks will introduce TNA within a short span of time which is a good sign for the banking sector of Bangladesh.

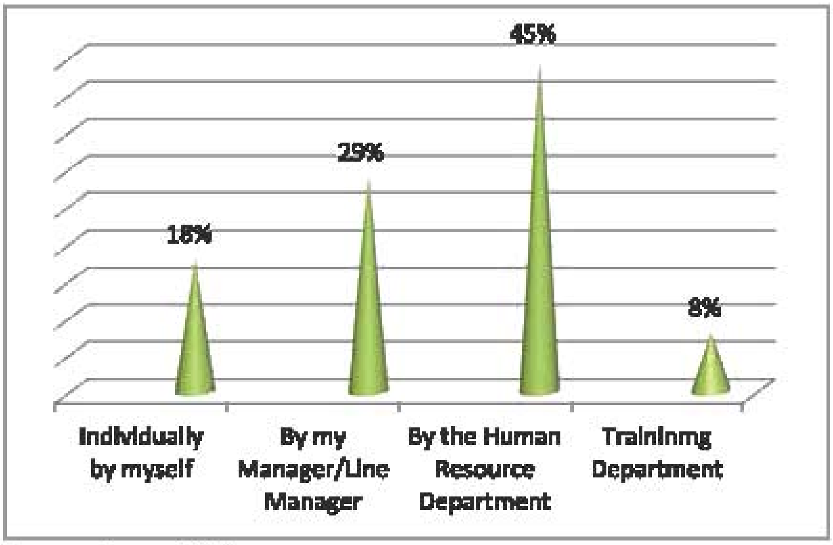
Figure 4: How far into the Future Does this Assessment Plan for?



Source: Survey Data.

The study also tries to identify how bank official's future training and professional development needs are assessed (Figure 5). Generally, TNA assumes that individual bank official will decide his or her training and professional development requirement, however the study finds that in only 18% case, bank official's future training and professional development is decided by them. 29% bank officials opined that training requirement is decided by their managers or line managers, 45% bank officials opined that training requirement is determined by their human resource department and only 8% bank officials opined that their training department decides their training requirement. If TNA form is filled by the line managers, then line managers must discuss with the concerned officials about their training and developmental issues.

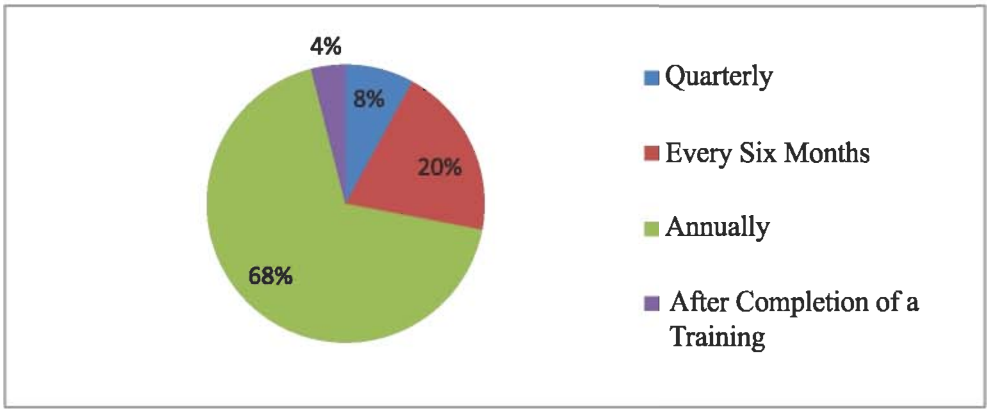
Figure 5: How Does Bank Official's Future Training and Professional Development are assessed?



Source: Survey Data.

How often bank officials identified training needs reviewed in the period from one assessment to the next? In reply to this question (Figure 6), the study finds that 20% banks do it after every six months, 68% banks do it annually, 8% banks do it quarterly and 4% banks do it just after completion of a particular training program. If any bank conducts TNA just after completion of a particular training program, then it will be very effective because immediately training participants can give good feedback about a training program that they have just received. Therefore, the study finds that a major portion of banks reviewed training needs assessment annually. It has been found through consultation with the bank officials that in some cases banks conduct TNA at the time of their employee performance.

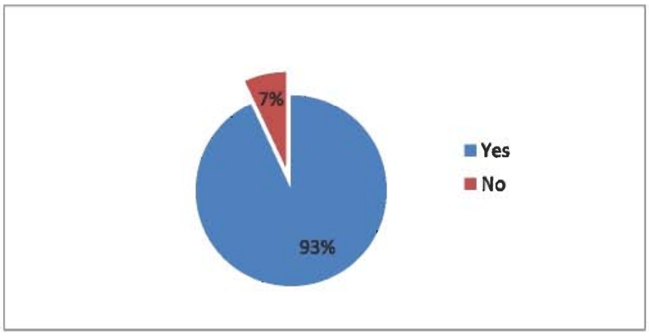
Figure 6: TNA Assessment Period



Source: Survey Data

Whether banks have approved format of TNA? (Figure 7) In reply to this question the study finds that 84% banks have approved format of TNA and 16% banks do not have specific format for TNA. However, it has been also found through consultation with HR officials of banks that, some of the banks practice TNA in their banks but they do not have specific TNA form; they usually use employee performance appraisal form as TNA form. In this form the line manager indicates that what type of training is needed by his/her junior colleagues. Nevertheless, conducting TNA through performance appraisal form is not a good practice. TNA should be conducted through proper format if banks wish to get appropriate benefit from it.

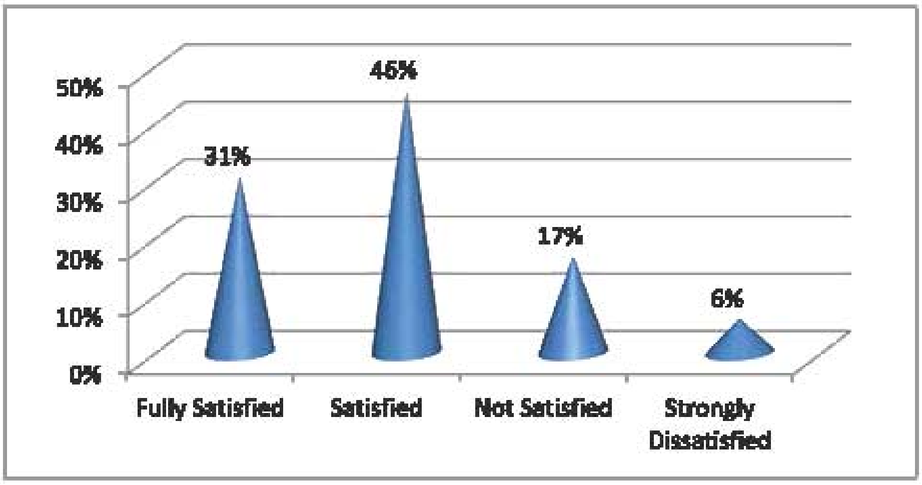
Figure 7: Whether banks have approved format of TNA?



Source: Survey Data

The study also tries to identify the level of expectation of the bank employees about training and professional development programs undertaken by their banks (Figure 8). Thus the study finds that 31% bank officials are fully satisfied about the training and professional development programs provided by their banks, 46 % bank officials are satisfied in this issue, 17% bank officials are not satisfied in this issue and 6 % bank officials are strongly dissatisfied about the training and professional development programs provided by their banks.

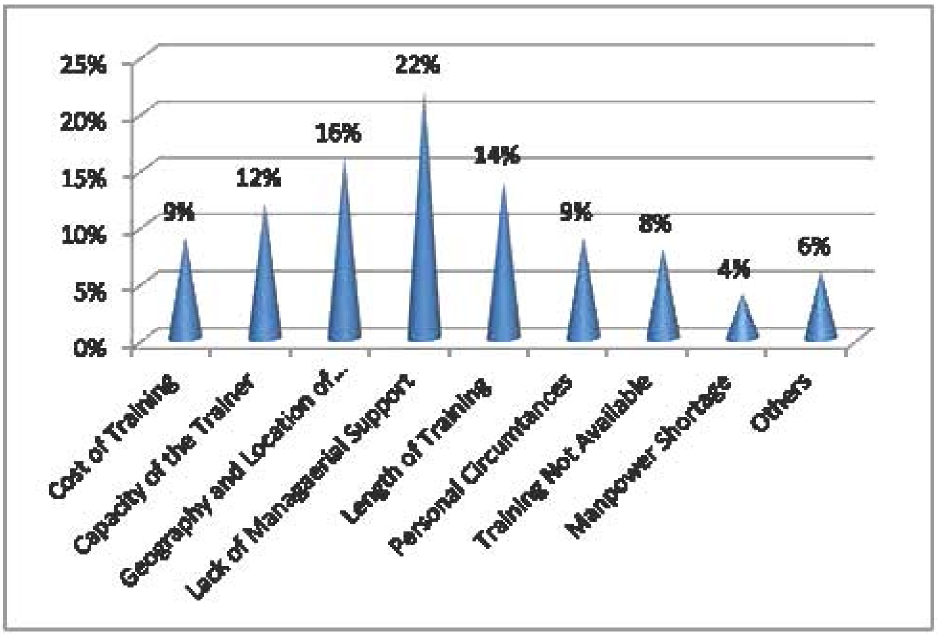
Figure 8: Level of Expectation about Training and Professional Development Programs of Banks.



Source: Survey Data

What are the factors preventing bank officials from meeting or achieving training or professional development? (Figure -9) In reply to this question the study finds some vital factors preventing bank officials to receive training or professional development such as cost of the training, capacity of the trainer, lack of managerial support, length of training, personal circumstances, location of training venue, manpower shortage etc. Commonly, banks arrange training in their own training institute and most of the cases banks own training institute located in Dhaka city except state owned commercial banks. State owned commercial banks have regional training institute. Banks also send participants in some banking training institute such as Bangladesh Institute of Bank Management (BIBM), Bangladesh Bank Training Academy (BBTA). These institutes are also located in Dhaka. Through consultation with the bank officials, it has been found that trainee's geographical location is a vital factor to get the chance of training. Bank officials who are working outside Dhaka usually get less chance of training; here cost is also a significant factor, since-banks have to pay TA/DA for the bank officials who are working outside Dhaka and willing to receive training in Dhaka. Lack of managerial support is reported as one of the vital reason for not to get training, which is 22%. Here lack of managerial support indicates immediate supervisor's recommendation for nomination in the training program. Manpower shortage found as one of the factor preventing bank officials from receiving training, which is 4%. It has been observed that, private commercial banks of our country are suffering from manpower shortage, thus branch mangers do not feel comfortable to nominate bank officials in training programs.

