



Monetary Policy Review

December, 2021



Bangladesh Bank

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Coordinator

Md. Abdus Sobhan, Assistant Director, Chief Economist's Unit

Cover Design

Isaba Farheen, Deputy Director, Department of Communications and Publications

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Bangladesh Bank
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Message



The Monetary Policy Review (MPR) of Bangladesh Bank (BB) aims to critically analyze macro-monetary and financial sector issues while assessing BB's current monetary policy stance in maintaining stable inflation and supporting sustained economic growth. Thus, the MPR supplements BB's Monetary Policy Statement (MPS), which is announced at the beginning of the fiscal year to communicate major developments in monetary, fiscal, and exchange rates policies with all concerned stakeholders.

The current MPR comes out during a time when the COVID-19 pandemic has run into the third year, scarring the global economy severely. As such, policymakers across the advanced and emerging economies took supportive monetary and fiscal policies to avert the worst outcomes and restore economies gradually towards normal trends while facing new challenges and risks at domestic and global fronts in the near and medium-term.

The BB responded timely and appropriately with an expansionary and accommodative monetary policy stance in supporting broad-based economic activities while limiting inflation at a tolerable level. Besides, BB undertook a wide range of supportive financial sector policies consistent with the government's stimulus packages to counteract the COVID-19 impacts on the economy. As a result, the economic growth recovered faster to 6.94 percent in FY21 from 3.45 percent in FY20.

The current volume reviews the overall macroeconomic scenario amid recurrent waves of transmission of mutant coronavirus across the country, discussing BB's monetary policy responses, financial market conditions, emerging economic risks, and available policy options in the backdrop of monetary tightening in advanced and emerging economies. It also highlights the sectoral economic outlook based on the expected economic outcome at home and abroad.

I appreciate the sincere and diligent efforts of the Chief Economist and his team for putting forth an informative MPR to supplement BB's half-yearly MPS by analyzing the impacts of monetary policy measures. I would also like to thank all supporting departments for providing valuable inputs for this review.

We shall consider our efforts fruitful if this review somewhat satisfies the needs of the intended stakeholders.

Fazle Kabir
Governor

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List of Abbreviations

ADs	Authorised Dealers
ADR	Advance Deposit Ratio
BB	Bangladesh Bank
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
BOP	Balance of Payment
BSEC	Bangladesh Securities and Exchange Commission
CI	Confidence Interval
CMSME	Cottage, Micro, Small and Medium Enterprise
COVID	Corona Virus Disease
CPI	Consumer Price Index
CRR	Cash Reserve Ratio
CRR	Cash Reserve Requirement
DSE	Dhaka Stock Exchange
DSEX	DSE Broad Index
EDF	Export Development Fund
EU	European Union
FA	Financial Account
FDI	Foreign Direct Investment
FOB	Free on Board
FX	Foreign Exchange
FY	Fiscal Year
GCC	Gulf Cooperation Council
GDP	Gross Domestic Products
IDR	Investment Deposit Ratio
IMF	International Monetary Fund
IPO	Initial Public Offering
LC	Letter of Credit
MCFIs	Micro Credit Financing Institutions
MMT	Million Metric Tons
MPS	Monetary Policy Statement
NBFIs	Non-bank Financial Institutions
NDA	Net Domestic Assets
NEER	Nominal Effective Exchange Rate
NFA	Net Foreign Asset
NSCs	National Savings Certificates
REER	Real Effective Exchange Rate
RM	Reserve Money
RMG	Ready-made Garment
SLR	Statutory Liquidity Ratio
TDTL	Total Demand and Time Liabilities
USD	United States Dollar
WEO	World Economic Outlook
y/y	Year on Year

Executive Summary

The Monetary Policy Review (MPR) 2021 reviews the current macroeconomic scenario, assesses the monetary policy stance of FY22 and provides sectoral economic outlooks. In part 1, the MPR covers global and domestic macroeconomic activities in real, monetary, and external sectors, along with assessing the monetary policy stance of FY22. Part 2, however, presents two analytical research papers.

The recovery of the global economy was somewhat interrupted by the imposition of fresh containment measures in response to the spread of the Omicron COVID-19 variant. Lingering supply shocks and surging global energy and commodity prices have resulted in higher inflation in many economies. To tame the inflationary pressures, central banks in advanced economies and many emerging market economies are tightening their policy rates and tapering pandemic-related emergency supports resulting in a slower economic recovery process. Against this backdrop, the International Monetary Fund and the World Bank made a downward revision to their global economic growth forecasts for 2022 and 2023.

Despite decelerated and uneven global economic recovery trends, Bangladesh economy exerted a strong rebound with 6.94 percent real GDP growth in FY21 after economic fallout from the COVID-19 pandemic, aided by well-coordinated monetary and fiscal policy supports, better management of the pandemic situation, and an upbeat of business confidence. The speed of this recovery appeared to have strengthened further in H1FY22, despite the outbreak of the Omicron variant of COVID-19, reflected in a surge in import and export demand, a peak up in private credit demand, and a strong growth of large and medium scale manufacturing output.

Driven by the non-food component, the headline CPI inflation exhibited an upward trend in H1FY22, reaching 6.05 percent (point to point) in December 2021, due mainly to the pass-through of elevated global commodity prices in the face of supply shocks, higher shipping cost, and the knock-on effect of a recent upward adjustment of fuel (diesel and kerosene) price in the domestic market. Similarly, twelve-month average CPI inflation crept up to 5.55 percent in December 2021—slightly higher than the target of 5.30 percent for FY22. It is expected that price pressure may continue for some time and is likely to miss the target set for FY22.

The current account (CA) balance recorded a sizeable deficit of USD 8.2 billion in H1FY22 against a surplus of USD 3.52 billion in H1FY21 owing to a decline in remittance inflows and a widening trade balance in face of a faster rise in import payments than export receipts. Notwithstanding a growing surplus in the financial account, the overall balance posted a deficit of USD 1.8 billion, creating a depreciating pressure on the exchange rate during this period. BB's official foreign exchange reserve stood at USD 46.2 billion at the end of December 2021, which is equivalent to prospective import payments of 5.6 months.

To maintain overall price stability and support growth recovery momentum, the BB has been pursuing an expansionary and accommodative monetary policy by setting broad money (M2) growth target at 13.8 percent for December 2021 and 15.0 percent for June 2022, along with a growth target of private sector

credit at 11.0 percent and 14.8 percent, respectively, for the same periods. In line with this policy stance, BB has kept its key rates unchanged at lower levels, e.g., cash reserve ratio, bank rate, and reverse repo at 4.00 percent each and repo rate at 4.75 percent. As per the latest available data, the broad money (M2) growth, the main anchoring variable used as an operating target of BB's monetary policy, remained well below the target mainly because of lower growth of reserve money highly influenced by lower growth in net foreign assets stemmed from a sizeable BoP deficit during H1FY22.

Broad money (M2) growth declined to 9.60 percent at the end of H1FY22 mainly because of a sharp decline in net foreign assets (NFA) growth. In contrast, the growth of net domestic assets (NDA) continued accelerating on the back of rebounding growth in credit to the private sector and soaring of credit to the public sector. The growth of credit to the private sector continued to gain momentum reaching 10.68 percent at the end of H1FY22, aided by recovery of aggregate demand on the one hand and overall low cost of credit on the other. A rise in private credit growth and BB's mop-up measures to rationalize liquidity in the banking system together raised interest rates in the interbank market. In contrast, the interest rates in the retail market remained moderate.

During the first half (H1) of FY22, overall domestic financial markets remained vibrant and resilient amidst recurrent waves of the COVID-19 pandemic, reflected in easy liquidity and movements in the rates of money, foreign exchange, the securities market. The BB contributed well to stabilize the financial market through an expansionary and accommodative monetary policy stance in FY21 and FY22. During FY21 and H1FY22, BB's various initiatives such as easy liquidity access to the banking system, maintaining balanced and competitive foreign exchange rates, watchful monitoring, and careful supervision helped preserve financial markets' harmony in the country. In this regard, the BB used necessary policy tools throughout FY21 and H1FY22 to maintain sufficient liquidity in the money market to ensure the availability of enough loanable funds in the system for banks and investors amidst the ongoing COVID-19 pandemic.

Looking ahead, given the current falling rate of COVID-19 infections, ongoing extended vaccination program, the continuation of growth supportive fiscal and monetary measures, along with solid growths in imports and exports, are expected to help strengthen economic recovery further in attaining the real GDP growth of 7.2 percent, a target set for FY22. However, this growth prospect may be clouded by a number of risk factors, such as the duration and severity of the ongoing pandemic, elevated global commodity prices, and unanchored inflation expectations both on the international and domestic front. The robust import growth on top of the recent moderation in the growth of the inward remittance may create an unfavorable position in the balance of payments. The exchange rate of BDT against USD has started to depreciate in recent periods, which may act as an automatic stabilizer boosting the export earnings and reducing the import payments to improve the balance of payments position in the near future. The recent global commodity price hikes amid unfolding geopolitical conflicts may exert some inflationary pressures in the coming days, making it difficult to maintain the CPI inflation within the target set for FY22.

Part 1

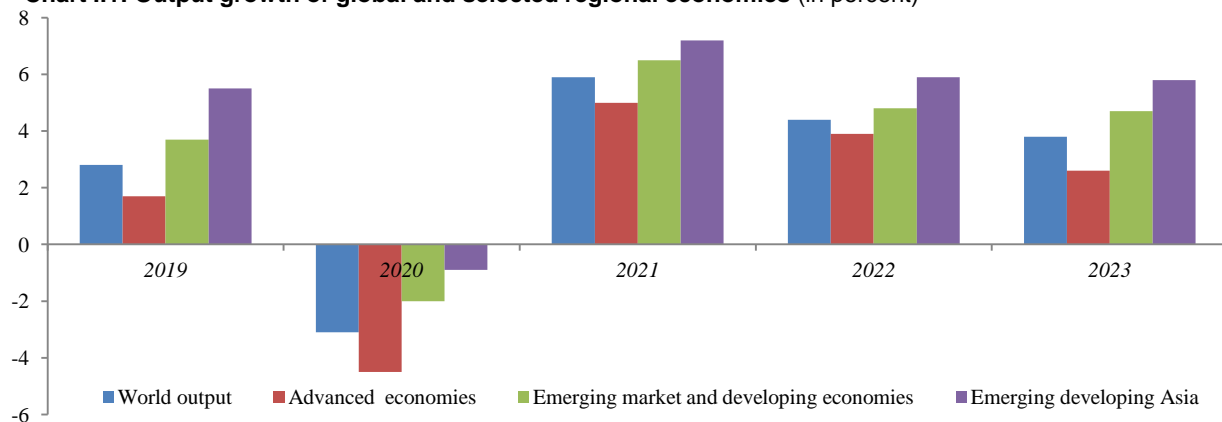
Macroeconomic Outlook and Monetary Policy Stance of FY22

The global economic activities present a depressed mood for 2022 with disrupted recovery, deepening uncertainty and higher inflation. This depressed mood is broad-based across advanced and emerging market economies and may continue up to 2023. To fight against inflation, almost all central banks of advanced economies are tightening their monetary policy which may dampen economic recovery and heighten global financial disruption in 2022.

I.1 Global Economic Growth

Global economic growth is forecasted to decelerate from 5.9 percent in 2021 to 4.4 percent in 2022¹(Chart I.1), due mainly to reduced economic growth predicted for the top two largest world economies, the USA and China. This forecast of global growth is half a percentage point down from October 2021 WEO as IMF revised its assumptions including removing the US's "Build Back Better" fiscal policy package from the baseline, and earlier withdrawal of monetary accommodation and continued supply shortages in the United States and lingering financial stress in China. Overall, global growth is forecasted to slide to 3.8 percent in 2023, though 0.2 percentage points higher than that in the previous forecast supported by declining severity of the pandemic, improved vaccination rates and more effective therapies worldwide.

Chart I.1: Output growth of global and selected regional economies (in percent)



Source: World Economic Outlook, January 2022 (Update), IMF.