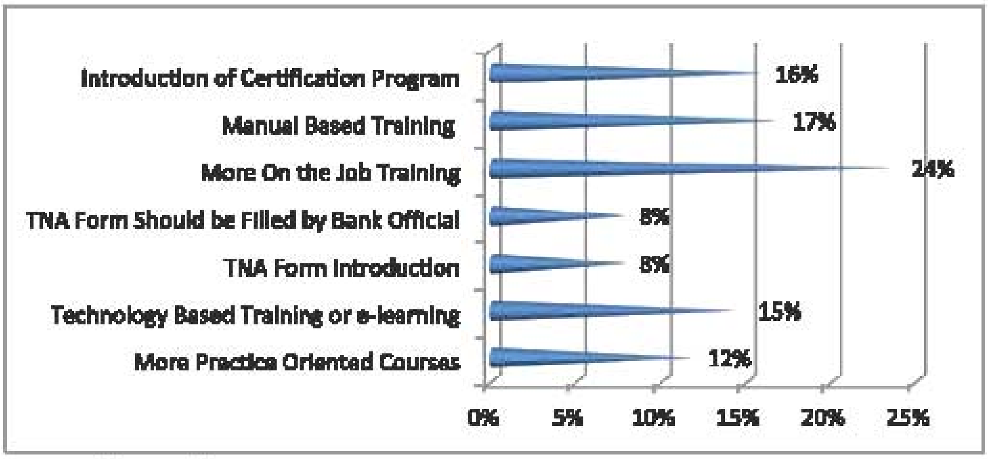
Figure 9: Factors Preventing Bank Officials from Achieving Training or Professional Development



Source: Survey Data

Training Needs Assessments must be customized to fit the needs of the banks. Individual bank should decide their TNA based on opinion of the bank officials. Therefore, the study also tries to identify how TNA process of banks could be improved. (Figure 10) In reply to this question bank officials have given some opinions about how to improve TNA process. Now a day on the job training is gaining popularity. On-the-job training is training that takes place while employees are actually working. It means that skills can be gained while trainees are carrying out their jobs. The study finds that bank officials are more enthusiastic about on the jobtraining; accordingly 24% bank officials have given their opinion about more focus on the job training to improve TNA. Introduction of certification based training and manual based training are also important suggestions of the bank officials to improve TNA. Technology based training or e-learning is another significant proposal of the bank officials in this regards and therefore 15% bank officials have given their opinion about introduction of technology based training or e-learning. Since, with the help of e-learning bank officials can receive training without physical movement from one place to another place. However, 8% bank officials opined that every bank should have specific TNA form and TNA form should be filled by the concern bank officials not by the managers or by the departments.

Figure 10: How to Improve TNA in Banks?



Source: Survey Data.

6. Conclusion and Recommendations

This study aims at showing the current status of TNA and the readiness of banks to introduce TNA in the banking sector of Bangladesh. The study finds most of banks have already introduced TNA in their banks; few banks not yet introduced TNA. However, these banks will introduce it within a short period of time. Some officials opined that training and professional development are assessed by them. Still, bank official's future training and professional development are assessed by the human resource department or by their line managers, which is not a superior TNA practice by the banks. It is better if bank employees fill TNA form through consultation with his/her line managers. It has been revealed from the study that a majority portion of banks reviewed training needs assessment annually. However, banks can extend TNA period considering employees career progression which may be 2 to 5 years. The study also finds that a most of the banks have approved format of TNA which is a good sign. Nevertheless, some of the banks use employee performance appraisal form for TNA. However, banks should have separate TNA form. The study finds some vital factors preventing bank officials to receive training or professional development such as cost of the training, capacity of the trainer, lack of managerial support, length of training, personal circumstances, location of training venue, manpower shortage etc. Thus, banks should consider these factors sincerely to ensure efficient training and development. Finally, the study finds some suggestions from bank officials to improve TNA such as introduction of certification program, manual based training, more on the job training and technology based training or e-learning, separate TNA form introduction etc.

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A SURVEY OF ECONOMIC SITUATION IN BANGLADESH: July-December 2015

The major macroeconomic indicators including real, external and financial sectors recorded moderate growth during the second half of FY15. During July-December 2015 moderate growth in broad money helped to keep inflation lower and foreign exchange reserve increased due mainly to increase in export and remittances. Annual average inflation went down to 6.19 percent at the end of December 2015 which was 6.40 percent in July 2015 and 6.99 percent in December 2014. Total export earnings during July-December 2015 showed an yearly increasing trend given with the increased export of engineering products, agricultural products, chemical products, leather & leather products, jute & jute goods and some other goods, etc. During July-December 2015, higher import of iron and steel, Plastic and articles thereof, mineral fuel, mineral oils and product of their distillation, bituminous substances etc. led to yearly rise of import.

Monetary and Credit Situation

Narrow money (M1) recorded an increase of TK. 7505.10 crore or 4.67 percent to TK. 168319.30 crore during July-December 2015 as compared to the increase of TK. 12781.50 crore or 8.63 percent during January-June 2015 and the increase of TK. 6387.60 crore or 4.51 percent during July-December, 2014.

Broad money (M2) recorded an increase of TK. 50500.10 crore or 6.41 percent to TK. 838114.20 crore during July-December 2015 as compared to the increase of TK. 46365.80 crore or 6.26 percent during January-June 2015 and the rise of TK. 40624.80 crore or 5.80 percent during the corresponding period of the preceding year. The rise in broad money during the period under report was brought about mainly by an increase in demand deposits by 3.98 percent and an increase in time deposits by 6.86 percent. Currency outside banks also rose by TK. 4604.50 crore or 5.24 percent to TK. 92545.30 crore during the period under review.

An analysis of the causative factors of the change in money supply revealed that net foreign assets increased by TK. 20088.60 crore or 10.62 percent while net domestic assets of the banking system increased by TK. 30411.50 crore or 5.08 percent during July-December 2015. The increase in net foreign assets is the major factor of net expansionary impact of broad money during the period under report. On the other hand, net foreign assets and net domestic assets rose by 13.11 percent and 4.26 percent respectively during January-June 2015.

Total domestic credit recorded an increase of TK. 39117.90 crore or 5.58 percent to TK. 740644.40 crore during July-December 2015 as compared to the increase of TK. 27791.90 crore or 4.13 percent during January-June 2015 and a rise of TK. 35828.40 crore or 5.62 percent during the same period of the previous year. The rise in domestic credit during the period under report was mainly due to the increase in private sector credit by 7.99 percent.

Reserve money recorded an increase of TK. 11732.30 crore or 7.90 percent to TK. 160214.80 crore during July-December 2015 as compared to the increase of TK. 9338.10 crore or 6.71 percent during January-June 2015 and an increase of TK. 9269.10 crore or 7.14 percent during the corresponding period of the previous year.

Auctions of Government Treasury Bills

Twenty six weekly auctions of each of the 91-Day, 182-Day and 364-Day Government Treasury Bills were held during July-December 2015. In all, 1843 bids for a total of TK. 113977.94 crore (face value) were offered in the auctions of which 485 bids for a total of TK. 34250.00 crore (face value) were accepted. Bills worth of TK. 36913.00 crore were retired during the period under report and the outstanding balance of the bills stood at TK. 68316.00 crore at the end of December 2015. A brief summary of the auctions of Treasury Bills of different tenors is given in the Table-1.

Table-1

Bangladesh Government Treasury Bills Auctions: July-December 2015

(Crore Taka)

Tenors of Treasury Bills	Bids offered		Bids accepted		Amount of retired bills	Outstanding bills as on December 2015	Range of W.A. Yield of accepted bids (%)
	No. of bids	Face value	No. of bids	Face value			
1	2	3	4	5	6	7	8
91-Day	840	60808.45	205	18600.00	18913.00	18600.00	2.45-5.56
182-Day	522	29730.11	122	8500.00	7900.00	17650.00	3.22-6.30
364-Day	481	23439.38	158	7150.00	10100.00	32066.00	3.74-6.67
Total	1843	113977.94	485	34250.00	36913.00	68316.00	2.45-6.67@

Note: @ Overall range of the yield of treasury bills of different maturities.
Source: Monetary Policy Department, Bangladesh Bank.

Auctions of Bangladesh Government Treasury Bonds (BGTBs)

Twenty four auctions of Bangladesh Government Treasury Bonds (BGTBs) were held during July-December 2015. In all, 1427 bids for a total of TK. 48533.80 crore were received in the auctions of which 378 bids for a total of TK. 11999.19 crore were accepted and TK. 791.00 crore was devolved on Bangladesh Bank. Bonds worth of TK. 2400.03 crore were retired during the period under report and the outstanding balance of the bonds stood at TK. 242046.09 crore at the end of December, 2015. The weighted average annual yields of the accepted bids ranged between 4.19 to 10.35 percent. A brief description of the auctions of BGTB of different tenors is given in the Table-2.

Table-2

Bangladesh Government Treasury Bonds (BGTBs) Auctions: July-December 2015

(Crore Taka)

Tenors of Treasury Bonds	Bids offered		Bids accepted		Amount of Retired Bonds	Outstanding bonds as on December 2015	Range of W.A Yield of Accepted bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value			
1	2	3	4	5	6	7	8
2-year	291	10021.21	79	2750.00		19612.00	4.19-7.62
5-Year	332	10919.99	101	2540.23	2250.00	65990.00	5.04-8.56
10-Year	337	10609.94	97	3000.46	150.03	93237.19	6.55-9.75
15-Year	222	8024.18	44	1517.50		34282.50	7.83-10.03
20-Year	245	8958.48	57	1400.00		28924.40	8.20-10.35
Devolvement on Bangladesh Bank				791.00			
Total	1427	48533.80	378	11999.19	2400.03	242046.09	4.19-10.35@

Note: @ Overall range of treasury bonds of different maturities.
Source: Monetary Policy Department, Bangladesh Bank.

REPO Auctions

NO Repurchase Agreement (Repo) auction was held on during July-December 2015.

Reverse REPO Auctions

A total number of 126 auctions of Reverse Repo operation were held on daily basis during July-December 2015. In all, 2099 bids of 1-Day to 7-Day tenor amounting to TK. 1389243.50 crore (face value) were received in these auctions and 1880 bids were accepted. The interest rates of the accepted bids were 5.25 percent per annum. A brief description of Reverse Repo auctions is given in Table-3.

Reverse REPO Auctions: July-December 2015

(Crore Taka)

Total No. of auctions held during the period	Tenor	Bids received		Bids accepted		Interest rates of the accepted bids (%)
		No. of bids	Face value	No. of bids	Face value	
1	2	3	4	5	6	7
	1-2 Day	1649	1090381.50	1479	926358.52	5.25
126	3-7 Day	450	298862.00	401	248437.00	5.25
	Total	2099	1389243.50	1880	1174795.52	5.25

Source: Monetary Policy Department, Bangladesh Bank.

Auctions of Bangladesh Bank Bill

Forty six auctions of 30-Day Bangladesh Bank Bill (BB Bill) were held during July-December 2015. In all, 776 bids for a total of TK. 88017.50 crore (face value) were received in the auction of which 622 bids for a total of Tk.72660.50 crore were accepted. The outstanding balance of the bills stood at TK. 25723.90 crore at the end of December 2015. The weighted average yields of the accepted bids ranged between 2.67-5.25 percent. A brief description of BB Bills auctions is given in Table-4.

Table-4

30-Day Bangladesh Bank Bill: July-December 2015

(Crore Taka)

Bangladesh Bank Bill	Bids offered		Bids accepted		Outstanding bill as on December, 2015	Range of W.A. Yield of Accepted Bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value		
1	2	3	4	5	6	7
30-Day	776	88017.50	622	72660.50	25723.90	2.67-5.25

Source: Monetary Policy Department, Bangladesh Bank.

Government Revenue Receipts

The government revenue receipts stood at Taka 68083.30 crore during June-December 2015. During the period under report, the revenue receipts was 12.33 percent lower than the amount of Taka 77660.39 crore earned during January-June 2015 and 15.21 percent higher than the amount of Taka 59094.94 crore earned during July-December 2014. Receipts from the Value Added Tax (VAT) stood at Taka 26006.28 crore during July-December 2015, which was 3.66 percent lower than the receipts of Taka 26995.39 crore during January-June 2015 and 13.20 percent higher than the receipts of Taka 22973.63 crore during July-December 2014. The targeted total revenue receipts of the government is at Taka 176370.00 crore in FY16, which is 13.45 percent higher than that of Taka 135028.00 crore during FY15.

Agricultural Credit

Agricultural credit disbursed by the different banks/institutions stood at Tk. 8755.99 crore during July-December 2015 which was lower by 1.67 percent and higher by 23.78 percent than the disbursement of Tk. 8904.69 crore during January-June 2015 and of Tk.7073.77 crore during the same period of the preceding year respectively. The recovery of agricultural credit stood at Tk. 8421.35 crore during the period

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[1] National Board of Revenue's (NBR) portion

under review, which was higher by 11.89 percent and 6.86 percent than the recovery of Tk. 7526.27 crore during the preceding period and of Tk. 7880.69 crore during the same period of the preceding year respectively. The overdue of agricultural credit stood at Tk. 6210.41 crore at the end of December 2015 which was lower by 7.71 percent and 16.66 percent than the overdue amount of Tk. 6729.16 crore in June 2015 and of Tk. 7452.30 crore in December 2014 respectively.

Inflation Situation

General inflation (base: 2005-06=100) measured by twelve-month average Consumer Price Index (CPI) at the national level stood at 6.19 percent at the end of December 2015, which was 6.40 percent in June 2015 and 6.99 percent in December 2014. On the other hand, general inflation measured by point to point CPI at the national level was 6.10 percent in December 2015, which was 6.25 percent in June 2015 and 6.11 percent in the corresponding month of the preceding year.

Average food inflation at the national level stood at 6.05 percent in December 2015, which was 6.68 percent in June 2015 and 7.91 percent in December 2014. Food inflation measured by point to point basis at the national level was 5.48 percent in December 2015, which was 6.32 percent in June 2015 and 5.86 percent in December 2014.

Average non-food inflation at the national level stood at 6.41 percent at the end of December 2015, which was 5.99 percent in June 2015 and 5.60 percent in December 2014. Non-food inflation measured by point to point basis at the national level was 7.05 percent in December 2015, which was 6.15 percent in June 2015 and 6.48 percent in the corresponding month of the preceding year.

Food Situation

The target for domestic production of foodgrains during FY15-16 has been set at 364.24 lakh metric tons which was 1.02 percent higher than 360.58 lakh metric tons produced during FY14-15.

In FY15-16 the target for import (government + private) of foodgrains in the country has been set at 39.50 lakh metric tons which was significantly higher by 15.84 percent than 34.10 lakh metric tons during FY14-15. Import of foodgrains during July-December 2015 stood at 21.61 lakh metric tons against 12.63 lakh metric tons imported during the preceding six months and 21.47 lakh metric tons during the same period of last year.

In FY15-16, government distribution of foodgrains has been targetted at 27.80 lakh metric tons, which was 1.46 percent higher as compared to the distribution of 27.40 lakh metric tons during FY14-15. Distribution of foodgrains during July-December 2015 stood at 6.13 lakh metric tons against the distribution of 20.14 lakh metric tons during the preceding six months and 7.26 lakh metric tons during the same period of last year.

The target for stock of foodgrains during FY15-16 has been set at 12.96 lakh metric tons, which was only 0.78 percent higher compared to the stock of 12.86 lakh metric tons during FY14-15. Stock of foodgrains during July-December 2015 stood at 15.34 lakh metric tons against the stock of 3.01 lakh metric tons during the preceding six months and 13.39 lakh metric tons during the same period of last year.

Stock Exchange Activities

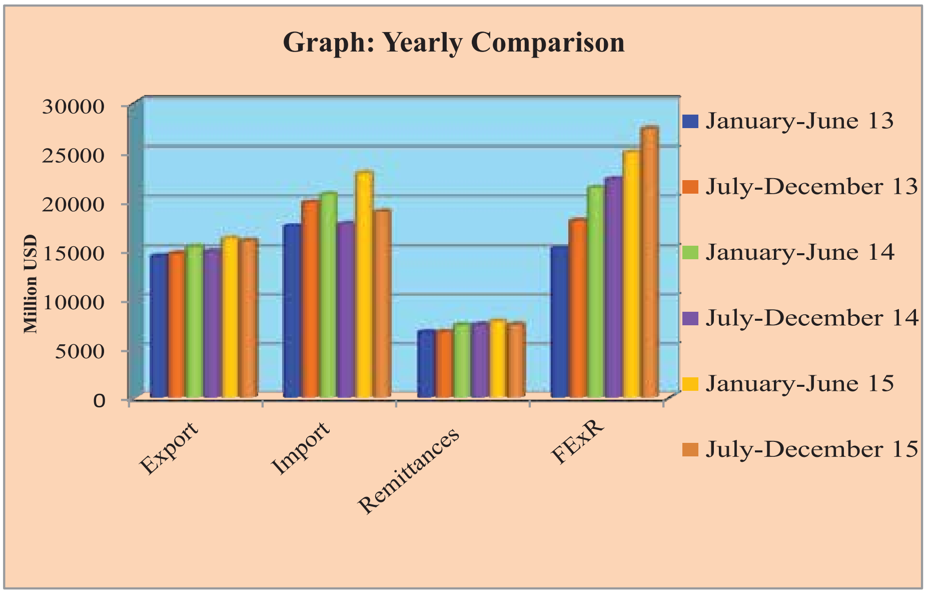
In the Dhaka Stock Exchange Ltd. (DSE), the total number of listed securities stood at 559 including 221 Government Treasury Bonds at the end of December 2015. During the period June-December 2015, a total of 143569.4 lakh shares and debentures worth Taka 55471.77 crore were traded as against 117491.2 lakh shares and debentures worth Taka 47668.09 crore during January-June 2015. It was 22.20 percent higher in volume and 16.37 percent higher in value than that of the preceding period. The market capitalization of DSE stood at Taka 315976 crore at the end of the period under report, which was 2.70 percent lower than Taka 324731 crore at the end of the preceding period. The All Share Price Index of DSE stood at 4629.64 points at the end of December 2015, which was 1.02 percent higher than 4583.11 points at the end of June 2014.

In the Chittagong Stock Exchange Ltd. (CSE), the total number of listed securities stood at 299 at the end of December 2015. During the period July-December 2015, a total of 123.4 crore shares and debentures worth Taka 4233.96 crore were traded as against 134.30 core shares and debentures worth Taka 4613.14 crore during the preceding six months. It was 8.12 percent lower in volume and 8.22 percent lower in value than that of the preceding period. The market capitalization of CSE stood at Taka 249348.6 crore at the end of the period under report, which was 3.87 percent lower than that of Taka 259377.7 crore at the end of the preceding period. The All Share Price Index of CSE stood at 14089.63 points at the end of December 2015, which was 0.53 percent lower than that of 14097.17 points at the end of June 2014.

Exports, Imports, Remittances and Foreign Exchange Reserves

The key components of external sector of a country are Export, Import, Remittance and Foreign Exchange Reserve. The changes in these components of external sector of Bangladesh for the period of July-December 2015 are discussed below:

Export earnings stood at US$ 16083.9 million during July-December 2015 which decreased by 1.3 percent compared to US$ 16294.7 million in preceding period and increased by 7.8 percent compared to the same period of the previous year. The yearly trend of export changed due mainly to increase of export of engineering products, agricultural products, chemical products, leather & leather products, jute & jute goods and some other goods, etc.



In July-December 2015 Import payments decreased by 17.2 percent to US$ 18991.0 million during the period under report compared to US$ 22930.0 million in previous period and 7.0 percent higher than the same period of the preceding year. The half yearly decrease in import payments was partially caused by iron and steel, Plastic and articles thereof, mineral fuel, mineral oils and product of their distillation, bituminous substances etc. Decreased demand of import for EPZ also lessens the import of the country.

Remittance earnings of the country stood at US$ 7487.2 million during July-December 2015 which was decreased by 4.4 percent compared to the previous period and almost same as July-December 2014. Decreased remittance from KSA, UAE, Kuwait and Malaysia and other countries mainly cause for decrease the remittance inflow to the country during the period.

In July-December 2015 Foreign Exchange Reserve of the country increased by 9.9 percent and 23.2 percent respectively to US$ 27493.3 million compared to the previous period and the same period of the preceding year. The yearly upward trend in the country's Foreign exchange reserve was due mainly to decrease in import payments during the period of FY15 compared to same period of FY14.

Table-1

(In Million USD)

Period	Export	Import	Remittances	FExR
January-June 2013	14427.6	17526.9	6735.9	15315.2
July-December 2013	14685.8	19932.0	6772.8	18094.6
January-June 2014	15491.0	20800.0	7455.2	21467.1
July-December 2014	14914.2	17755.0	7487.2	22309.8
January-June 2015	16294.7	22930.0	7829.8	25025.2
July-December 2015	16083.9	18991.0	7487.2	27493.3

Sources: Statistics Department and Foreign Exchange Policy Department of Bangladesh Bank.

Table -2

Period	Half yearly % Change				Yearly % change			
	Export	Import	Remittances	FExR	Export	Import	Remittances	FExR
January-June 2013	14.5	6.6	-9.0	20.1	15.3	-1.1	-0.6	47.8
July-December 2013	1.8	13.7	0.5	18.1	16.6	21.2	-8.5	41.9
January-June 2014	5.5	4.4	10.1	18.6	7.4	18.7	10.7	40.2
July-December 2014	-3.7	-14.6	0.4	3.9	1.6	-10.9	10.5	23.3
January-June 2015	9.3	29.1	4.6	12.2	5.2	10.2	5.0	16.6
July-December 2015	-1.3	-17.2	-4.4	9.9	7.8	7.0	0.0	23.2

ANNEXURE-I
Monetary and Credit Policy Measures During July-December 2015

BRPD Circular No. 08 02 August 2015 Loan Classification and Provisioning	For the purpose of meticulous compliance with the Banking Companies Act, 1991 (amended up to 2013) along with the view to strengthening banking supervision, few changes have been brought in the CL formats. Revised formats are attached with this circular. The Enterprise Data Warehouse (EDW) template (T_PS_Q_LN_PROV) for loan classification and provisioning has been changed and uploaded on the Bangladesh Bank website accordingly. Banks are advised to report according to the amended CL formats along with the changed EDW template from September, 2015 quarter. All other instructions of the above circulars will remain unchanged.
FSD Circular Letter No. 01 27 August 2015 Updated User Manual and Input Template for 'Financial Projection Model'	The input template and the user manual for the 'Financial Projection Model (FPM)' have been updated in accordance with the "Guidelines on Risk Based Capital Adequacy- Revised Regulatory Capital Framework for banks in line with Basel III". In this regard, all the scheduled banks are advised to collect the soft copies of the updated input template and user manual from Financial Stability Department within the period of September 06, 2015 to September 10, 2015. All scheduled banks are instructed to submit appropriately filled in one (01) input template for the quarters from June 2012 to June 2015 (13 quarters) on or before October 15, 2015 to Financial Stability Department. All other instructions provided in FSD Circular No. 01 dated March 03, 2014 will remain unchanged.
FE Circular Letter No. 20 08 September 2015 Release of foreign exchange against cost of advertisement for Bangladeshi products in foreign electronic/ online media	Referring to paragraph 33, chapter 10 of Guidelines for Foreign Exchange Transactions (GFET)-2009, Vol-1, it has been clarified that Authorized Dealers (ADs) may effect remittance towards cost of advertisement of Bangladeshi products in foreign electronic and online media in dynamic, image, video, interactive and/or other formats, after satisfying themselves with the genuineness and bonafides of the requests through agreement and invoices and after deducting all applicable taxes.

PSD Circular No. 09 09 September 2015 Bangladesh Real Time Gross Settlement (BD-RTGS) System Rules	The purpose of this document is to define the System Rules for Bangladesh Real Time Gross Settlement (BD-RTGS) System. These Rules define operational aspects of BD-RTGS, together with the duties and obligations of all Participants including Bangladesh Bank (BB) in its role as both System Operator and as a Participant. These rules shall be applicable to all participants that are authorized by BB and have signed their agreement hereto.
DOS Circular Letter No. 13 09 September 2015 Strengthening and updating the Risk Management System in banks	Practicing sound risk management is crucial for banking sector. Necessary instructions have been issued from time to time through circulars, guidelines and letters with a view to ensuring proper application of sound risk management in banks; i.e., for building the necessary infrastructure and taking various steps for identification, measurement, monitoring, and control or mitigation of various existing and potential risks; and maintaining adequate capital and provision to support risk-taking. To bring greater expertise and harmonization to risk management activities of all banks and exercise international best practices, a format named 'Comprehensive Risk Management Report (CRMR)' for assessing risks (annex-ka & kha), an organogram for a separate risk management division (annex-ga), and a structure of risk management committee at management level (annex-gha) have been prepared to be followed at a minimum in addition to the previously issued circulars. For stronger and timely/updated risk management activities, banks are asked to follow the instructions mentioned in this circular.
FEPD Circular No. 11 13 September 2015 Foreign Exchange Regulation (Amendment) Act, 2015	Foreign Exchange Regulation (Amendment) Act, 2015 updating Foreign Exchange Regulation Act, 1947 (Act No. VII of 1947) on regulating the purchase and selling of foreign currencies and securities has been issued through additional issue of Bangladesh Gadget. All authorized dealer banks and money changers are instructed to follow the rules and regulations mentioned in this act.