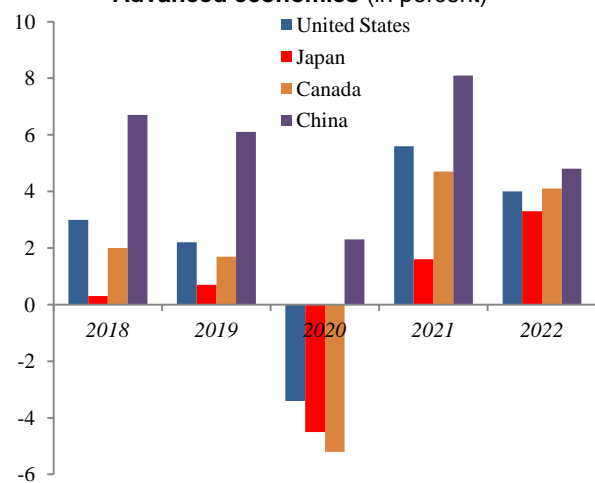
Overall, persistence and rapid transmission of Omicron variant of the coronavirus, supply constraints, and mobility restrictions toward the end of 2021 are expected to drag economic growth down in early 2022. Two largest world economies, the US and China, are expected to grow by 4.0 percent and 4.8 percent in 2022, markedly below the 5.6 percent and 8.1 percent growth in 2021, respectively (Chart I.2). South Asia region would maintain positive growth in 2021 and 2022, depicted in Chart I.3, indicating a strong recovery. Indian economic growth is expected to return to its pre-pandemic trend and surpass the trend in 2021 (Chart I.3). Bangladesh economy is predicted to grow by 6.9 percent in 2022, 0.5 percentage-point

¹World Economic Outlook, IMF, January 2022

² Planning Commission, June 2020.

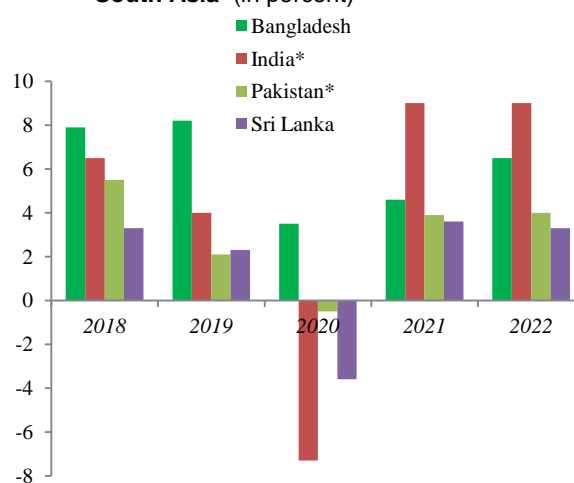
higher than 6.4 percent in 2021 (Global Economic Prospects, World Bank, January 2022). However, this growth is still below the pre-pandemic growth rates (Chart I.3).

Chart I.2: Economic growth of peer countries: Advanced economies (in percent)



Source: World Economic Outlook, January 2022 (update), IMF.

Chart I.3: Economic growth of peer countries: South Asia (in percent)

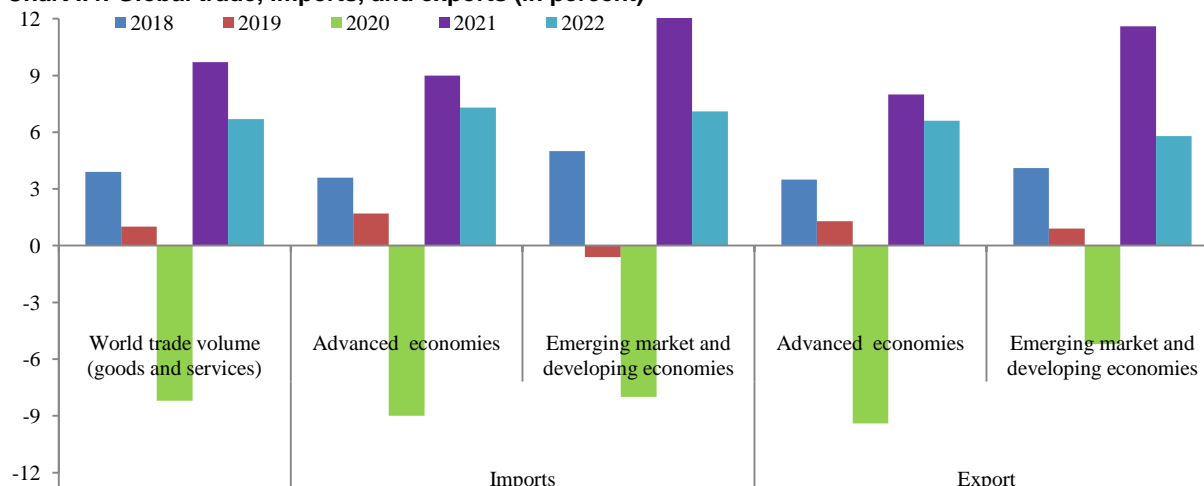


Source: World Economic Outlook, October 2021 and *January 2022, IMF.

I.2 Global Trade

Global trade is projected to moderate in 2022 and 2023, aligned with the overall pace of the economic expansion on the back of eased supply constraints, assuming dissipating severity of the pandemic. Despite a contraction of 8.2 percent in 2020, world trade volume grew by 9.3 percent in 2021, consistent with the global recovery. However, trade volume is projected to grow by 6.0 percent in 2022. (WEO, January 2022) (Chart I.4).

Chart I.4: Global trade, imports, and exports (in percent)

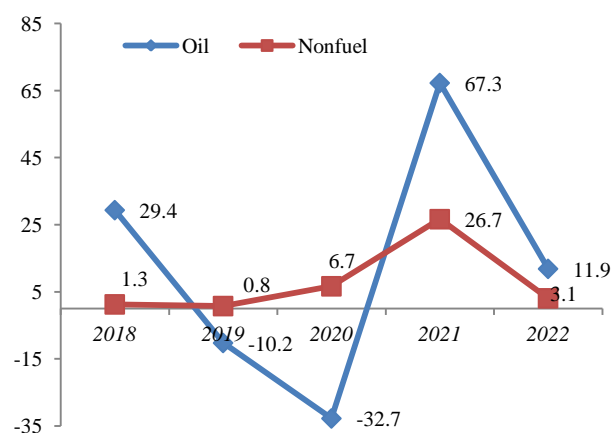


Source: World Economic Outlook, October 2021, IMF.

I.3 Commodity prices

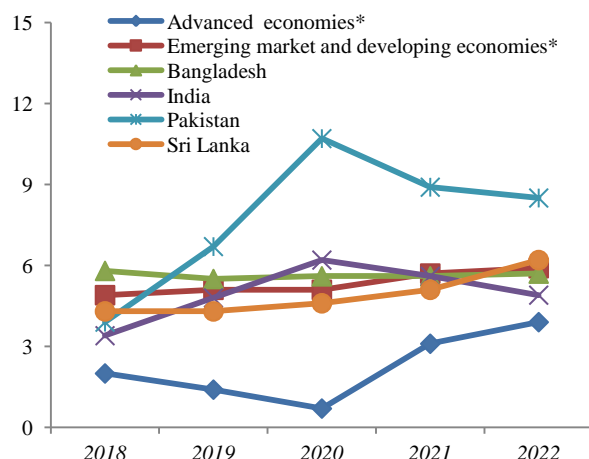
Commodity prices have trended up with recovering economic activities. Oil prices are expected to increase about 12 percent and non-fuel prices about 3 percent in 2022 which are comparatively much lower than the increase predicted for 2021 (WEO, January 2022) (Chart I.5). The average price of oil was USD 69.07 a barrel in 2021. Based on the future markets, the WEO assumes that the average price of oil would increase to USD 77.31 a barrel in 2022 and USD 71.29 a barrel in 2023.

Chart I.5: Global commodity prices, in percent (year on year)



Source: World Economic Outlook, January 2022(update), IMF.

Chart I.6: Consumer prices: global and emerging markets and selected peer countries of South Asia (in percent)



Source: World Economic Outlook, October 2021 and *January 2022, IMF.

I.4 Inflation

Expansionary monetary and fiscal policies adopted for bolstering economic activities during the pandemic and persistent supply constraints are keeping global inflation elevated in the near term, averaging 3.9 percent in advanced economies and 5.9 percent in emerging market and developing economies in 2022, before subsiding in 2023. The headline inflation might be contained if inflation expectations remain well anchored, the transmission and severity of COVID-19 dissipate, the supply disruptions ease, monetary policy tightens, and global demand rebalances.

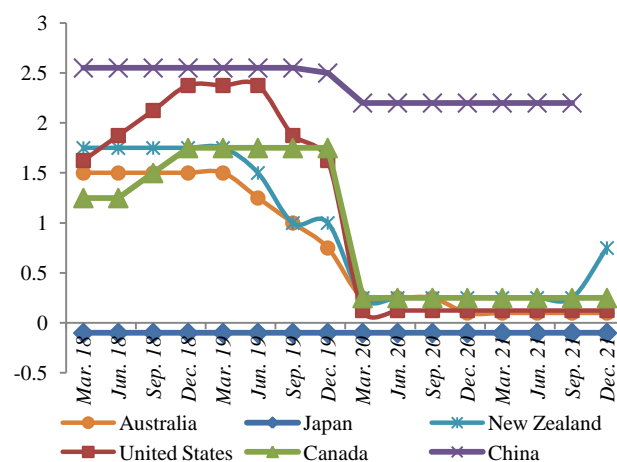
Among the selected South Asian countries as shown in Chart I.6, the IMF forecasted that India and Pakistan would be able to lower inflation rate in 2021 and 2022 compared to that of 2020, while Bangladesh would contain inflation around 5.6 percent. However, inflation in Sri Lanka is projected to increase in the upcoming years.

I.5 Policy Rate

Advanced economy central banks, i.e., the Federal Reserve System, Bank of England, Bank of Japan and European Central Bank have left policy rate unchanged since March 2020 (Chart I.7). Since there is a limited space for conventional monetary policy and fiscal policy, central may be under pressure to deploy unconventional policy tools to support economic recovery and minimize adverse economic

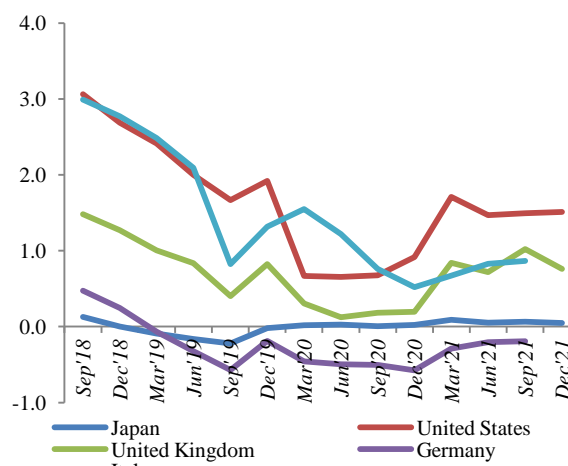
shocks. Ten-year government bond yields in the US and the UK went up significantly in December 2021 compared to that of December 2020, resulting in higher returns on safe assets which are transmitted globally (Chart I.8). The space for monetary policy responses is exhausted in Japan and the euro area, and emerging market economies too face no room for further policy response fearing capital outflows.

Chart I.7: Central bank's policy rate of selected advanced economies.



Source: International Financial Statistics 2022, IMF.

Chart I.8: 10-year government bond yields of selected advanced economies



Source: <https://tradingeconomics.com>

I.6 Risk and Outlook

Global economy faces many risks such as health, limited space of fiscal and monetary policies, supply constraints, labor market distortions, external financial conditions and structural shifts. These risks have tilted to downsize global economic recovery and heighten global financial disruptions in 2022.

Elevated Health Risks

Health risks remain at elevated levels in emerging market and developing economies owing to slow rollout of vaccination, despite rapid and effective rollouts of vaccination programs in most advanced economies (WEO, January 2020). With recurrent waves of the COVID-19 variants, health care system is overwhelmed. Even though symptoms are less severe, the Omicron variant has amplified transmissibility rates, and has put extra pressure on hospitals, created labor shortages, and triggered tighter and longer-lasting mobility restrictions.