BRPD Circular No. 09 17 September 2015 Guideline on ICT Security for Banks and Non-Bank Financial Institutions	Some amendments have been brought into the Guideline on ICT Security for Banks and Non-Bank Financial Institutions. All scheduled banks have been instructed to comply with the above mentioned revised guideline which has been uploaded to BB website.
FE Circular No. 13 21 September 2015 Inward Remittance – Declaration on Form C	Attention of the Authorized Dealers (ADs) has been invited to the paragraph 10, chapter 5 of the Guidelines for Foreign Exchange Transactions (GFET)-2009, Vol-1 and FE Circular No. 07, dated July 22, 2012 in terms of which declaration on Form C is required against inward remittances (other than remittances sent by Bangladesh nationals working abroad). It has now been decided that declaration on Form C shall not be required for inward remittance up to US$ 10, 000 or equivalent other foreign currencies. Other instructions contained in the above stated paragraph of GFET-2009 shall remain unchanged.
FE Circular No. 14 28 September 2015 Deposit in foreign currency to blocked accounts abroad for visa/admission processing against study purpose	Attention of the Authorized Dealers (ADs) has been invited to paragraph 10, chapter 11 of Guidelines for Foreign Exchange Transactions-2009 (GFET), Vol-1 read with paragraph 2 of FE Circular No. 10, dated August 03, 2009 in terms of which Authorized Dealers (ADs) are allowed to release foreign exchange for admission and study abroad by Bangladesh nationals in permissible courses. It has been observed that as a requirement of visa/admission processing in some cases, students intending to study abroad are required to deposit foreign currency to be blocked in designated bank accounts or student accounts abroad opened in accordance with the guidance of foreign educational institutes/embassies/high commissions. To facilitate study abroad by Bangladeshi students in permissible courses, it has been decided to allow students to open such blocked accounts abroad to which necessary funds as set by foreign institutes/competent authority in foreign currency may be released. In this case, ADs shall, while releasing foreign currency, observe the instructions mentioned in this circular.

CIB Circular No. 02/2015 30 September 2015 Regarding Commencement of Live Operation of New CIB Online Solution developed by its own resources	BB has introduced Live Operation of New CIB Online Solution for all scheduled banks and financial institutions from its own resources. This solution has already been implemented from 01 October 2015. All scheduled banks and financial institutions are instructed to follow the new solution as per the directions mentioned in this circular.
FE Circular No. 16 04 October, 2015 Remittances on Account of Visa Processing Fees through ICC/Virtual Card	All authorized dealer (AD) banks have been instructed that online payment of visa processing fees through International Credit Card (ICC) as per requirement of concerned Embassies/High commissions may be effected within the purview of paragraph 9, chapter 11 of Guidelines for Foreign Exchange Transactions (GFET), Vol-1. ICC issuing banks may also issue Virtual Cards for individuals not holding ICCs to facilitate the online payment of visa processing fees.
PSD Circular No. 10/2015 04 October, 2015 Revised Implementation Timeline for BD-RTGS System	It has been observed that a critical system like Real Time Gross Settlement (RTGS) needs multiple phases of testing, all of which have not been completed yet. Only few banks have completed the process, while others are in progress. Therefore, BB has extended the System Integration Testing (SIT) completion timeline from October 1 to October 15, accordingly the Go Live date has been revised at October 29, 2015. All schedule banks are therefore requested to take necessary steps to prepare themselves for the live operation of BD-RTGS
BRPD Circular Letter No. 10 04 October, 2015 Amendment of Bank-Company Act, 1991	As per the regulation of section 60 of Financial Reporting Act, 2015, two new sub-sections have been added to section-38 of Bank-Company Act, 1991. All scheduled banks are instructed to comply with the amended sub-sections of Bank-Company Act, 1991

DFIM Circular No. : 10 20 October, 2015 Providing Revolving Loans by Financial Institutions (FIs)	It has been observed from the analysis of loan statements of FIs submitted to Bangladesh Bank that, some FIs are providing revolving loans for one year with condition of interest repayment on monthly basis and the principal amount at the end of the tenure. As per the loan contracts, these kinds of loans are renewable after the end of the tenure. It has been identified by recent on-site and off-site supervision of Bangladesh Bank that FIs renew this type of loans by showing them regular despite of the clients' failure to adjust the outstanding amount at the end of the tenure. Moreover, being failure to recover these loans at the end of the tenure, some FIs have been renewing these loan accounts for the next tenure by considering the outstanding amount as new loan limit. Though these loans are classifiable under qualitative judgment, FIs are showing these as regular. Thus it has been generating credit risk in one hand and hampering transparency and accountability of the institution on the other hand. Besides these, the true picture of loan classification status is not being reflected in the financial statements. As a whole, the FIs are falling in greater risks gradually due to the lack of transparency in loan approval and renewal process. In order to ensure the factual reflection of the classified loans and to reduce the risk of nonpayment, it has been decided that, FIs will not renew any revolving loan account without adjusting its overdue amount.
DFIM Circular Letter no.06 20 October, 2015 Amendment of Section 23 of Financial Institutions Act, 1993	Financial Reporting Act, 2015 has been compiled in order to bring the reporting activities of "Public Interest Institutions" under well governed structure, formulate standards for accounting and auditing, and ensure proper compliance, implementation, monitoring and other activities related to these. This Act was published in Bangladesh Gazette (supplementary) on September 09, 2015 which has been enacted from the same date. A new section titled as '23ka' has been included in Financial Institutions Act, 1993 (Act no. 27 of 1993) by dint of section 61 of Financial Reporting Act, 2015. All financial institutes are instructed to comply with this new amendment.

DFIM Circular No. 09 20 October, 2015 Regarding Submission of Liquidity Profile and Statement of Affairs	"Managing Core Risks in Financial Institutions: Asset Liability Management" issued by Bangladesh Bank dated July 14, 2005 provides standard guidelines and tools to the management for assessing and monitoring the liquidity position of a financial institution (FI). The guidelines also contains adequate instructions regarding measuring and managing the net funding requirement. Hence, all financial institutes are instructed to submit Statement of Liquidity Profile and Statement of Affairs as per the instructions of this circular.
FE Circular No. 18 27 October, 2015 Long Term Financing Facility (LTFF) under the Financial Sector Support Project (FSSP	The Government of Bangladesh (GoB) has signed a Financing Agreement (FA) on June 30, 2015 with the International Development Association (IDA) regarding implementation of the Financial Sector Support Project (FSSP). The objective of the project is to improve financial market infrastructure of the country, regulatory and oversight capacity of Bangladesh Bank and access to long term financing mainly for manufacturing firms in Bangladesh. Bangladesh Bank has also signed a Project Agreement (PA) with the IDA on the same date to carry out the tasks for implementation of the project. 02. "Supporting Long Term Finance" is the major component of the project. Under the arrangement, Bangladesh Bank will provide long term financing in foreign currency mainly for small and medium scale manufacturing enterprises in the country as detailed in the attached Operations Manual. The financing would be provided to eligible Participating Financial Institutions (PFIs) for on lending/refinancing to the eligible firms. 03. The Operations Manual governing the operation and implementation procedures of the fund and eligibility criteria of the financial institutions is attached herewith. 04. Interested banks may apply to the Project Director (PD) of Financial Sector Support Project (FSSP) for participating in the Financing Facility.

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A SURVEY OF ECONOMIC SITUATION IN BANGLADESH: January-June 2016

The major macroeconomic indicators including real, external and financial sectors recorded moderate growth during the second half of FY16. During January-June 2016 moderate growth in broad money helped to keep inflation lower and foreign exchange reserve increased due mainly to increase in export and remittances. Annual average inflation went down to 5.92 percent at the end of June 2016 which was 6.19 percent in December 2015 and 6.40 percent in June 2015. Export earnings stood at US$ 18173.3 million during January-June 2016 which increased by 13.0 percent compared to US$ 16083.9 million in preceding period due to mainly increase of export of wood & wood products, agricultural products, handicrafts, man-made filaments & staple fibres, paper & paper products, leather & leather products, jute & jute goods, furniture, etc. On the other hand, Import payments increased by 3.3 percent to US$ 20371.8 million during the period under report compared to US$ 18991.0 million in previous period.

Monetary and Credit Situation

Narrow Money (M1)

Narrow money recorded an increase of BDT 44111.40 crore or 26.21 percent to BDT 212430.70 crore during January-June 2016 as compared to the increase of 4.67 percent during July-December 2015 and the increase of 8.63 percent during January-June 2015.

Broad Money (M2)

Broad money recorded an increase of BDT 78263.70 crore or 9.34 percent to BDT 916377.90 crore during January-June 2016 as compared to the increase of 6.41 percent during July-December 2015 and the rise of 6.26 percent during the corresponding period of the preceding year. From the analysis of component of broad money it can be said that broad money increased during January-June 2016 due to increase in demand deposits, time deposits and currency outside banks. Demand deposits increased by BDT 14582.20 crore or 19.24 percent and time deposits increased by BDT 34152.30 crore or 5.10 percent during January-June 2016. Currency outside banks also recorded an increase of BDT 29529.20 crore or 31.91 percent during the reported period.

An analysis of the causative factors of the change in money supply revealed that net foreign assets increased by BDT 23818.20 crore or 11.38 percent, while net domestic assets of the banking system increased by BDT 54445.50 crore or 8.66 percent during the period under review. The increase in net foreign assets is the major factor of net expansionary impact of broad money during the reported period.

Domestic Credit

Total domestic credit recorded an increase of BDT 60635.50 crore or 8.19 percent to BDT 801279.90 crore during January-June 2016 as compared to the increase of 5.58 percent during July-December 2015 and a rise of 4.13 percent during the corresponding period of the previous year. The rise in domestic credit during the period under report can be attributed to the increase in both net credit to government sector as well as credit to private sector, which were increased by 10.37 percent and 8.14 percent respectively during the reported period.

Reserve Money

Reserve money recorded an increase of BDT 32986.50 crore or 20.59 percent to BDT 193201.30 crore during January-June 2016 as compared to the increase of 7.90 percent during July-December 2015 and the increase of 6.71 percent during the corresponding period of the previous year.

Auctions of Government Treasury Bills

Twenty-six (26) weekly auctions of each of the 91-Day, 182-Day and 364-Day Government Treasury Bills (TBs) were held during January-June 2016. In all, 1461 bids for a total of BDT 84607.58 crore (face value) were offered in the auctions of which 461 bids for a total of BDT 28925.90 crore (face value) were accepted. Bills worth of BDT 28183.00 crore were retired during the period under report and the outstanding balance of the bills stood at BDT 54482.00 crore at the end of June 2016. A brief summary of the auctions of Govt. TBs of different tenors is given in the Table-1.

Table-1
Auctions of Government Treasury Bills: January-June 2016

(BDT in Crore)

Tenors of Treasury Bills	Bids offered		Bids accepted		Amount of retired bills	Outstanding balance of bills as on June, 2016	Range of W.A. Yield of accepted bids(%)
	No. of bids	Face value	No. of bids	Face value			
1	2	3	4	5	6	7	8
91-Day	793	49762.67	210	16047.00	12400.00	16627.00	2.43-4.22
182-Day	350	21474.07	114	7734.70	8500.00	12205.00	4.10-4.86
364-Day	318	13370.84	137	5144.20	7283.00	25650.00	4.35-5.23
Devolvement on Primary Dealers and non Primary Dealer Banks				0			
Total	**1461**	**84607.58**	**461**	**28925.90**	**28183.00**	**54482.00**	2.43-5.23@

@ Overall range of the yield of treasury bills of different maturities.
Source: Monetary Policy Department, Bangladesh Bank.