Limited Space of Fiscal and Monetary Policies

The unprecedented expansion of monetary and fiscal policy has squeezed policy space because of high inflationary pressures, low tax revenues and rising public debt. Central banks are in a dilemma as they have to raise interest rate to contain inflation on the one hand and the lingering of the pandemic necessitating easy credit availability and low interest rate on the other. Maintenance of low interest rates is likely to trigger a flight to safety, raise spreads for riskier borrowers, and thus impose pressures on emerging market currencies, firms, and fiscal positions.

Supply Constraints

Supply chain disruptions in global trade have led to shortages and higher prices for imported consumer goods. In 2021, supply disruptions cut 0.5–1.0 percentage-point off global GDP growth but added 1.0 percentage point to core inflation (IMF). The rapidly spreading Omicron variant is expected to further worsen supply-demand imbalances.

Labor Market Distortions

The pandemic has distorted the labor market since living costs have escalated provoking higher labor wage during the pandemic when firms are under production and supply constraints. If labor wages rise, it is like to trigger a wage-price inflationary spiral necessitating aggressive anti-inflationary policy responses.

External Financial Conditions

Limited scope for further expansionary monetary and fiscal policy and inflationary pressure has raised the risks of increased foreign debt burden, for central banks and governments in emerging market and developing economies. Central banks and government are forced to walk on tight rope, delicately controlling inflation and debt burden with limited fiscal space.

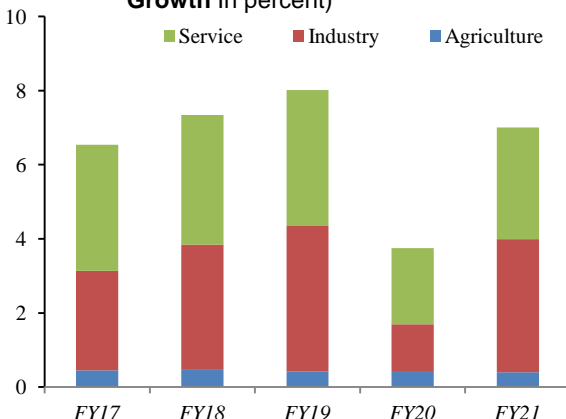
Structural Shifts

Prompted by the pandemic related lockdowns, and social distancing, the global economy has undergone noticeable structural shifts in terms of rapid deployment of digitalization platform, i.e., work-from-home via Internet and e-commerce. Education and training in developing countries suffered the most because of prolonged closure of educational training institutions and prohibition of on-site classes. To mitigate the long-term scarring impacts on the economy, governments need to retool and re-skill workers to enable them for work in a more digitalized economy.

II.1 Economic Activity and Growth Outlook

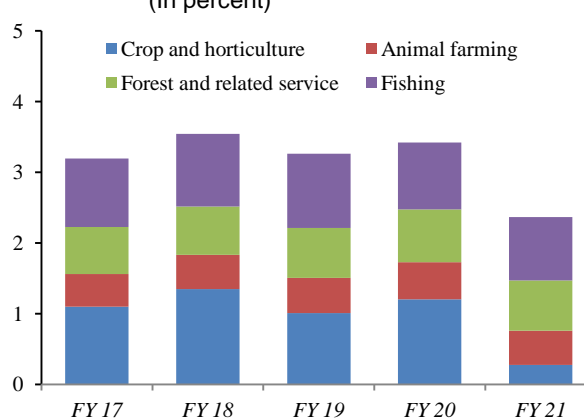
Bangladesh economy has started a promising recovery in FY21, registering real GDP growth of 6.94 percent, after the fallout of the pandemic and subsequent growth slowdown to 3.45 percent in FY20. The slower growth of FY20 was mostly concentrated in the industry sector (3.61 percent) as well as in the service sector (3.93 percent). However, the resilient agriculture sector maintained its average trend, growing by 3.42 percent in FY20. The overall growth performance of FY21 and onwards mainly owed to the supportive monetary and fiscal policies, improved business confidence, effective COVID-19 containment measures and consequent declining infection rate, enactment of mass vaccination across the country, and efficient management of supply chain during the pandemic by the government. The industry sector strongly recovered and grew by 10.29 percent in FY21 after a sharp decline (3.61 percent) in FY20 (Chart II.1). The growth momentum in FY22 appeared to strengthen further, reflected in 16.18 percent growth of large and medium scale manufacturing output during July-October of FY22 compared to the same period of FY21, robust growth of export (28.41 percent), and strong growth in import of intermediate goods (66.21 percent) and capital goods (47.67 percent) during H1FY22.

Chart II.1: Decomposition of Gross Value Addition Growth In percent



Source: Bangladesh Bureau of Statistics (BBS).

Chart II.2: Growth Decomposition: Agriculture (In percent)



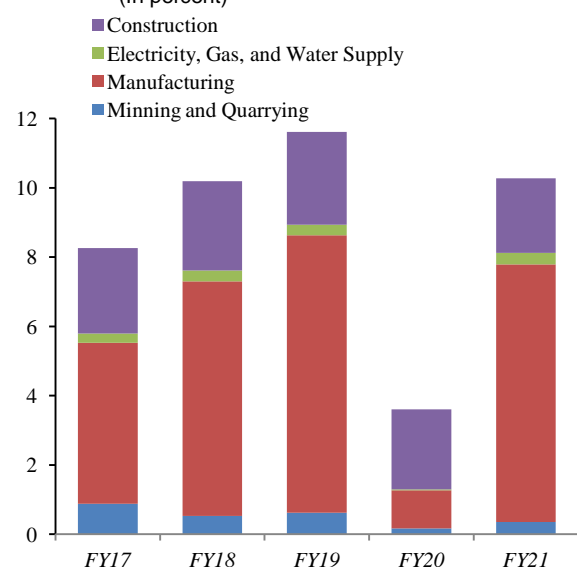
Source: Bangladesh Bureau of Statistics (BBS).

The agriculture sector was not only resilient amid the COVID-induced economic slowdown but also maintained a solid performance in both FY20 and FY21, growing by 3.42 and 3.17 percent respectively. Among major crops, the production of rice, cereal, and potato grew by 5.87, 8.45, and 10.49 percent respectively, while the production of jute and onion declined by 3.97 and 27.76 percent respectively in FY21 compared to FY20. On the contrary, despite a growing demand for wheat in the country, annual production of wheat remained broadly stagnant at around 1.2 MMT. Besides, increased area under cultivation, availability of inputs, proper policy supports, healthy growth momentum in other non-crop sub-sectors and growth of credit to agriculture sector (12.80 percent, year on year) in Q2FY22 will expectedly ensure further traction of this sector in the coming periods.

The growth of the industry sector strongly rebounded to 10.29 percent in FY21 after a slower growth of 3.61 percent in FY20, which could primarily be attributed to conducive policies and relaxation of COVID-19 related containment measures. The growth of manufacturing activities, the main driver of the industry sector, rebounded to 11.59 percent in FY21 compared to 1.68 percent in FY20 (Chart II.3).

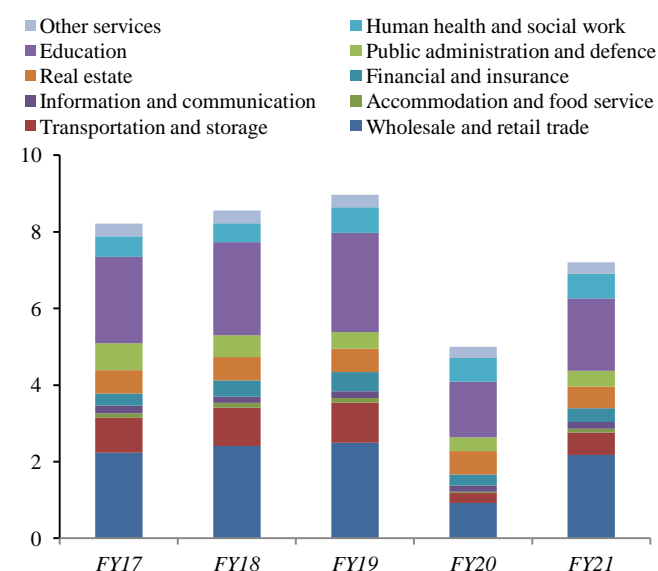
Assessment of the current fiscal year also suggests a pickup in activities in the industry sector, indicated by a noticeable 16.18 percent growth (y-o-y) of the large and medium scale industrial production in the first four months of the fiscal year based on latest available data until October 2021. The growth of manufacturing production was mostly concentrated in the production of food products (5.35 percent), textile (24.71 percent), wearing apparel (26.69 percent), leather and leather products (29.81 percent), pharmaceuticals (15.09 percent), basic metal (23.96 percent), and non-metallic mineral product (11.77 percent). To boost the production and generate employment, government and BB continued with supportive policy measures, including sector specific stimulus packages and various refinance schemes, which resulted in higher growth performance in the targeted sectors in FY21. Facilitated by construction projects from public and private sectors, the construction allied industries of cement and steel maintained healthy growth throughout FY21 and onwards.

Chart II.3: Growth Decomposition: Industry
(In percent)



Source: Bangladesh Bureau of Statistics (BBS).

Chart II.4: Growth Decomposition: Service (In Percent)

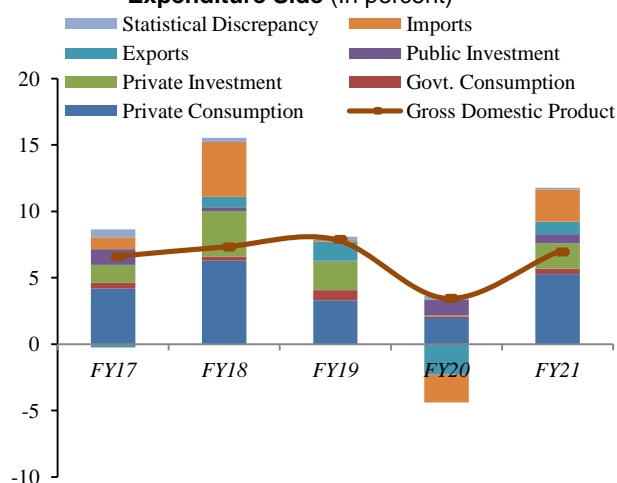


Source: Bangladesh Bureau of Statistics (BBS).

The growth in the service sector activities started rebounding in FY21 and continued regaining momentum in FY22, reflected in several indicators. Within service sector, the major drivers of growth were wholesale and retail trade, transportation and storage, accommodation and food services which grew by 7.64 percent, 4.04 percent, and 4.53 percent respectively in FY21 compared to the growth of 3.21 percent, 1.73 percent, and 1.69 percent respectively in FY20 (Chart II.4). Among other proxy indicators, total cargo handling through Chattogram sea port grew by 12.49 percent during January-December 2021, and credit to trade and commerce and consumer finance grew by 11.39 percent and 11.21 percent at the end of December 2021, compared to the same period last year.

Although the pandemic caused a sharp rise of income risk of households and significant job cut along with doubled extreme poverty², timely policy interventions and progress in the implementation of all supportive policy initiatives helped domestic demand not only to be stabilized and but also to attain a healthy growth of 7.97 percent in FY21 from its pandemic induced slowdown to 3.23 percent in FY20. Among the components of the domestic demand, private investment and consumption have long been the key components as they contributed more than 87 percent and, grew by 7.79 percent and 8.02 percent respectively in FY21 compared to 0.25 percent and 3.00 percent growth respectively in FY20 in real terms. While the domestic demand has been facing headwinds from the negative growth of remittances for the last two quarters, it would revive further as supported by healthy growth of import demand (54.47 percent) during July-December 2021 in one hand. On the other hand, external demand gained momentum with acceleration in export growth of readymade garments at 28.01 in H1FY22.

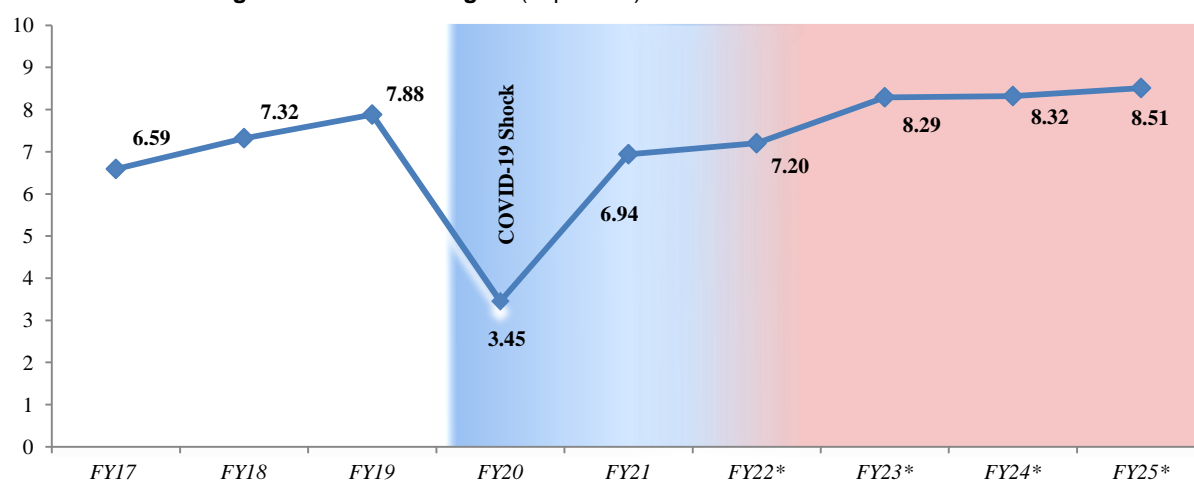
Chart II.5: Decomposition of Real GDP Growth from Expenditure Side (In percent)



Source: Bangladesh Bureau of Statistics (BBS).

While the domestic demand has been facing headwinds from the negative growth of remittances for the last two quarters, it would revive further as supported by healthy growth of import demand (54.47 percent) during July-December 2021 in one hand. On the other hand, external demand gained momentum with acceleration in export growth of readymade garments at 28.01 in H1FY22.

Chart II.6: Real GDP growth rates and targets (In percent)



* Target.

Source: Bangladesh Bureau of Statistics (BBS); Eighth Five-Year Plan, Ministry of Planning.

Going forward, the 7.2 percent real GDP growth target for FY22 and subsequent higher growth targets till FY25 set by the government (Chart II.6) weighing on the strong rebounding trend of the major sectors of Bangladesh economy aided by the implementation of policy initiatives such as stimulus packages, low cost refinance schemes, and policy relaxations, among others. The momentum of the growth performance that became evident in the first half of FY22 is expected to gain further traction in the remaining periods

² Planning Commission, June 2020.

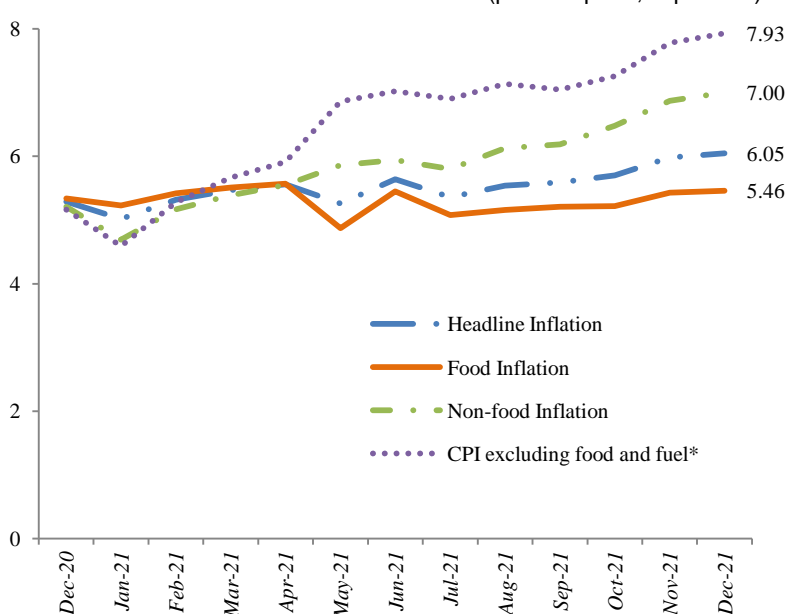
hinging upon strong export growth, supported by returning readymade garment demand from abroad, and a rebound in domestic demand, supported by growing private consumption and rising services activity. Although, large and medium scale industries performed well with government policy supports and stimulus packages, the BB in coordination with government would continue appropriate supports to CMSME sectors to increase employment and production for facilitating the economy to full recovery. Nonetheless, the developments of situation must be observed with caution since the emergence of the highly contagious Omicron variant might weigh on the economy along with other downside risks.

II.2 Inflation Trend and Outlook

Headline CPI inflation (point to point) continued to rise throughout the first half of FY22 as against the decelerated trend in FY21, attributed to a significant increase in non-food inflation. The 12-month average CPI inflation moderated at a slow pace up to October 2021, and then picked up in December 2021. Global food, energy, and non-energy prices remained elevated, although energy prices saw a downturn in November- December 2021. Nominal wages were in an upward trajectory since January 2021, moderated in July-August 2021, and then continued crawling up for the rest of the months. Moreover, recent upward adjustments of administered prices of energy in the domestic economy have created some upward pressure on the prices of non-food commodities to some extent through an increase in production cost and transportation cost.

Headline CPI inflation (point to point) exhibited an upward movement from 5.36 percent in July 2021 to 6.05 percent in December 2021 which was the highest since November 2020. While food inflation was crawled up slowly from 5.08 percent in July 2021 to 5.46 percent in December 2021, non-food inflation showed a substantial hike from 5.80 percent in July 2021 to 7.00 percent in December 2021. Moreover, core inflation, which excludes the influence of food and fuel prices, had showed persistent upward development since February

Chart: II.7 Consumer Price Index Inflation (point-to-point, in percent)



Source: Bangladesh Bureau of Statistics (BBS).

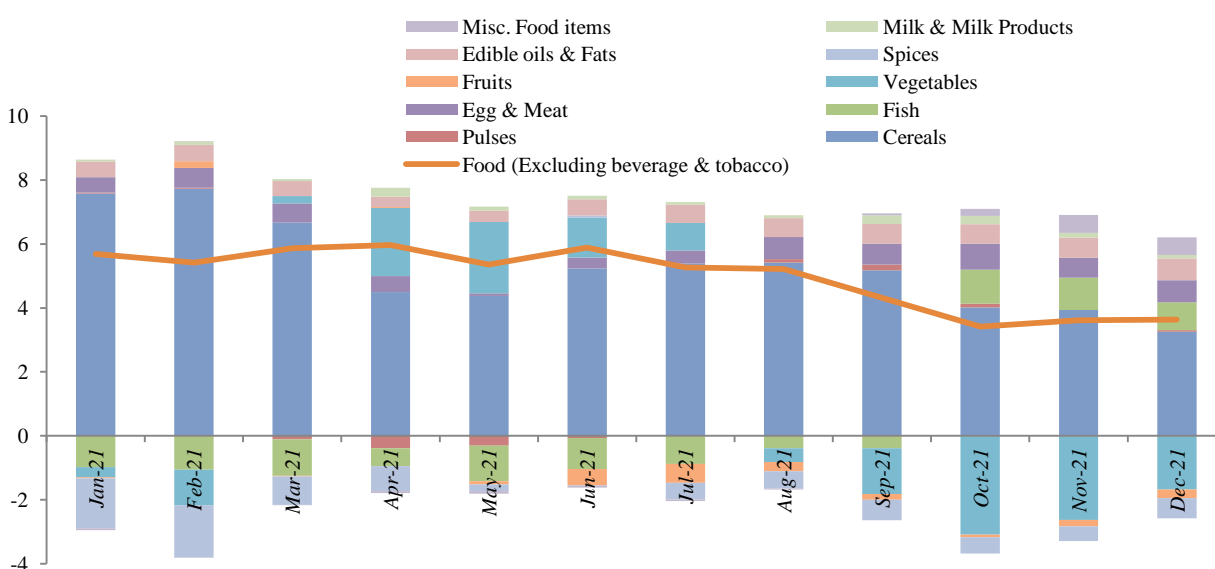
*calculated by Research Department using BBS data.

2021 and increased by 2.65 percentage points to reach 7.93 percent in December 2021 (Chart II.7). The increase in CPI inflation reflects an extended demand compared to supply, picked up global commodity prices, and eased financial conditions.

Decomposition of Food Inflation

The cereals were the highest (3.26 percent) contributor to food inflation. However, the contribution of these items to food inflation declined substantially from 5.89 percent in June 2021 to 3.26 percent in December 2021 (Chart II.8). The contribution of edible oils and fat edged up to 0.69 percent in December 2021 from 0.51 percent in June 2021. Palm oil and soybean oil prices hike in the international markets coupled with supply cut by major exporting countries resulted in higher domestic prices of oils and fats. Fish, eggs, and meat inflation were also increased significantly in H1FY22 reflected in the rise of the contribution of these items in food inflation. On the other hand, the softening of inflation in respect to vegetables, fruits, spices, and pulses aided the easing of food inflation. The contribution of vegetable prices to food inflation turned negative in recent months because of the available supply of winter varieties. Moreover, a similar movement had been evident in rural and urban food inflation with no considerable disparity between year-on-year changes in prices of food and non-food CPI groups.

Chart: II.8 Decomposition of CPI Food Inflation (point-to-point, in percent)



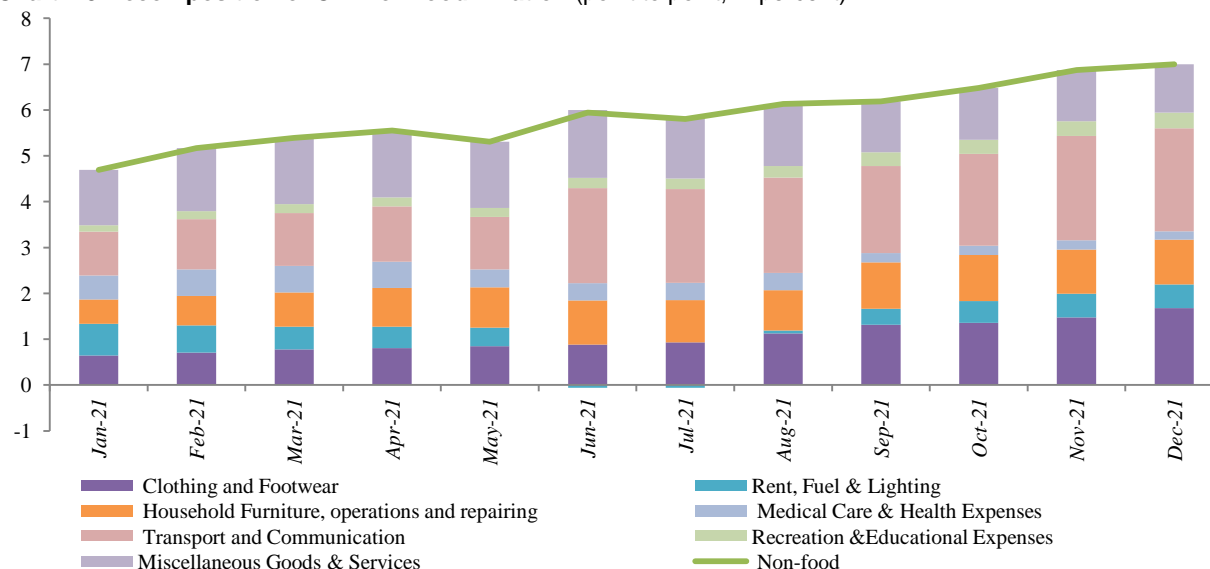
Source: BB Staff's calculation based on BBS data.