Auctions of Bangladesh Government Treasury Bonds (BGTBs)

Twenty four (24) weekly auctions of Bangladesh Government Treasury Bonds (BGTBs) were held during January-June 2016. In all, 943 bids for a total of BDT 29192.96 crore were offered in the auctions of which 288 bids for a total of BDT 12100.00 crore were accepted of which 2166.58 crore were devolved on Bangladesh Bank. Bonds worth of BDT 6296.63 crore were retired during the period under report and the outstanding balance of the bonds stood at BDT 249137.03 crore at the end of June, 2016. The weighted average yields of the accepted bids were ranged between 4.79 to 8.55 percent. A brief description of BGTB auctions of different tenors is given in the following Table-2

Table-2

Bangladesh Government Treasury Bonds (BGTBs) Auctions: January-June 2016

(BDT in crore)

Tenors of Treasury Bills	Bids offered		Bids accepted		Amount of Retired Bonds	Outstanding balance of bonds as on June 2016	Range of W.A Yield of Accepted bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value			
1	2	3	4	5	6	7	8
2-year	207	7091.88	62	2334.18	2700.00	18812.00	4.79-5.97
5-Year	197	6818.23	66	2715.94	3000.00	65440.00	5.89-6.51
10-Year	204	6034.35	66	2120.80	596.63	96478.13	5.95-7.38
15-Year	148	4095.20	33	1193.80	0.00	36882.50	7.18-7.97
20-Year	187	5153.30	61	1568.70	0.00	31524.40	7.58-8.55
Devolvement on Bangladesh Bank				2166.58			
Total	**943**	**29192.96**	**288**	**12100.00**	**6296.63**	**249137.03**	**4.79-8.55@**

Source: Monetary Policy Department, Bangladesh Bank.
@ Overall range of treasury bonds of different maturities.

REPO Auctions

A total number of three (03) auctions of REPO (Liquidity Support Facility & Special Repo) operations were held on daily basis during the period January-June 2016. In all, 10 bids of 1-Day to 2-Day and 3-Day to 7-Day tenor amounting total of BDT 1329.90 crore were received in these auctions, of which all the bids were accepted for a total of BDT 1305.12 crore. The interest rate of the accepted bids was ranged between 7.25 to 10.25 percent per annum during the period under report. A brief summary of the auctions of REPO of different tenors is given in the Table-3.

Table-3

REPO Auctions: January-June 2016

(BDT in crore)

Total No. of auctions held during the period	Tenor	Bids received		Bids accepted		Interest rates of the accepted bids (%)
		No. of bids	Face value	No. of bids	Face value	
1	2	3	4	5	6	7
3	1-2 Day	9	481.90	9	457.12	7.25-10.25
	3-7 Day	1	848.00	1	848.00	9.75
	Total	**10**	**1329.90**	**10**	**1305.12**	**7.25-10.25**

Source: Monetary Policy Department, Bangladesh Bank.

Reverse REPO Auctions

A total number of eighty nine (89) auctions of Reverse REPO operations were held on daily basis during January-June 2016. In all, 170 bids of 1- 2 Day and 3- 7 Day tenors amounting total of BDT 64605.00 crore were received and no bids were accepted in these auctions during the period under report. A brief description of Reverse REPO auctions of different tenors is given in Table-4.

Table-4
Reverse REPO Auctions: January-June 2016

(BDT in crore)

Total No. of auctions held during the period	Tenor	Bids received		Bids accepted		Interest rates of the accepted bids (%)
		No. of bids	Face value	No. of bids	Face value	
1	2	3	4	5	6	7
89	1-2 Day	148	57907.00	0.00	0.00	0.00
	3-7 Day	22.00	6698.00	0.00	0.00	0.00
	Total	**170**	**64605.00**	**0.00**	**0.00**	**0**

Source: Monetary Policy Department, Bangladesh Bank.

Auctions of Bangladesh Bank Bills

Ninety two (92) auctions of 30-Day Bangladesh Bank Bills (BB Bill) were held during January-June 2016. In all, 787 bids for a total of BDT 124690.40 crore were offered in the auctions of which 715 bids for a total of BDT 112542.40 crore were accepted. The outstanding balance of the bill stood at BDT 42810.90 crore at the end of June, 2016. The weighted average yield of the accepted bids was ranged between 2.60-3.20 percent. A brief description of BB Bill auctions is given in Table-5.

Table-5
30-Day Bangladesh Bank bills: January-June 2016

(BDT in crore)

Bangladesh Bank Bills	Bids offered		Bids accepted		Outstanding Balance of bills as on June, 2016	Range of W.A. Yield of accepted bids(%)
	No. of bids	Face value	No. of bids	Face value		
1	2	3	4	5	6	7
30-Day	787	124690.40	715	112542.40	42810.90	2.60-3.20

Source: Monetary Policy Department, Bangladesh Bank.

Government Revenue Receipts

The total (NBR+Non-NBR+Non-tax) revenue collection target for FY16 is BDT 2,08,443.0 crore which is 13.93 percent greater than that of FY15. The government revenue receipts stood at BDT 99,809.4 crore during January-June 2016 which was 47.9 percent of the FY16 revenue collection target of BDT 2,08,443.0 crore. That revenue receipt during the period under report was 24.1 percent higher than the amount of BDT 80,405.3 crore earned during July-December 2015 as well as 28.5 percent higher than BDT 77,660.4 crore earned during January-June 2015.

In FY16, total revenue collection stood at BDT 180214.72 crore which was 86.46 percent of the annual target when the revenue collection of the same period of previous fiscal year was BDT 157688.29 crore which was 86.19 percent of its annual target.

Agricultural Credit

Agricultural credit disbursed by the all banks stood at BDT 8890.40 crore during January-June 2016, which was 1.54 percent higher than that of BDT 8755.99 crore during July-December 2015. During January-June 2015, disbursement of agricultural credit stood at BDT 8904.69 crore, which was 0.16 percent lower than that of the reporting period. The recovery of agricultural credit stood at BDT 8635.08 crore during January-June 2016, which was 2.54 percent higher than that of BDT 8421.35 crore during July-December 2015. During January-June 2015, recovery of agricultural credit stood at BDT 7526.27 crore, which was 14.73 percent higher than that of the reporting period. The outstanding of agricultural credit stood at BDT 34477.37 crore at the end of June 2016, which was higher by 5.96 percent than the amount of BDT 32536.81 crore at the end of December 2015.The overdue of agricultural credit stood at BDT 5678.32 crore at the end of June 2016, which was 8.56 percent lower than that of BDT 6210.41 crore at the end of December 2015. At the end of June 2015, overdue of agricultural credit stood at BDT 6210.41 crore, which was 15.62 percent lower than that of the end of June 2016.

Inflation Situation

General inflation (base: 2005-06=100) measured by twelve-month average Consumer Price Index (CPI) at the national level stood at 5.92 percent at the end of June 2016, which was 6.19 percent in December 2015 and 6.40 percent in June 2015. On the other hand, general inflation measured by point to point CPI at the national level was 5.53 percent in June 2016, which was 6.10 percent in December 2015 and 6.25 percent in the corresponding month of the preceding year.

Average food inflation at the national level stood at 4.90 percent in June 2016, which was 6.05 percent in December 2015 and 6.68 percent in June 2015. Food inflation measured by point to point basis at the national level was 4.23 percent in June 2016, which was 5.48 percent in December 2015 and 6.32 percent in June 2015.

Average non-food inflation at the national level stood at 7.47 percent at the end of June 2016, which was 6.41 percent in December 2015 and 5.99 percent in June 2015. Non-food inflation measured by point to point basis at the national level was 7.50 percent in June 2016, which was 7.05 percent in December 2015 and 6.15 percent in the corresponding month of the preceding year.

Food Situation

The target for domestic production of food grains during FY15-16 was set at 364.24 lac metric tons, which was 1.02 percent higher than 360.58 lac metric tons produced during FY14-15.

For FY15-16, the target for import (government & private) of food grains in the country was set at 39.50 lac metric tons, which was lower by 25.10 percent than 52.74 lac metric tons imported during FY14-15. Import of food grains during January-June 2016 stood at 23.79 lac metric tons against 21.61 lac metric tons imported during July-December 2015 and 30.79 lac metric tons during January-June 2015.

The target for domestic procurement of food grains during FY15-16 was fixed at 17.00 lac metric tons, which was 1.43 percent higher than the procurement of 16.76 lac metric tons during FY14-15. Procurement of food grains during January-June 2016 stood at 1.60 lac metric tons against the procurement of 10.72 lac metric tons during July-December 2015 and 8.23 lac metric tons during January-June 2015.

For FY15-16, government distribution of food grains was targeted at 27.80 lac metric tons, which was 51.25 percent higher as compared to the distribution of 18.38 lac metric tons during FY14-15. Distribution of food grains during January-June 2016 stood at 14.51 lac metric tons against the distribution of 6.13 lac metric tons during July-December 2015 and the distribution of 11.12 lac metric tons during January-June 2015.

The target for food grains stock during FY15-16 was set at 12.96 lac metric tons, which was 0.78 percent higher compared to the stock of 12.86 lac metric tons at the end of FY14-15. Food grains Stock at the end of June 2016 stood at 8.56 lac metric tons against the stock of 15.34 lac metric tons at the end of December 2015 and the stock of 12.86 lac metric tons at the end of June 2015.

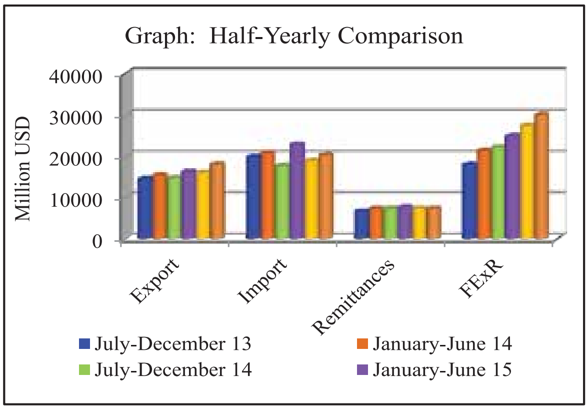
Stock Exchange Activities

In the Dhaka Stock Exchange Ltd. (DSE), the total number of listed securities stood at 559 including 221 Government Treasury Bonds at the end of June 2016. During the period January-June 2016, a total of 14601.5 million shares and debentures worth BDT 51774.3 crore were traded as against 14356.9 million shares and debentures worth BDT 55471.8 crore during July-December 2015. It was 1.7 percent higher in volume but 6.7 percent lower in value than that of the preceding period. The market capitalization of DSE stood at BDT 3,185,74.9 crore at the end of the period under report, which was 0.8 percent higher than BDT 3,159,75.7 crore at the end of the preceding period. The All Share Price Index of DSE stood at 4,507.6 points at the end of June 2016, which was 2.6 percent lower than 4,629.6 points at the end of December 2015.

In the Chittagong Stock Exchange Ltd. (CSE), the total number of listed securities stood at 298 at the end of June 2016. During the period January-June 2016, a total of 1255.3 million shares and debentures worth BDT 3571.6 crore were traded as against 1232.7 million shares and debentures worth BDT 4234.1 crore during the preceding six months. It was 1.8 percent higher in volume but 15.7 percent lower in value than that of the preceding period. The market capitalization of CSE stood at BDT 249684.9 crore at the end of the period under report, which was 0.4 percent higher than that of BDT 248749.3 crore at the end of the preceding period. The All Share Price Index of CSE stood at 13,802.6 points at the end of June 2016, which was 2.0 percent lower than that of 14089.6 points at the end of December 2015.

Exports, Imports, Remittances and Foreign Exchange Reserves

The key components of external sector of a country are Export, Import, Remittance and Foreign Exchange Reserve. The changes in these components of external sector of Bangladesh for the period of ***January-June 2016*** are discussed below:



Graph: Half-Yearly Comparison

Export earnings stood at US$ **18173.3** million during **January-June 2016** which ncreased by 13.0 percent compared to US$ 16083.9 million in preceding period and increased by 11.5 percent compared to the same period of the previous year. The half yearly trend of export changed due mainly to increase of export of wood & wood products, agricultural products, handicrafts, man-made filaments & staple fibres, paper & paper products, leather & leather products, jute & jute goods, furniture, etc. In ***January-June 2016 Import*** payments increased by 3.3 percent to US$ **20371.8** million during the period under report compared to US$ 18991.0 million in previous period and 11.2 percent lower than the same period of the preceding year. The yearly increase in import payments was partially caused by Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes, Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork., Pulp of wood or of other fibrous cellulosic material; waste and scrap of paper or paperboard;

paper or paperboard and articles thereof, Textiles and textile articles, Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair etc.

Remittance earnings of the country stood at US$ 7444.0 million during ***January-June 2016*** which was decreased slightly by 0.6 percent and 4.9 percent respectively compared to the previous period and the same period of preceding year. Decreased remittance from Bahrain, KSA, UAE, Oman, Kuwait, Malaysia, Singapore and USA mainly contributed to increase the remittance inflow to the country during the period.

In ***January-June 2016 Foreign Exchange Reserve*** of the country increased by 9.7 percent and 20.6 percent respectively to US$ 30168.2 million compared to the previous period and the same period of the preceding year. The half-yearly data of the country's Foreign exchange reserve, Export, Import and Remittances are shown in the Table-1 and half-yearly growth (%) and yearly growth (%) are shown in the Table-2.

Table-1

(In Million USD)

Period	Export	Import	Remittances	FExR
January-June 2013	14427.6	17526.9	6735.9	15315.2
July-December 2013	14685.8	19932.0	6772.8	18094.6
January-June 2014	15491.0	20800.0	7455.2	21467.1
July-December 2014	14914.2	17755.0	7487.2	22309.8
January-June 2015	16294.7	22930.0	7829.8	25025.2
July-December 2015	**16083.9**	**18991.0**	**7487.2**	**27493.3**
January-June 2016	**18173.3**	**20371.8**	**7444.0**	**30168.2**

Sources: Statistics Department, Bangladesh Bank.
Bangladesh Bank website.

Table-2

Period	Half yearly % Change				Yearly % change			
	Export	Import	Remittances	FExR	Export	Import	Remittances	FExR
January-June 2013	14.5	6.6	-9.0	20.1	15.3	-1.1	-0.6	47.8
July-December 2013	1.8	13.7	0.5	18.1	16.6	21.2	-8.5	41.9
January-June 2014	5.5	4.4	10.1	18.6	7.4	18.7	10.7	40.2
July-December 2014	-3.7	-14.6	0.4	3.9	1.6	-10.9	10.5	23.3
January-June 2015	9.3	29.1	4.6	12.2	5.2	10.2	5.0	16.6
July-December 2015	**-1.3**	**-17.2**	**-4.4**	**9.9**	**7.8**	**7.0**	**0.0**	**23.2**
January-June 2016	**13.0**	**3.3**	**-0.6**	**9.7**	**11.5**	**3.2**	**-4.9**	**20.6**

Chronology of Major Policy Announcements: January-June, 2016

Policy Announcements on Banking and Financial Sector Development: January-June, 2016

January 2016

- Considering potential for buffalo rearing in char and hoar areas due to conventional environment and custom, BB has instructed all scheduled banks to undertake necessary measures to distribute more agricultural credit among farmers/firms for buffalo rearing in different areas of the country including char and hoar areas.

January 2016

- To make the guidelines on stress testing for financial institutions more effective and up-to-date, the guidelines have been revised as follows:

a) The standard scenarios of shock levels will remain the same i.e. default of top 3 (as minor shock), top 5 (as moderate shock) and top 10 (as major shock). But instead of assuming 100 percent of the loans/leases disbursed to top borrowers as defaulted (as shocks), only 80 percent of those loans/leases will be assumed as defaulted in different shocks.

b) Government Guarantees and Hypothecation including collateral agreement of Financial Institutions operating loans/leases activities to specialized sectors will be considered as eligible securities in case to case basis.

c) Weighted Insolvency Ratio (WIR) ratings have been amended as follows:

Existing Scenario Total	Revised Scenario Total	Rating	Zone
WIR<10%	WIR<15%	1	Green
10%≤WIR<20%	15%≤WIR<25%	2	Yellow
20%≤WIR<40%	25%≤WIR<45%	3	
40%≤WIR<60%	45%≤WIR<60%	4	Red
WIR≥60%	WIR≥60%	5	

January 2016

- An amendment has been made regarding refinance scheme worth BDT 200 crore for BDT 10 account holders to bring dynamism in the of disbursement and recovery process. All schedule banks have been instructed to comply with the following procedures:

	a) Banks may determine one or more installments in its sole discretion to recover entire loan in case of loan disbursed directly to the consumer level for sectors stated in the agricultural credit policies. b) Under the scheme, CIB report will not be required in case of single borrower up to BDT 50000. However, banks will have to ensure not to provide any credit facilities in favor of the defaulted borrowers.
January 2016	• Integrated risk management guidelines for financial institutions have been prepared to adopt with improved policies and procedures in line with international best practices. The guidelines encompass all the probable risks associated with financing companies. The policies and procedures of the integrated risk management guidelines have been formulated in light with all the earlier guidelines. The guidelines will be treated as supplement to the existing risk management guidelines. All financial institutions have been instructed to comply with this new amendment.
February 2016	• Banks have been advised to undertake the following initiatives to ensure security in ATM Transactions: a) Anti skimming and PIN shield devices should be installed in the existing ATM booths within one month. b) Video footage of ATM booths should be reviewed regularly to identify and prevent anything suspicious. c) Customer cards information and a PIN number which seems to be captured/ stolen should be voided and reissued immediately in case of own bank's cards. In case of other banks, concern card issuing bank should be informed immediately requesting to do the same. Such suspicious video footage should be sent to law enforcement agencies requesting for necessary action. d) A monthly inspection report should be submitted to Payment Systems Department of Bangladesh Bank after conducting regular examination in ATM booths on random basis.

	e) Guards of ATM booths must be provided necessary training on measures to repel fraud. Moreover, guards must be cautious about the customers wearing cap, sun glasses and carrying bags. f) Automatic SMS alert should be sent for every transaction instantly at the time of withdrawal of money from ATM booths.
March 2016	• 'Guidelines on Credit Risk Management (CRM) for Banks' have been amended to identify and mitigate new risks evolved over time. All banks and financial institutions have been instructed to comply with the amended guidelines.
March 2016	• Some amendments have been made into the 'Guidelines on Internal Control and Compliance in Banks' to mitigate banking related risks. All banks and financial institutions have been instructed to comply with the amended guidelines.
March 2016	• BB has issued guidelines regarding investment of Financial Institutions (FIs) in non-listed special purpose funds registered with Bangladesh Securities and Exchange Commission (BSEC) and instructed all FIs to follow the guidelines. The Guidelines are as follows: a) The aggregate investment in such funds made by any FI shall not exceed 50 percent of its paid up capital. b) The investment in such a single fund made by any FI shall not exceed 10 percent of its paid up capital or 20 percent of that particular fund, whichever is lower. c) The investment decision in such funds must be approved by Board of Directors of FIs and before making commitment to invest, FIs shall obtain approval from Bangladesh Bank (BB). d) The trustee of the fund shall declare that- i. No investment shall be made to purchase the share/debenture/bond or any other instruments of investor FI and its related party by such funds;

	ii. The fund has no financial claim over any bank and FI and no investment shall be made that may create such claim over any bank or FI in future. e) Investment in such funds shall be excluded from the limit mentioned in section 16 of the Financial Institutions Act, 1993.
March 2016	• Banks have been advised to take the following initiatives in the case of card-based transactions to ensure the safety and facing the risks: a) The use of personal identification number (PIN) while settling transactions by clients through their credit and debit cards using point of sale (POS) machines to be made mandatory. The merchants will have to settle the transactions through POS in presence of the clients and clients themselves will give PIN by online PIN authorization process. Manual Key entry Mode in POS has been abolished. b) Instant mobile-phone SMS (short message) alert should be sent for every card based transactions to the clients on mandatory basis. c) The acquirer bank of the POS machines will have to take responsibility and ensure the networking security so that merchants appointed by the bank cannot breach the system or leak any data of the cardholders. d) POS devices with cords have to be replaced by cordless POS. e) Point-to-Point Data Encryption for all terminals under the network of card based POS transactions has to be ensured. f) Banks will have to attach Posters with all ATM booths and merchant points of the POS machines to inform the clients about accurate use of the credit and debit cards with illustration of “use of cards by giving PIN correctly with proper safety measures and privacy”.

May 2016	• According to the Bank Company Act, 1991, the loan borrowed by any individual, organization or group will not exceed a certain limit of the capital set by the central bank, but a condition is that the ceiling will not exceed 25 percent of the bank's capital by any means. BB set the single borrower exposure limit at 15 percent of the capital in line with the said act, but ceiling is exempted for some special cases. BB has clarified that despite the exemption of 15 percent ceiling for some special cases, the ceiling of 25 percent as per the Bank Company Act will remain applicable. As such, all scheduled banks have been asked to bring down their overexposure within the fixed limit by 31 December, 2016.
May 2016	• In order to motivate women entrepreneurs in productive investments, it has been decided to allow providing 100 percent refinance/ pre-finance at preferential interest rate (bank rate + maximum 5 percent spread) to women led enterprises under the Two Step Loan (TSL) Fund of JICA assisted Financial Sector Project for the Development of Small and Medium Sized Enterprises (FSPDSME).
June 2016	• The upper limit of interest rate of agricultural and rural credit has been re-determined at 10 percent instead of 11 percent considering the downward trend of interest rate on deposits and advances.

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A SURVEY OF ECONOMIC SITUATION IN BANGLADESH: July-December 2016

The major macroeconomic indicators including real, external and financial sectors recorded moderate growth during the first half of FY17. During July-December 2016 moderate growth in broad money helped to keep inflation lower and foreign exchange reserve increased due mainly to increase in export and remittances. General inflation (base:2005-06=100) measured by twelve-month average Consumer Price Index (CPI) at the national level stood at 5.51 percent in December 2016, which was 5.92 percent in June 2016, and 6.19 percent in December 2015. Export earnings stood at US$ 16798.1 million during July-December 2016 which decreased by 7.6 percent compared to US$ 18173.3 million in preceding period and increased by 4.4 percent compared to the same period of the previous year due to mainly increase of export of plastic products, leather & leather products, jute & jute goods, wood & wood products engineering products, agricultural products, chemical products, jute & jute goods etc.

Monetary and Credit Situation

Narrow Money (M1)

Narrow money recorded a decrease of BDT 7984.4 crore or 3.8 percent to BDT 204446.3 crore during July-December 2016 as compared to the increase of BDT 44111.4 crore or 26.2 percent during January-June 2016 and the increase of BDT 7505.1 crore or 4.7 percent during July-December, 2015.

Broad Money (M2)

Broad money recorded an increase of BDT 37675.9 crore or 4.1 percent to BDT 954053.8 crore during July-December 2016 as compared to the increase of BDT 78263.7 crore or 9.3 percent during January-June 2016 and the rise of BDT 50500.1 crore or 6.4 percent during the corresponding period of the preceding year. From the analysis of component of broad money it can be said that broad money slowed down during July-December 2016 due to slow growth in demand deposits and negative growth in currency outside banks. Currency outside banks decreased by BDT 8921.1 crore or 7.3 percent and demand deposits marginally increased by 936.7 crore or 1.04 percent during July-December 2016.