Decomposition of Non-food Inflation

Non-food inflation remained elevated during the year 2021 and reached 7.0 percent in December 2021 from 5.21 percent in December 2020 and the recent lowest at 4.69 percent in January 2021. Most of the non-food items of the CPI basket contributed to this uptrend (Chart II.9). Transport and communication, and clothing and footwear products contributed 56.13 percent to non-food inflation in December 2021. Double digit inflation in transport and communication persisted due to additional safety measures taken to prevent the spread of Coronavirus. However, in recent months, transport and communication expenses further intensified because of the upward adjustment in fuel prices. Hence, the contribution of transport and communication to non-food items gradually increased from 0.96 percent in January 2021 to 2.25 percent in December 2021. Clothing and footwear prices also contributed substantially to the inflation build up of non-food items. The contribution of clothing and footwear sector to non-food inflation

gradually increased from 0.88 percent in January 2021 to 1.68 percent in December 2021. As the economy is reopening and the fear of Coronavirus is waning, the mobility of the people reflected in the demand-push cost associated to price hike in the transport and clothes and footwear sectors.

Chart II.9 Decomposition of CPI Non-food inflation (point to point, in percent)



Source: BB Staff's calculation based on BBS data.

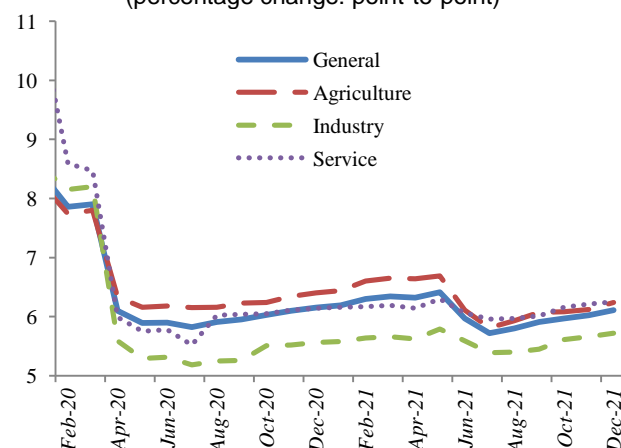
Nominal Wage Rate

The nominal wage rate experienced a sharp fall from 7.90 percent in March 2020 to 6.10 percent in April 2020 due to nationwide lockdown to contain Coronavirus infections. Moreover, the wage rate continued a downward movement till July 2020 and reached 5.82 percent, although the nationwide restrictions ended on 31 May 2020. Since August 2020 wage rate index was moving upward gradually for consecutive eight months from 5.91 percent in August 2020 to 6.34 percent in March 2021, reflecting reopening economic activities. From April-July 2021, the nominal wage rate exhibited some fluctuations owing to movement restriction to subdued Coronavirus infections. However, it began crawling up during August-December 2021 signaling the tightening of the labor market and economic recovery. The wage rate in the agricultural, industrial, and service sectors showed an uptick from 5.81 percent, 5.39 percent, and 5.96 percent in July 2021 to 6.24 percent, 5.72 percent, and 6.25 percent in December 2021 respectively (Chart II.10).

Global Commodity Prices

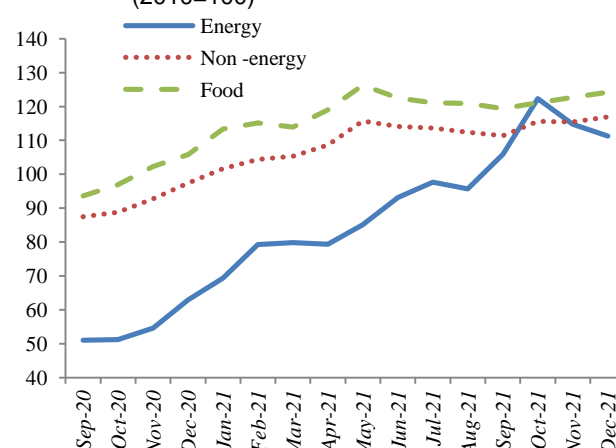
Global energy prices exhibited an uptrend since the beginning of 2021 although showed some downturn in November-December 2021. On the other hand, non-energy prices remained almost sticky in the pre-pandemic level though after January 2021 the index growth (year-on-year) crossed two-digit levels. A similar trend was evident in the world food price index which grew by more than 11 percent in September 2020 and 47.94 percent in May 2021 (the highest since July 2008). Since June 2021 both non-energy and food prices started easing (Chart II.11).

Chart II.10: Wage Rate Index
(percentage change: point-to-point)



Source: Bangladesh Bureau of Statistics.

Chart II.11: Global Commodity Price Indices
(2010=100)

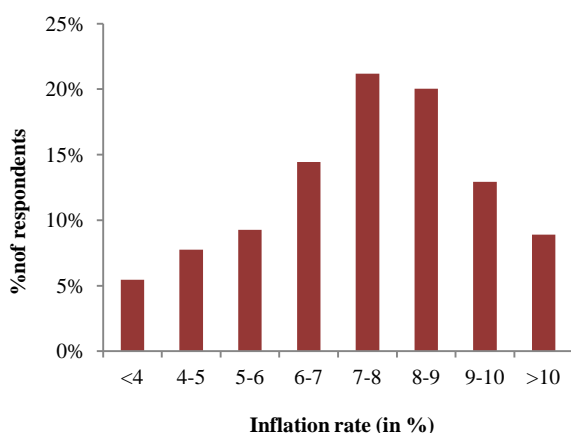


Source: Bangladesh Bureau of Statistics.

Inflation Expectation & Projection

The 12-month average CPI inflation recorded as 5.56 percent in FY21, slightly above the target of 5.4 percent for FY21. Moreover, 12-month average CPI inflation for the first half of FY22 stood at 5.55 percent (government target was 5.3 percent for FY22), while food and non-food average inflation recorded as 5.30 percent and 5.93 percent respectively. Although, 12-month average food inflation are seen to be moving marginally downward from 5.68 percent in July 2021 to 5.30 percent in December 2021, 12-month average non-food inflation increased substantially from 5.33 percent in July 2021 to 5.93 percent in December 2021. Moreover, the 12-month average core inflation, which excludes food, oil, and other volatile commodity prices, kept rising steadily to 6.98 percent in December 2021, indicating rising inflationary pressure. Results of BB's quarterly inflation expectation surveys (Chart II.12) also confirms the upside risks, since around 77.0 percent of the respondents expect one-year-ahead average inflation to be above 6 percent. Moreover, BB's staff projections for the remaining period of 2022 as shown in chart II.13 are also consistent with the inflation expectation survey results.

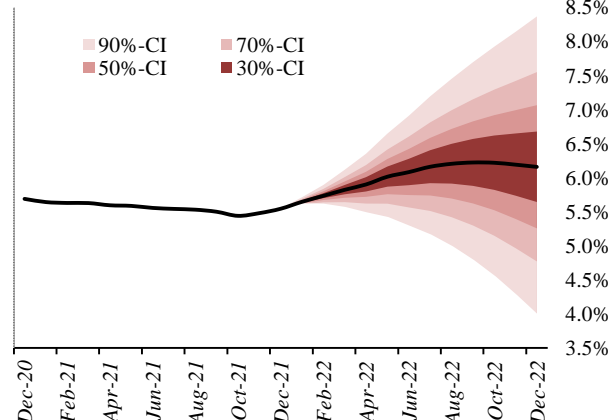
Chart II.12: Distribution of Inflation Expectations*



*One year ahead general inflation.

Source: BB Inflation Expectation Survey, December 2021.

Chart II.13: Projection of Average General CPI Inflation*



*Twelve Month Average Moving Average.

Source: BB staff's calculation based on BBS data.

Looking Forward

According to the Monetary Policy Statement for FY22, the average CPI inflation was projected to be moderated and tolerable at a targeted single-digit rate of 5.30 percent. During the first half of FY22, the actual average CPI headline inflation was slightly above the target (actual 12-month average inflation was 5.6 percent, the target was 5.3 percent). The faster recovery in the international commodity and energy prices signaled inflationary pressures from external sources. Moreover, recent upward adjustments of administered energy prices in the domestic economy have created some upward pressures on the prices of non-food commodities to some extent through an increase in production cost and transportation cost. In addition, inflation expectations may heighten owing to the rising fuel and edible oil price hike. The lagged pass-through to broader inflation from higher food and oil prices for import items might exert further upward pressure on domestic inflation. Additional risks might evolve from the external sector as domestic currency is depreciating rapidly. Moreover, the recent uptick in the asset price index, especially the stock price index and real estate price index may further exacerbate the upside-risk of inflation. However, Bangladesh Bank will remain cautious regarding inflation developments and will ensure prudent monetary management to contain the price stability.

III.1 Balance of Payments (BOP)

External sector showed a mixed performance in H1FY22 compared to that of the corresponding period of previous year, reflected in an uptrend of export earnings, a faster pace of imports payment and a falling trend in remittance inflows. Current account (CA) recorded a deficit of USD 8.2 billion during H1FY22 compared to a surplus of 3.5 billion during H1FY21 because of a negative remittance growth of 21.0 percent, and widening trade deficit stemmed from faster import growth than export. Financial account reached USD 6.7 billion during H1FY22 from USD 2.2 billion in H1FY21, dominated by a larger medium and long-term loan (MLT) (USD 4.03 billion), higher inflows of net FDI (USD 0.87 billion), and increasing net aid flows (USD 3.2 billion). Overall balance of payments (BOP) registered a deficit of USD 1.79 billion in H1FY22 in contrast to the surplus of USD 6.16 billion in H1FY21 because of a large current account deficit.

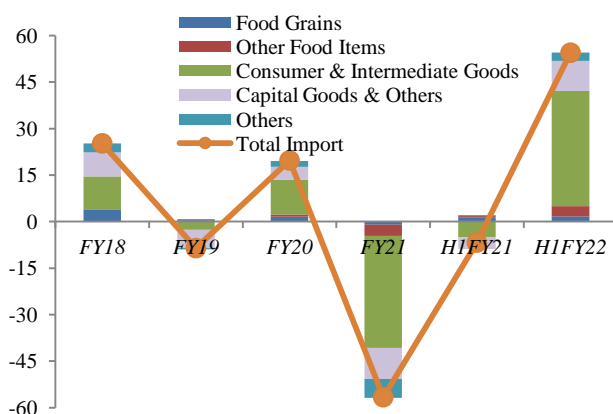
III.1.1 Export

After rebounding in H1FY21, export earnings continued its upward trend during H1FY22 as external demand picked up arising from recovery of global activities. During H1FY22, export performance was 15.5 percent higher than the target set by Export Promotion Bureau (EPB). Export earnings stood at USD 24.7 billion in H1FY22, which was 28.4 percent higher than USD 19.2 billion during the same period of the previous year, supported by 28.0 percent growth in RMG exports. The major contribution (80.1 percent) of export earnings came from knitwear (grew by 30.9 percent) and woven garments (grew by 24.5 percent), reflecting the reopening of major export destinations like the EU and USA after massive vaccination. Among the export categories, export of engineering products (67.9 percent), chemical products (56.8 percent), plastic products (34.2 percent), leather and leather products (26.4 percent), home textiles (30.8 percent), agricultural product (24.6 percent), frozen and live fish (21.2 percent) increased during the period under review.

III.1.2 Import

Resumed import demand in H2FY21, gained momentum during H1FY22 underpinned by the reopening and revitalization of economic activities as extension of vaccination coverage continued. The import-payments increased significantly by around 54.5 percent to USD 39.0 billion during July- December of FY22 compared to USD 25.2 billion in the same period of FY21 geared by payments of intermediate goods including raw cotton, yarn, and textile. Hence, the

Chart III.1: Decomposition of Import Growth



Source: BB staff's calculation based on NBR data.

current import scenario reflected a strong domestic demand which is also evident by higher private credit growth.