An analysis of the causative factors of the change in money supply revealed that net foreign assets increased by BDT 14112.7 crore or 6.1 percent and net domestic assets increased by BDT 23563.1 crore or 3.5 percent during July-December 2016. The slow growth in net foreign assets and net domestic assets are the major factors of slow growth in broad money during the period under report.

Domestic Credit

Total domestic credit recorded an increase of BDT 30758.1 crore or 3.8 percent to BDT 832038.0 crore during July-December 2016 as compared to the increase of BDT 60635.5 crore or 8.2 percent during January-June 2016 and a rise of BDT 39117.9 crore or 5.6 percent during the same period of the previous year. The rise in domestic credit during the period under report was mainly due to increase in credit to private sector which increased by BDT 46010.2 crore or 6.9 percent during the period under review.

Reserve Money

Reserve money recorded a decrease of BDT 1703.1 crore or 0.9 percent to BDT 191498.2 crore during July-December 2016 as compared to the increase of BDT 32986.5 crore or 20.6 percent during January-June 2016 and an increase of BDT 11732.3 crore or 7.9 percent during the corresponding period of the previous year.

Auctions of Government Treasury Bills

Twenty four (24) weekly auctions of each of the 91-Day, 182-Day and 364-Day Government Treasury Bills (TBs) were held during July-December 2016. In all, 1487 bids for a total of BDT 95813.7 crore (face value) were offered in the auctions of which 380 bids for a total of BDT 30208.4 crore (face value) were accepted. Bills worth of BDT 31727.0 crore were retired during the period under report and the outstanding balance of the bills stood at BDT 56687.0 crore at the end of December 2016. A brief summary of the auctions of Treasury Bills of different tenors is given in the Table-1.

Table-1
Bangladesh Government Treasury Bills Auctions: July-December 2016

(BDT in crore)

Tenors of Treasury Bills	Bids offered		Bids accepted		Amount of retired bills	Outstanding balance of bills as on December 2016	Range of W.A. Yield of accepted bids (%)
	No. of bids	Face value	No. of bids	Face value			
1	2	3	4	5	6	7	8
91-Day	821	58416.79	202	18627.40	19027.00	19027.00	2.97-4.91
182-Day	346	21036.78	92	7084.00	5550.00	17060.00	3.20-5.41
364-Day	320	16360.14	86	4497.00	7150.00	20600.00	3.75-5.89
Total	**1487**	**95813.71**	**380**	**30208.40**	**31727.00**	**56687.00**	**2.97-5.89@**

Note: @ Overall range of the yield of treasury bills of different maturities.
Source: Monetary Policy Department, Bangladesh Bank.

Auctions of Bangladesh Government Treasury Bonds (BGTBs)

Twenty one (21) auctions of Bangladesh Government Treasury Bonds (BGTBs) were held during July-December 2016. In all, 1007 bids for a total of BDT 28004.4 crore were received in the auctions of which 366 bids for a total of BDT 8800.0 crore were accepted and BDT 635.0 crore was devolved on Bangladesh Bank. Bonds worth of BDT 7377.2 crore were retired during the period under report and the outstanding balance of the bonds stood at BDT 258175.7 crore at the end of December, 2016. The weighted average annual yields of the accepted bids were ranged between 4.4 to 8.4 percent. A brief description of the auctions of BGTB of different tenors is given in the Table-2.

Table-2

Bangladesh Government Treasury Bonds (BGTBs) Auctions: July-December 2016

(BDT in crore)

Tenors of Treasury Bonds	Bids offered		Bids accepted		Amount of Retired Bonds	Outstanding balance of bonds as on December 2016	Range of W.A Yield of Accepted bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value			
1	2	3	4	5	6	7	8
2-year	*223*	7498.62	50	1610.00	*3000.00*	18162.00	4.39-6.50
5-Year	206	6505.11	83	2205.54	2400.00	66740.00	5.72-7.09
10-Year	235	7213.33	113	2596.50	1977.15	99566.96	6.32-7.46
15-Year	158	2981.95	60	873.00	0.00	39532.50	7.46-7.97
20-Year	185	3805.39	60	880.00	0.00	34174.40	7.89-8.44
Devolvement on Bangladesh Bank				634.96			
Total	**1007**	**28004.40**	**366**	**8800.00**	**7377.15**	**258175.86**	**4.39-8.44@**

Note: @ Overall range of treasury bonds of different maturities.

Source: Monetary Policy Department, Bangladesh Bank.

REPO Auctions

A total number of six (06) auctions of REPO (Liquidity Support Facility & Special Repo) operations were held on daily basis during the period July-December 2016. In all, 6 bids of 1-Day to 2-Day and 3-Day to 7-Day tenor amounting total of Taka 115.7 crore were received in these auctions, of which all the bids were accepted for a total of Taka 115.7 crore. The interest rate of the accepted bids was ranged between 6.8 to 9.8 percent per annum during the period under report. A brief summary of the auctions of REPO of different tenors is given in the Table -3.

Table-3

REPO Auctions: July-December 2016

(BDT in crore)

Total No. of auctions held during the period	Tenor	Bids received		Bids accepted		Interest rates of the accepted bids (%)
		No. of bids	Face value	No. of bids	Face value	
1	2	3	4	5	6	7
6	1-Day-2-Day	3	34.17	3	34.17	6.75-9.75
	3-Day-7-Day	3	81.50	3	81.50	6.75
	Total	**6**	**115.67**	**6**	**115.67**	**6.75-9.75**

Source: Monetary Policy Department, Bangladesh Bank.

Reverse REPO Auctions

A total number of sixty five (65) auctions of Reverse Repo operation were held on daily basis during July-December 2016. In all, 76 bids of 1-2 Day to 3-7 Day tenor amounting to BDT 8310 crore (face value) were received in these auctions and no bids were accepted in these auctions during the period under report. A brief description of Reverse Repo auctions is given in Table-4.

Table-4

Reverse REPO Auctions: July-December 2016

(BDT in crore)

Total No. of auctions held during the period	Tenor	Bids received		Bids accepted		Interest rates of the accepted bids (%)
		No. of bids	Face value	No. of bids	Face value	
1	2	3	4	5	6	7
65	1-2 Day	66	7240.00	0	0.00	0.00
	3-7 Day	10	1070.00	0	0.00	0.00
	Total	**76**	**8310.00**	**0**	**0.00**	**0.00**

Source: Monetary Policy Department, Bangladesh Bank.

Auctions of Bangladesh Bank Bills

7-Day Bangladesh Bank Bills

One hundred fifteen (115) auctions of 7-Day Bangladesh Bank Bills (BB Bill) were held during July-December 2016. In all, 1398 bids for a total of BDT 417773.0 crore (face value) were received in the auction of which all bids for a total of BDT 417773.0 crore were accepted. The outstanding balance of the bills stood at BDT 400476.0 crore at the end of December 2016. The weighted average yields of the accepted bids were ranged between 2.96-2.98 percent. A brief description of BB Bills auctions is given in Table-5.

Table-5

7-Day Bangladesh Bank Bills: July-December 2016

(Crore Taka)

Bangladesh Bank Bills	Bids offered		Bids accepted		Outstanding balance of bills as on December, 2016	Range of W.A. Yield of Accepted Bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value		
1	2	3	4	5	6	7
7-Day	1398	417773.00	1398	417773.00	400476.00	2.96-2.98

Source: Monetary Policy Department, Bangladesh Bank

14-Day Bangladesh Bank Bills

Ninety seven (97) auctions of 14-Day Bangladesh Bank Bills (BB Bill) were held during July-December 2016. In all, 252 bids for a total of BDT 85833.0 crore (face value) were received in the auction of which all bids for a total of BDT 85833.0 crore were accepted. The outstanding balance of the bills stood at BDT 93488.0 crore at the end of December 2016. The weighted average yields of the accepted bids were ranged between 2.50-2.98 percent. A brief description of BB Bills auctions is given in Table-6.

Table-6
14-Day Bangladesh Bank Bills: July-December 2016
(BDT in crore)

Bangladesh Bank Bills	Bids offered		Bids accepted		Outstanding balance of bills as on December, 2016	Range of W.A. Yield of Accepted Bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value		
1	2	3	4	5	6	7
14-Day	252	85833.00	252	85833.00	93488.00	2.50-2.98

Source: Monetary Policy Department, Bangladesh Bank.

30-Day Bangladesh Bank Bills

Eighty nine (89) auctions of 30-Day Bangladesh Bank Bills (BB Bill) were held during July-December 2016. In all, 1592 bids for a total of BDT 234821.6 crore (face value) were received in the auction of which 1364 bids for a total of BDT207282.6 crore were accepted. The outstanding balance of the bills stood at BDT 12958.2 crore at the end of December 2016. The weighted average yields of the accepted bids were ranged between 2.93-2.97 percent. A brief description of BB Bills auctions is given in Table-7.

Table-7
30-Day Bangladesh Bank Bills: July-December 2016
(BDT in Crore)

Bangladesh Bank Bills	Bids offered		Bids accepted		Outstanding balance of bills as on December, 2016	Range of W.A. Yield of Accepted Bids (%)
	No. of Bids	Face Value	No. of Bids	Face Value		
1	2	3	4	5	6	7
30-Day	1592	234821.60	1364	207282.60	12958.20	2.93-2.97

Source: Monetary Policy Department, Bangladesh Bank.

Government Revenue Receipts

The government revenue receipts stood at Taka 93156.3 crore during July-December 2016 which is 38.4 percent of the annual target of BDT 2,42,752.0 crore while it was 38.6 percent of its annual target at the end of December 2015. During the period under report, the revenue receipts was 6.7 percent lower than the amount of Taka 99809.4 crore earned during January-June 2016 but 36.8 percent higher than the amount of Taka 68083.3 crore earned during July-December 2015.

Receipts from the Value Added Tax (VAT) stood at Taka 11761.4 crore during July-December 2016, which was 5.9 percent higher than the receipts of Taka 11111.2 crore during January-June 2016 but 54.8 percent lower than the receipts of Taka 26006.8 crore during July-December 2015.

Agricultural Credit

Agricultural credit disbursed by the all banks stood at BDT 9933.1 crore during July-December 2016, which was 11.7 percent higher than that of BDT 8890.4 crore during January-June 2016. During July-December 2015, disbursement of agricultural credit stood at BDT 8756.0 crore, which was 13.4 percent higher than that of the reporting period. The recovery of agricultural credit stood at BDT 8991.3 crore during July-December 2016, which was 4.1 percent higher than that of BDT 8635.1 crore during January-June 2016. During July-December 2015, recovery of agricultural credit stood at BDT 8421.4 crore, which was 6.8 percent higher than that of the reporting period. The outstanding of agricultural credit stood at BDT 35904.7 crore at the end of December 2016, which was 4.1 percent higher than that of BDT 34477.4 crore at the end of June 2016. At the end of December 2015, outstanding of agricultural credit stood at BDT 32536.8 crore, which was 10.4 percent higher than that of the end of December 2016.The overdue of agricultural credit stood at BDT 6430.5 crore at the end of December 2016, which was 13.3 percent higher than that of BDT 5678.3 crore at the end of June 2016. At the end of December 2015, overdue of agricultural credit stood at BDT 6210.4 crore, which was 3.5 percent higher than that of the end of December 2016.

Inflation Situation

General inflation (base:2005-06=100) measured by twelve-month average Consumer Price Index (CPI) at the national level stood at 5.51 percent in December 2016, which was 5.92 percent in June 2016, and 6.19 percent in December 2015. On the other hand, general inflation measured by point to point CPI at the national level was 5.03 percent in December 2016, which was 5.53 percent in June 2016 and 6.10 percent in the corresponding month of the preceding year.

Average food inflation at the national level stood at 4.51 percent in December 2016, which was 4.90 percent in June 2016 and 6.05 percent in December 2015. Food inflation measured by point to point basis at the national level was 5.38 percent in December 2016, which was 4.23 percent in June 2016, and 5.48 percent in December 2015.