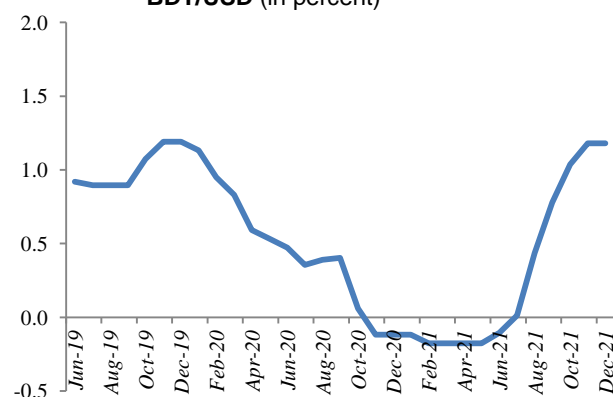
III.1.3 Remittance

Remittance inflows declined by 20.9 percent to USD 10.2 billion in H1FY22 from USD 12.9 billion in H1FY21 partly reflecting diversion of people's tendency to informal remittance channels after re-opening from the lockdowns. As a result of the second wave of the COVID-19 pandemic, many Bangladeshi migrants lost their jobs; some left their business, while many of them returned home and were unemployed. After gradual relaxations of global movement restrictions, number of migrant workers started to increase since July 2021 and increased by 373,392 during H1FY22 as compared to 36,451 during H1FY21. Despite cash support to wage earners aimed at encouraging remittance inflows through formal channels in addition to an increase in manpower export during H1FY22, remittance inflows declined in the period under review. Whereas in FY21, robust remittance inflows was driven by some underlying reasons like-high consumption demand of household, highly depending on formal transfer channels which might induced a short-time rise in remittance inflows. Recently, government raise cash incentives to remitters from 2 percent to 2.5 percent in the view of encouraging transfer money from abroad through banking channel.

III.2 Exchange Rate Movement

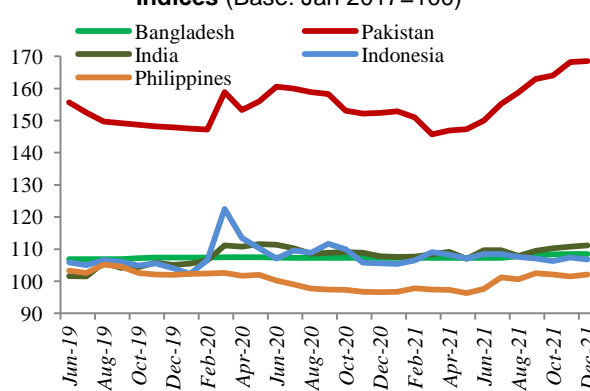
In line with the development of external sectors, exchange rate dynamics reflected some market forces which allowed the Taka against USD to depreciate by 1.16 percent (y-o-y) at the end of December, 2021 (Chart III.2). To avoid excessive volatility BB continued its intervention in the foreign exchange market by net selling of USD 2.27 billion during the period under review. On the other hand, in H1FY21, Bangladesh Bank purchased net amount of USD 5.3 billion to intervene forex market, thanks to hefty remittance inflows. However, foreign exchange reserve piled up to USD 46.2 billion at the end of December, 2021 which enough to cover the potential import of 6.0 months. Nonetheless, in comparison with the peer countries such as Pakistan, India, Indonesia, and Philippines, Bangladesh observed less volatility in the exchange rate during H1FY22 as shown in Chart III.3.

Chart III.2: Change in Nominal exchange rate- BDT/USD (in percent)



Source: Statistics Department, Bangladesh Bank

Chart III.3: Cross-Country Nominal Exchange Rate Indices (Base: Jan 2017=100)



Source: International Financial Statistics, IMF.

Given the recent movement in Taka against the US Dollar, the shifts in major currencies movement and the inflation in the trading partners countries, NEER and REER appreciated by 2.44 and 4.17 percent (y-o-y) respectively at the end of December 2021.

Table 3.1: Foreign exchange market intervention by Bangladesh Bank

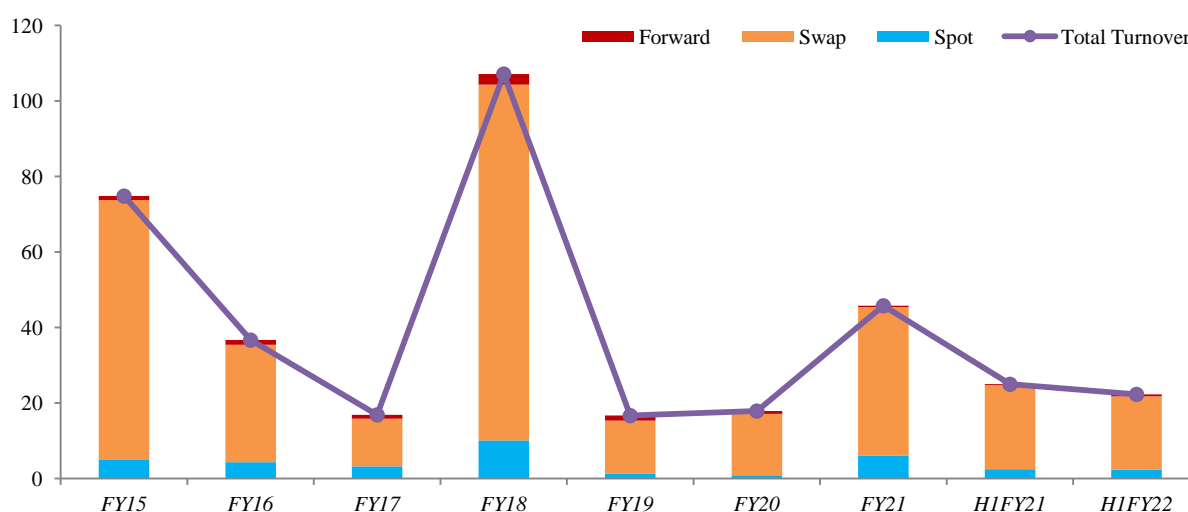
Years	Buy (million USD)	Sell (million USD)	Net Buy (million USD)	Local Currency (billion BDT)
FY12	157	776	-619	-51
FY13	4539	0	+4539	+353
FY14	5150	0	+5150	+400
FY15	3758	357	+3401	+265
FY16	4131	0	+4131	+324
FY17	1931	175	+1756	+142
FY18	0	2311	-2311	-194
FY19	0	2339	-2339	-198
FY20	877	835	+42	+4
FY21	7937	235	+7702	+653
FY21 (July-December)	5491	200	+5291	+449
FY22 (July-December)	210	2483	-2273	-194

Source: Forex Reserve & Treasury Management Department, Bangladesh Bank.

Note: (-) refers to the shrinking of liquidity and (+) indicates increased liquidity

The total turnover in the foreign exchange market of Bangladesh declined by 10.73 percent and stood at USD 22.3 billion during H1FY22, mainly from Swap transactions (having a share of 87.0 percent), compared to USD 25.0 billion in H1FY21. However, the total turnover increased by 155.64 percent to USD 45.8 billion in FY21 from USD 17.9 billion in FY20, dominated by SWAP transactions (holding 86.16 percent), while Spot transactions having a share of 13.10 percent in FY21 (Chart III.4).

Chart III.4: Total Turnover by Instruments (In billion USD)



Source: Bangladesh Bank

Box 1: BB's Recent Policy Initiatives for External Sector Developments

Raise Cash incentives: the government raised existing cash incentive on wage remittance to 2.5 percent from 2.0 percent encouraging remittance inflows through banking channel. Producer-exporter will be given 4.0 percent incentives on net FOB price in case of exporting own garden produced tea, own factory produced bi-cycle and its parts, own factory produced MS Steel Products, own factory produced cement sheets.

Inward remittances on account of refund against import payment: Refund against non receipt/short receipt of goods from supplier as per LC/Contract/IMP may be settled by inward remittances from the legitimate sources irrespective of supplier through banking channel subject to observation of several instructions.

Remittance on account of bonus by foreign nationals working in Bangladesh: Foreign nationals can remit up to 75.0 percent of their bonus after deduction of applicable taxes and payment thereof at one-go without spreading over the subsequent 12 months.

Liberalization of family remittance facility for foreign nationals working in Bangladesh: Foreign nationals who are resident in Bangladesh and have income in Bangladesh are permitted for monthly remittances up to 75 percent of their net income. They are also allowed to transfer abroad their genuine savings out of salaries/benefits at the time of leaving Bangladesh permanently after expiry of period of service.

Outward remittances on account of IT expenses through digital wallet: ADS may release IT expenses within the limit of USD 500 on behalf of individual developers/freelancers through their notional accounts (digital wallet) maintained with Online Payment Gateway Service Providers (OPGSPs) in accordance with FE Circular.

Outward remittances on account of shipment tracking charges: Authorized Dealers (ADS) may remit their own subscriptions to international financial news/transactions service providers. Circular also permits ADs to remit their charges payable to foreign banks. In the context of international trade, ADs support importers and exporters to execute the transactions for which they need to avail shipment tracking services from global service providers to be satisfied with the underlying transactions.

Outward remittance for payment of subscription fees for local distribution of satellite: To facilitate the payment of receiving satellite channels through newly evolved DTH (Direct to Home) technology, it has now been decided that Bangladesh Bank will also consider applications from ADs on behalf of their customers for remitting subscription fees abroad.

Reporting of Shipping Information in Online Export Monitoring System (OEMS) and Online Import Monitoring System (OIMS): Bangladesh Bank introduced Online Foreign Exchange Transaction Monitoring and Management System (FX Dashboard) including two separate modules, namely Online Export Monitoring System (OEMS) and Online Import Monitoring System (OIMS) for proper management and monitoring of export and import related information and transaction. Both Systems have been integrated with the ASYCUDA World System of Bangladesh Customs over time and relevant data exchange automatically.

III.3 Outlook of External Sector

With a steep fall in remittance inflows and escalation of import payments for various infrastructure projects of government along with upward trend in global food and oil prices, it would be a challenging task to tie up the deficit in current account balance in near future. However, current account balance may improve if export earnings continue to rebound on the back of continued global economic recovery in the near term. Restoring macroeconomic resilience might attract FDI inflows, which, in turn, will boost financial inflows. Higher financial inflows which increased continuously in last several quarters may increase further in the coming periods and will help somewhat to reduce the deficit of overall balance of payment (BOP).

Although foreign exchange reserve buffer is currently adequate to meet the potential import payments underpinned by strong export earnings together with sizeable financial inflows, downside risks may arise from declining remittance inflows and rising trend in prices of commodities in international markets. However, Bangladesh Bank made a forecast that the remittances inflows is expected to reach USD 29.734 billion in 2022, growing at 20.0 percent. Raise in government cash incentives on remittance inflow to 2.5 percent from 2.0 percent and depreciation of taka against USD might support the more remittance inflows through formal channels. In addition, remittance inflows from the GCC countries may increase again as higher global oil prices aided economic recovery of GCC countries. However, new COVID variant in major export destinations may pose some downside risk in external sector outlook.

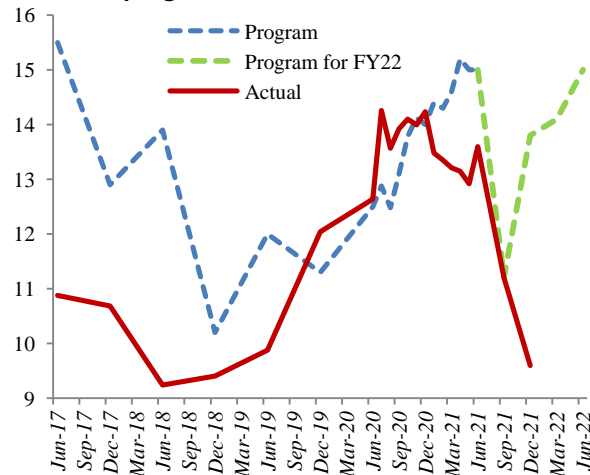
IV.1 Development of Broad Money (M2)

The broad money (M2) growth followed a falling trend in the first half of FY22, decelerating gradually from 13.60 percent in FY21 to 9.60 percent in H1FY22, which was much below the target of 13.80 percent at end H1FY22 (Chart IV.I). This decline of M2 growth was contributed by lower-than-expected growth in both net foreign asset (NFA) and net domestic asset (NDA). Although the growth of NDA remained below the target of 14.05 percent for December 2021, it accelerated to 11.57 percent in December 2021 from 9.49 percent in June 2021, driven by both rebounding of the growth in credit to private sector and soaring credit to the public sector,

mainly to the government. Credit to the public sector rose by 21.00 percent in December 2021 compared to 19.34 percent in June 2021 on the back of a notable decline in sale of national saving certificates (47.36 percent during July-November 2021). Against the target of 11.00 percent for December 2021, the growth of credit to the private sector continued gaining momentum and reached 10.68 percent in December 2021 from 8.35 percent in June 2021, aided by recovery of aggregate demand on the one hand and prevailing low cost of credit on the other. Year on year available data show that bank credit growth to trade & commerce, construction, and agriculture sectors increased by 11.39 percent, 9.00 percent, and 12.80 percent at the end of December 2021. Therefore, overall activities suggest that the growth of credit to the private sector will strengthen further and is expected to reach the yearly target of 14.8 percent by the remaining months of FY22, hinging upon the regaining of growth momentum in the real sector.

On the other hand, after showing buoyancy during FY21, NFA growth started moderating since June 2021 and came down to 3.41 percent in December 2021 against the target of 13.01 percent as on December 2021. The slowdown of NFA growth was originated mostly by a sharp decline in the growth of remittance inflows and widening of negative trade balance. The growth of remittance inflow witnessed a precipitous fall of 20.91 percent during July-December 2021, compared to the same period last year. Although export experienced impressive growth of 27.25 percent during H1FY22, a high 54.49 percent import growth during the same period put pressure on the overall BOP to some extent. However, the strong external demand and government's recent policies such as increasing the incentive rate for remittance inflows and depreciation of BDT against USD will impact the NFA growth positively towards achieving its FY22 target by the remaining period.

Chart IV.1: Broad money (M2) growth (in percent): program vs. actual



Source: Bangladesh Bank.

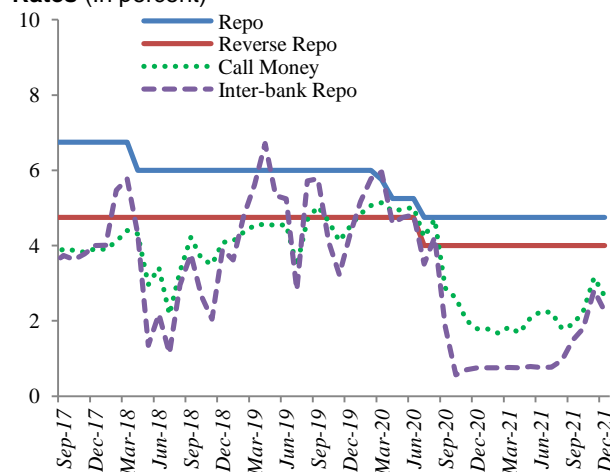
IV.2 Development of Reserve Money

The growth rate of reserve money (RM) decelerated to 6.45 percent in December 2021, remaining below the target of 14.00 percent growth for December 2021 and 10.00 percent for June 2022. This slow growth of RM was originated mainly from contraction of the growth of NFA of BB in the face of growing current account deficit. The growth of NFA of BB declined to 3.94 percent in December 2021 from 28.27 percent in June 2021. However, money multiplier substantially increased to 5.01 at the end of December 2021 from 4.48 at the end of June 2021 because of a decline in both currency-deposit ratio and reserve-deposit ratio.

IV.3 Development of Policy Rates and Interest Rates

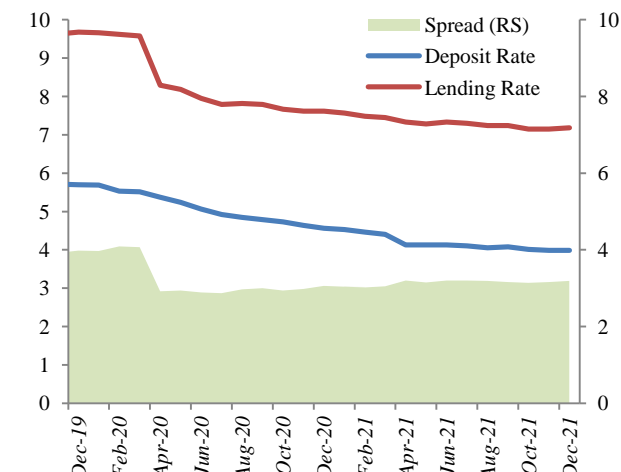
Following the expansionary and accommodative monetary policy stance, Bangladesh Bank has been maintaining low policy rates in response to the pandemic for ensuring sufficient liquidity in the banking system and easy access to finance aimed at economy's broad-based recovery and normalization. Therefore, so far, cash reserve ratio (CRR) and bank rates remained unchanged at 4.00 percent and repo and reverse repo rates remained at 4.75 percent and 4.00 percent, respectively since July 2020. On the other hand, both interest rate in the call money market and interbank repo rate showed increasing trend in H1FY22 on the back of liquidity mop-up measures of BB as well as downward movements of the growth of total deposits in the banking system during this period, although both the rates moderated somewhat in December 2021 (Chart IV.2).

Chart IV.2: Movements in Policy and Money Market Rates (In percent)



Source: Bangladesh Bank.

Chart IV.3: Interest Rate Spread (In percent)

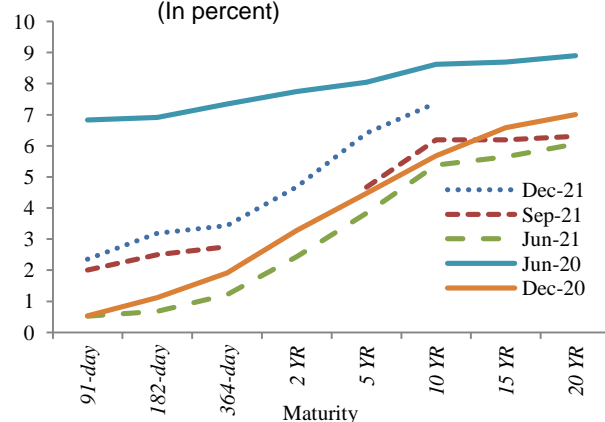


Source: Bangladesh Bank.

However, weighted average interest rates in the retail market continued the downward trend till December, 2021 in the face of sufficient liquidity in the banking system as well as ample low-cost refinance schemes for the priority sectors. Weighted average lending and deposit rates decreased from 7.33 percent and 4.13 percent in June 2021 to 7.18 percent and 3.99 percent in December 2021, respectively (Chart IV.3). Weighted average yields on government securities for all medium- and long-term maturities started rising since September 2021 and observed further upward shift in December 2021,

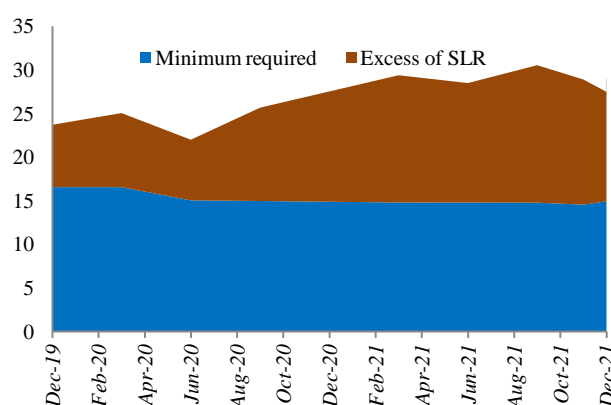
reflecting strength of future growth prospect. The yields on 91-day, 182-day, and 364-day treasury bills nudged up to 2.36, 3.19, and 3.44 percent in December 2021 from 0.52, 0.68, and 1.21 percent in June 2021, respectively. Likewise, yields on 5-year and 10-year treasury bonds picked up to 6.41 and 7.38 percent from 3.84 and 5.38 percent, respectively, at the same time. Although 15-year and 20-year treasury bonds were not traded in December 2021, their weighted average yields picked up in November 2021 compared to June 2021 (Chart IV.4).

Chart IV.4: Yields of Government Securities
(In percent)



Source: Bangladesh Bank.

Chart IV.5: Liquidity as percent of TDTL



Source: Bangladesh Bank

IV.4 Liquidity and Outlook

To prevent the siphoning off bank credit to any undesirable use and reduce domestic inflationary risk that might emerge from the prevailing liquidity glut in the banking system amid the wake of corona virus infection, BB, so far, mopped up some excess liquidity from the banking system during H1FY22. On the other hand, a pickup in the growth of credit to the private sector also contributed to reduce excess liquidity. Consequently, the ratio of total liquid assets and liquid asset excess of SLR to total demand and time liabilities (TDTL) reduced to 28.58 percent and 13.83 percent at the end of December 2021 from 30.55 percent and 15.76 percent at the end of June 2021, respectively (Chart IV.5).

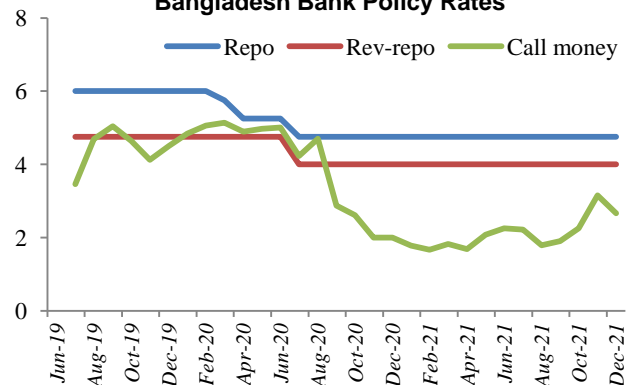
Looking forward, despite shortfall from the targets for private sector credit growth and overall development of broad money, the BB is expected to gain traction over the indicators relying upon the favorable seasonal factors. BB's policy is to channel the funds efficiently to the productive sectors, including agriculture, CMSMEs, export-oriented industries and the informal sector, which have been hit hard by the pandemic. Providing utmost efforts of supply of credit to productive and manufacturing sectors would help faster recovery of economic activities in achieving the growth target for FY22, while containing inflationary pressure in the near future.

During the first half (H1) of FY22, overall domestic financial markets remained vibrant and resilient amidst the second wave of the COVID-19 pandemic, reflected in easy liquidity and movements in the rates of money, foreign exchange, securities market. Bangladesh Bank contributed well to stabilize the financial market through an expansionary and accommodative monetary policy stance in FY21 and FY22. These easy monetary conditions helped maintain financial stability for a balanced financial market. During FY21 and H1FY22, BB's various initiatives such as easy liquidity access to the banking system, maintaining balanced and competitive foreign exchange rates, watchful monitoring, and careful supervision helped to preserve financial markets' harmony in the financial market of Bangladesh. In this regard, the BB used necessary policy tools throughout FY21 and H1FY22 to maintain enough liquidity in the money market which contributed to sustain a well-performing and sound financial system in Bangladesh amidst the ongoing COVID-19 pandemic.

V.1 Money Market

The money market of Bangladesh remained stable in H1FY22 mainly because of timely initiative of the Bangladesh Bank. The BB continuously used the monetary and government debt management tools in H1FY22 to maintain adequate liquidity for supporting the money market. During H1FY22, the repo and reverse repo rate remained unchanged and the weighted average call money rate witnessed an upward trend compared to the same period of previous fiscal year. But at the same time, the BB used BB

Chart V.1: Movements of Call Money and Bangladesh Bank Policy Rates



Source: Monetary Policy Department, Bangladesh Bank.

bills and treasury bills, mopping up excess liquidity from the money market for maintaining price stability and optimum liquidity. Previously, the Repo and Reverse Repo rate cut down to 4.75 and 4.00 percent respectively from 5.25 and 4.75 percent, in FY21 which contributed to lower the weighted average interest call money rate significantly (Chart V.1). Moreover, the weighted average yield of treasury bills decreased in FY21 compared to that of FY20, supported by easy liquidity for the money market.

The BB has taken various policy measures for sustaining private sector credit growth and maintaining sufficient liquidity, following easier monetary policy rates during H1FY22 to overcome the adverse impact of the pandemic. The weighted average call money rate maintained a quite upward trend while the repo and reverse repo rate remained unchanged during H1FY21 (Chart V.1). The monthly average trade volume marginally increased to BDT 1272 billion in H1FY22 from BDT 1246.46 billion in H1FY21. Consequently the weighted average call money interest rate increased to 2.66 percent in December 2021 from 2.25 percent in June 2021 mainly due to significant growth in private sector credit demand. During

FY21, the BB slashed repo and reverse repo rates to maintain surplus liquidity and balance in the interbank call money market. Due to the easy monetary policy rates, surplus liquidity increased to BDT 2315 billion at end June 2021 compared to BDT 1396 billion at end June 2020. The adequate surplus liquidity helped decline the weighted average interest rate in the call money market ranging from 5.01 percent in June 2020 to 2.25 percent in June 2021. The monthly average trade volume in the interbank markets was declined by 13.1 percent to BDT 1029.08 billion in FY21 from BDT 1184.42 billion in FY20.