Average non-food inflation at the national level stood at 7.05 percent in December 2016, which was 7.47 percent at the end of June 2016 and 6.41 percent in December

2015. Non-food inflation measured by point to point basis at the national level was 4.49 percent, which was 7.50 percent in June 2016 and 7.05 percent in the corresponding month of the preceding year.

Food Situation

The target for domestic production of food grains during FY16-17 was set at 365.91 lac metric tons, which was 1.6 percent higher than 360.0 lac metric tons produced during FY15-16.

For FY16-17, the target for total import (government & private) of food grains in the country was set at 55.0 lac metric tons, which was higher by 21.2 percent than 45.4 lac metric tons imported during FY15-16. Import of food grains during July-December 2016 stood at 31.9 lac metric tons against 23.8 lac metric tons imported during January-June 2016 and 21.6 lac metric tons during July-December 2015.

The target for domestic procurement of food grains during FY16-17 was fixed at 19.5 lac metric tons, which was higher 58.3 percent than 12.3 lac metric tons during FY15-16. Procurement of food grains during July-December 2016 stood at 11.1 lac metric tons against the procurement of 1.6 lac metric tons during January-June 2016 and 10.7 lac metric tons during July-December 2015.

For FY16-17, government distribution of food grains was targeted at 23.6 lac metric tons, which was higher by 14.5 percent than 20.6 lac metric tons distributed during FY15-16. Distribution of food grains during July-December 2016 stood at 10.7 lac metric tons against the distribution of 14.5 lac metric tons during January-June 2016 and the distribution of 6.1 lac metric tons during July-December 2015.

The target for food grains stock during FY16-17 was set at 13.0 lac metric tons, which was 51.4 percent higher compared to the stock of 8.6 lac metric tons at the end of FY15-16. Food grains stock at the end of December 2016 stood at 7.9 lac metric tons against the stock of 8.6 lac metric tons at the end of June 2016 and the stock of 15.3 lac metric tons at the end of December 2015.

Stock Exchange Activities

In the Dhaka Stock Exchange Ltd. (DSE), the total number of listed securities stood at 560 including 221 Government Treasury Bonds at the end of December 2016. During the period July-December 2016, a total of 20310.5 million shares and debentures worth Taka 67382.8 crore were traded as against 14601.5 million shares and debentures worth Taka 51774.3 crore during January-June 2016. It was 39.1 percent higher in volume and 30.1 percent higher in value than that of the preceding period. The market capitalization of DSE stood at Taka 341244.2 crore at the end of the period under report, which was 7.1 percent higher than Taka 3,185,74.9 crore at the end of the preceding period. The All Share Price Index of DSE stood at 5036.1 points at the end of December 2016, which was 11.7 percent higher than 4,507.6 points at the end of June 2016.

In the Chittagong Stock Exchange Ltd. (CSE), the total number of listed securities stood at 300 at the end of December 2016. During the period July-December 2016, a total of 1490.3 million shares and debentures worth Taka 4736.0 crore were traded as against 1255.3 million shares and debentures worth Taka 3571.6 crore during the preceding six months. It was 18.7 percent higher in volume and 32.6 percent higher in value than that of the preceding period. The market capitalization of CSE stood at Taka 268304.0 crore at the end of the period under report, which was 7.5 percent higher than that of Taka 249684.89 crore at the end of the preceding period. The All Share Price Index of CSE stood at 15,477.7 points at the end of December 2016, which was 12.1 percent higher than that of 13,802.6 points at the end of June 2016.

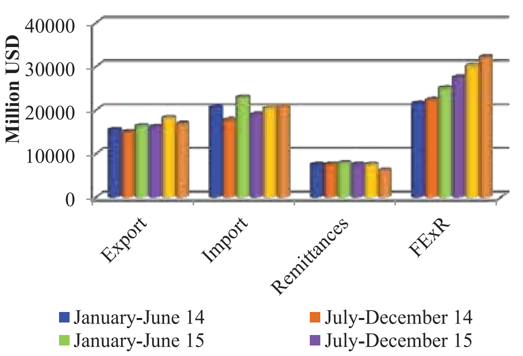
Exports, Imports, Remittances and Foreign Exchange Reserves

The key components of external sector of a country are Export, Import, Remittance and Foreign Exchange Reserve. The changes in these components of external sector of Bangladesh for the period of ***July-December 2016*** are discussed below:

Export earnings stood at US$ 16798.1 million during ***July-December 2016*** which decreased by 7.6 percent compared to US$ 18173.3 million in preceding period and increased by 4.4 percent compared to the same period of the previous year. The half yearly trend of export changed due mainly to increase of export of plastic products, leather & leather products, jute & jute goods, wood & wood products engineering products, agricultural products, chemical products, jute & jute goods etc.

In ***July-December 2016, Import*** payments increased slightly by 2.5 percent to US$ 20894.9 million during the period under report compared to US$ 20384.2 million in previous period and 10.0 percent higher than the same period of the preceding year. The half yearly increased in import payments was partially caused by Prepared food stuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes, Mineral products, Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut), Wood

Graph: Half-Yearly Comparison



and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork.

Remittance earnings of the country stood at US$ 6166.82 million during ***July-December 2016*** which was both decreased by 17.2 percent and 17.6 percent compared to the previous period and the same period of the preceding year respectively. Mainly for having the stay permission/VISA renewal permission after paying a specific fee decreased remittance from KSA, UAE, Kuwait, Bahrain, UK, Singapore, Malaysia and other countries.

In ***July-December 2016 Foreign Exchange Reserve*** of the country increased by 6.4 percent and 16.7 percent respectively to US$ 32092.2 million compared to the previous period and the same period of the preceding year. The half-yearly data of the country's Foreign exchange reserve, Export, Import and Remittances are shown in the Table-1 and half-yearly growth (%) and yearly growth (%) are shown in the Table-2.

Table-1 **(In Million USD)**

Period	Export	Import	Remittances	FExR
January-June 2014	15491.0	20800.0	7455.2	21467.1
July-December 2014	14914.2	17755.0	7487.2	22309.8
January-June 2015	16294.7	22930.0	7829.8	25025.2
July-December 2015	16083.9	18991.0	7487.2	27493.3
January-June 2016	18173.30	20371.8	7443.96	30168.2
July-December 2016	16798.1	20894.9	6166.8	32092.2

Sources: Statistics Department, Bangladesh Bank.
Bangladesh Bank website

Table -2

Period	Half yearly % Change				Yearly % change			
	Export	Import	Remittances	FExR	Export	Import	Remittances	FExR
January-June 2014	5.5	4.4	10.1	18.6	7.4	18.7	10.7	40.2
July-December 2014	-3.7	-14.6	0.4	3.9	1.6	-10.9	10.5	23.3
January-June 2015	9.3	29.1	4.6	12.2	5.2	10.2	5.0	16.6
July-December 2015	-1.3	-17.2	-4.4	9.9	7.8	7.0	0.0	23.2
January-June 2016	**13.0**	**3.3**	**-0.6**	**9.7**	**11.5**	**3.2**	**-4.9**	**20.6**
July-December 2016	**-7.6**	**2.5**	**-17.2**	**6.4**	**4.4**	**6.0**	**-17.6**	**16.7**

Chronology of Major Policy Announcements: July-December, 2016

Policy Announcements on Banking and Financial Sector Development: July-December, 2016

July 2016	• Agricultural and Rural Credit Policy and Program for FY17 have been announced by the Bangladesh Bank.
July 2016	• Scheduled banks can disburse agricultural and rural credit under agent banking in addition to their ongoing agricultural credit disbursement system. A circular has been issued indicating how to carry out agricultural and rural credit activities under agent banking.
July 2016	• In order to further expand agricultural credit disbursement, the perspective of introducing Agent Banking guideline by Bangladesh Bank, the scheduled banks which are running Agent Banking, can participate in the agriculture and rural financing activities through Agent Banking along with existing agricultural credit disbursement system. a) Agent booth will play role in receiving loan applications, conducting primarily scrutinisation, disbursements and collection of agricultural and rural credit from borrowers. However, loan application processing, approval and necessary supervision activities have to be carry out by the bank. b) Agriculture and rural credit can be disbursed in the sectors and subsectors under Bangladesh bank's agriculture and rural credit policy. Bank should strive to disburse 60% of their disbursement target including disbursement through agent banking in crop sector. c) Interest rate ceiling of Bangladesh Bank's agricultural and rural credit policy will be applicable for disbursing agricultural and rural credit through Agent Banking system. d) In addition to the prevailing interest rate maximum 0.50% service charge (including VAT) can be collected from the customer. Banks will debit this service charge to the Agent's account by cutting it from borrowers account i.e. agents are not authorized to receive service charges directly from borrowers.

August 2016	• In order to provide credit under refinance scheme on milk production and artificial breeding, no complementary collateral will be required. However, other existing rules and guidelines of Bangladesh Bank concerning this credit facility will remain effective.
September 2016	• To strengthen the private building safety of RMG factories (Retrofitting, Rebuilding, Relocation, and Fire Safety) through short to long term finance, Bangladesh Bank has launched the "Urban Building Safety Project" with the assistance of JAPAN International Cooperation Agency (JICA). The fund size of the Two Step Loan project (TSL) is 4129 million Japanese Yen. To get the fund, RMG factories should be located in Dhaka, Narayangonj and Gazipur District and Chittagong city. Under the Fund, PFIs will be provided with refinance or pre-finance for lending. An end-borrower can get the loan amount up to BDT 350 million at the maximum interest rate of 6%.
October 2016	• Thirty two contracted banks have been advised to submit quarterly report instead of monthly progress report regarding disbursement of loans against self declared target under refinance scheme of BDT 200 crore for 10 Taka account holders.
December 2016	• Bangladesh Bank (BB) has taken initiatives to ensure a stable and environment-friendly banking and overall CSR activities to support the Sustainable Development Goals (SDGs). To achieve the goal more fruitfully and efficiently, BB has instructed the banks and financial institutions to set up a separate 'Sustainable Financial Unit' (may be in name of department/cell/division) in the head offices of banks and financial institutions. The BB advised the banks and financial institutions to form a 'Sustainable Finance Committee' led by a senior most Deputy Managing Director for monitoring and planning sustainable banking and financing related activities.

December 2016	• Guidelines on core banking solution features and controls have been issued to formulate a uniform set of instructions that should be accommodated as minimum requirement but not limited to in any Core Banking Solution (CBS).
December 2016	• All commercial banks and financial institutions have to make sure for all type of their loans and advances that potential borrowers should compulsorily install and monitor Effluent Treatment Plant (ETP) where applicable. This Instruction will also be applicable for all existing financing.

Call for Papers and Notes to the Contributors

JOURNAL OF THE INSTITUTE OF BANKERS, BANGLADESH is a half-yearly peer-refereed Journal, published in June and December. The Journal contains research based papers on Trade, Insurance, Finance and Banking related issues. A list of topics on these areas has been suggested at the end but undoubtedly it is not a comprehensive one.

Contributors are requested to submit papers/articles on the above issues for publication in the journal.

The following may be treated as guidelines for submission of the article/paper:

1. The article/paper should be based on research and should demonstrate the author's own analysis, thought and judgment.

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3. The manuscript must be typed (Font–Times New Roman, Font Size-11 point) on one side of the paper in double space and normally should not exceed 20 pages.

4. All footnotes and Equations should be numbered consecutively. Explanation of footnotes should be given at the bottom page.

5. An abstract of 150 words or less (in Time New Roman 9 point) should be given along with the article/paper.

6. Keywords of the paper should be given below the abstract.

7. Bibliographical references should be made in a defined structure.
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Hicks, Junior R., 1946, *Value and Capital,* Oxford University Press.

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a) Smith (1998)
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12. Two hard copies of the paper/article along with a CD should be submitted to:

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28. Disclosure, Financial Reporting and Corporate Governance.
29. Reaction of Security Price to Announcement of Earnings, Dividend, Capital Structure Change, and so on—Event Study.
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