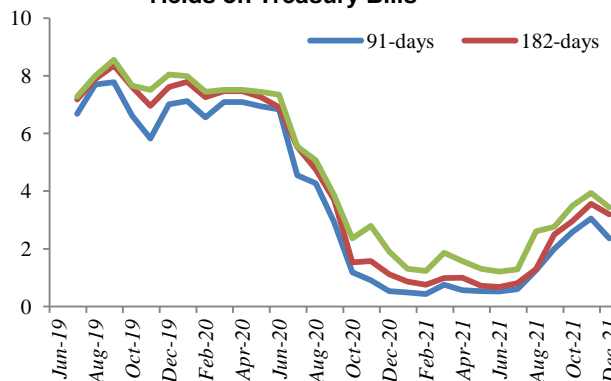
Table 5.1: Volume of Trade and Weighted Average Interest Rates in Call Money Market, July-December 2021

Period	Volume of Trade (In BDT Billion)	Weighted Average Interest Rate (%)
July	468.18	2.22
August	936.65	1.79
September	1642.29	1.90
October	1731.56	2.25
November	1549.37	3.15
December	1303.99	2.66
Monthly Average	1272.0	

Source: Monetary Policy Department, Bangladesh Bank

The treasury bills are the short-term instrument for government debt management and indirect monetary policy tools which are used for liquidity management in the money market. There are three treasury bills instruments such as 91-day, 182-day, and 364-day. In June 2021 yield rate on 91-day, 182-day, and 364-day treasury bills substantially declined to 0.52 percent, 0.68 percent and 1.21 percent respectively from 6.83 percent, 6.91 percent and 7.35 percent respectively in June 2020. The easy monetary policy was the main contributor for

Chart V.2: Movements of the Weighted Average Yields on Treasury Bills



Source: Bangladesh Bank.

the lower treasury bills yields in FY21 which was reflected in the surplus liquidity in the money market. However, during H1FY22, the weighted average yield of all T-bills started to increase as the BB started to mop up excess liquidity from the money market with an objective of ensuring price stability. The excess liquidity stood at BDT 2165 billion as of the end of December 2021 which was significantly lower than BDT 2315 billion at the end of June 2021. Consequently, in December 2021, yield rate on 91-day, 182-day, and 364-day treasury bills substantially increased to 2.36 percent, 3.19 percent and 3.44 percent respectively from 0.52 percent, 0.68 percent and 1.21 percent in June 2021. Moreover, the outstanding amount of treasury bills increased to BDT 621.46 billion in H1FY22 against BDT 521 billion in FY21. On the other hand, the outstanding T-bills decreased by 21.3 percent to BDT 521.00 billion in FY21 compared to BDT 662.00 billion in FY20. In addition, the number of offered bids was 4259 amounting to

BDT 3512.51 billion while that of the accepted bids was 1118 amounting to BDT 1125.00 billion (including BDT 25.65 billion devolvement on BB) in FY21.

Table 5.2: Number of Auction bids and outstanding of Government Treasury Bills, H1FY22

Tenor of bills	Number of Bids		Outstanding bills as of end December 2021 (In billion BDT)	Weighted Average Yield
	Offered	Accepted		
14-days	0	0	0.00	0.00
91-days	1073	263	195.98	0.45-3.24
182-days	511	127	138.66	0.70-3.78
364-days	580	158	286.82	1.16-3.98
Total	2164	548	621.46	

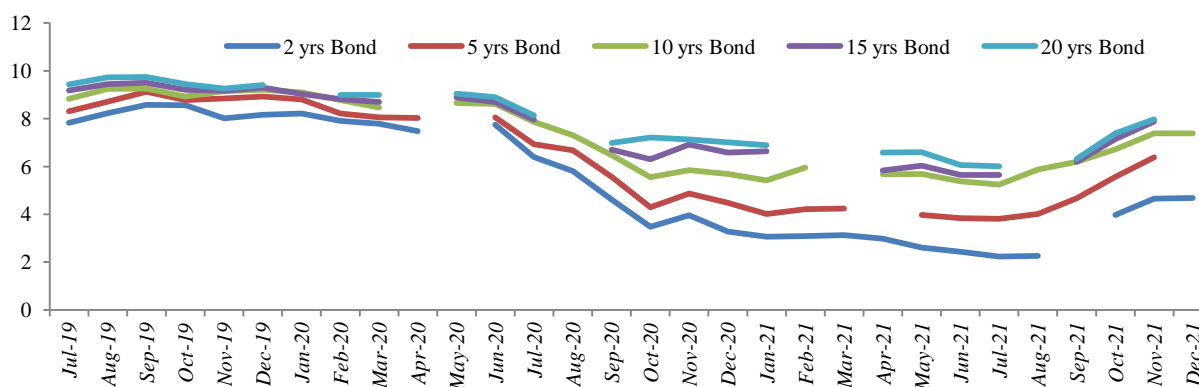
Source: Bangladesh Bank

V.2 Governments Securities Market

The government securities Market of Bangladesh consists of two instruments, treasury bills and treasury bonds. The BB used these instruments to manage the government budget deficit financing and control liquidity in the money market. The weighted average yield of government treasury bonds showed an upward movement during H1FY22 because of the higher demand for government domestic borrowing from the banking system. Also the first half of FY22, BB took the initiative to mop up extra liquidity from the money market with an objective of price stability. However, the government treasury bond market experienced decreasing trend for weighted average yields, the number of auction bids and outstanding bonds in FY21 compared to that of FY20. Moreover, the BB slowed liquidity sterilization effort in FY21 through the long-term instruments considering the pandemic recovery situation.

The weighted average yield on 2-year, 5-year, 10-year, 15- year and 20-year bonds increased to 4.66 percent, 6.38 percent, 7.39 percent, 7.84 percent and 7.98 percent respectively in November 2021 from 2.44 percent, 3.84 percent, 5.38 percent, 5.65 percent and 6.06 percent in June 2021 (Chart V.3).

Chart V.3 : Yields on Bangladesh Government Treasury Bonds



Source: Bangladesh Bank

However, the weighted average yield on 2-year, 5- year, 10-year, 15- year and 20-year bonds decreased to 2.44 percent, 3.84 percent, 5.38 percent, 5.65 percent and 6.06 percent respectively in June 2021 from 7.75 percent, 8.05 percent, 8.62 percent, 8.69 percent and 8.9 percent in June 2020. During July-December FY21, the total number of offered auction bids was 1887 for government treasury bonds while

the number of accepted bids was 841 and the outstanding bonds was BDT 2884.43 billion (Table 5.3). Government collected money from Islamic Sukuk bonds in H1FY22 and the amount of the outstanding bonds increased BDT 50 billion and stood at BDT 130.00 billion in this period. The outstanding amount of government treasury bonds increased by 23.57 percent to BDT 2679.18 billion at the end of June 2021 from BDT 2168.18 billion at the end of June 2020.

Table 5.3: Number of Auction bids and outstanding bonds of BGTB, H1FY22

Tenor of bonds	Number of Bids		Outstanding bonds as of end June 2021 (In billion BDT)
	Offered	Accepted	
2-Year	263	102	432.22
3-Year	0	0	5.00
5-Year	415	249	637.63
10-Year	547	271	941.65
15-Year	332	109	451.16
20-Year	330	110	416.77
Total	1887	841	2884.43

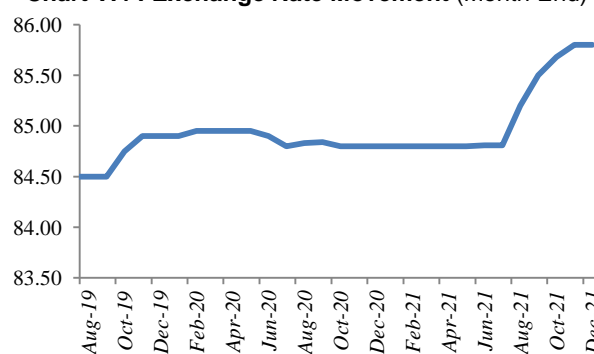
Source: Bangladesh Bank

V.3 Foreign Exchange Market

Effective management of foreign exchange market is very important to achieve tolerable inflation and a desired level of economic growth for a country. The BB, being the regulator of the banking and financial systems in the country, has been taking various steps to strengthen its close monitoring of the daily activities of the financial institutions and adopt necessary measures for creating and sustaining the momentum in the country's foreign exchange market. The apparent stability of BDT against US dollar in the foreign exchange market had been experienced over the last couple of fiscal years. In the H1FY22, the depreciation pressure on exchange rate of BDT against the US dollar entailed improvement in competitiveness of Bangladeshi export in term of large difference between REER based exchange rate and nominal exchange rate. However, the depreciation pressure on exchange rate of BDT against US dollar was eased partly by BB's US dollar sales from reserve to limit inflationary consequences of excessive BDT depreciation. Bangladesh's foreign exchange market experienced depreciation of Taka against the US dollar at end December 2021 compared to that of at end June 2021 due to the huge import payment pressure in this period. However, during FY21, the exchange rate of Taka against USD marginal appreciated.

The Exchange rate of Bangladeshi Taka started to depreciate from August 2021 and stood at BDT 85.80 at the end of December 2021. At the end of December 2021, the exchange rate depreciated by 1.16 percent as compared to its level at the end of June 2021 (Chart V.4). However, during FY21, the exchange rate of BDT appreciated slightly by 0.11 percent against the US dollar compared to 0.47 percent depreciation in FY20. The Exchange rate of Bangladeshi Taka stood at

Chart V.4 : Exchange Rate Movement (Month End)

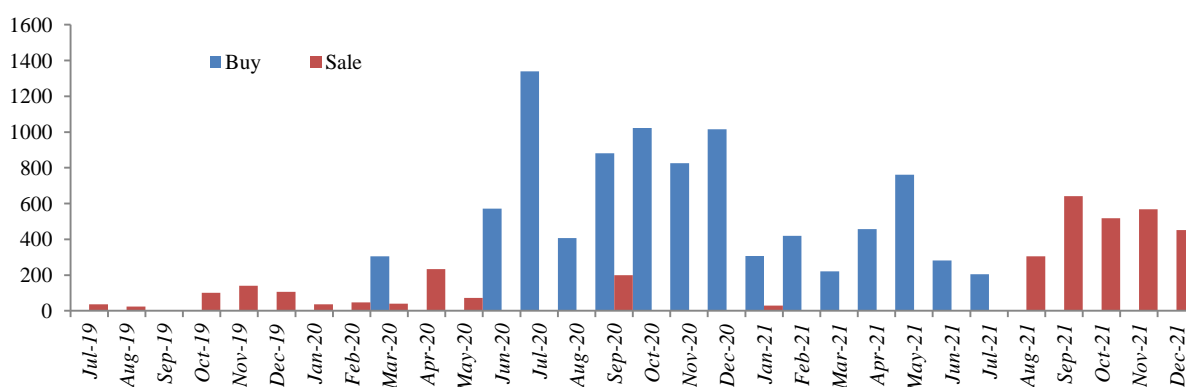


Source: Bangladesh Bank.

BDT 84.81 as of the end of June 2021 compared to BDT 84.90 as of the end June 2020 (Chart V.4).

The lower inflow of remittances and higher import payments created pressure on the foreign reserve which led to the depreciation of Bangladeshi Taka. To stabilize the foreign exchange market, Bangladesh Bank intervened in the foreign exchange market with a total sale of USD 2483.00 million during H1FY22 (Chart V.5). However, the net sale of the foreign exchange market was USD 2273.00 million in H1FY22. During FY21, BB bought a huge amount of foreign currency which was USD 7937 million while the total amount of sales was USD 235 million (Chart V.5).

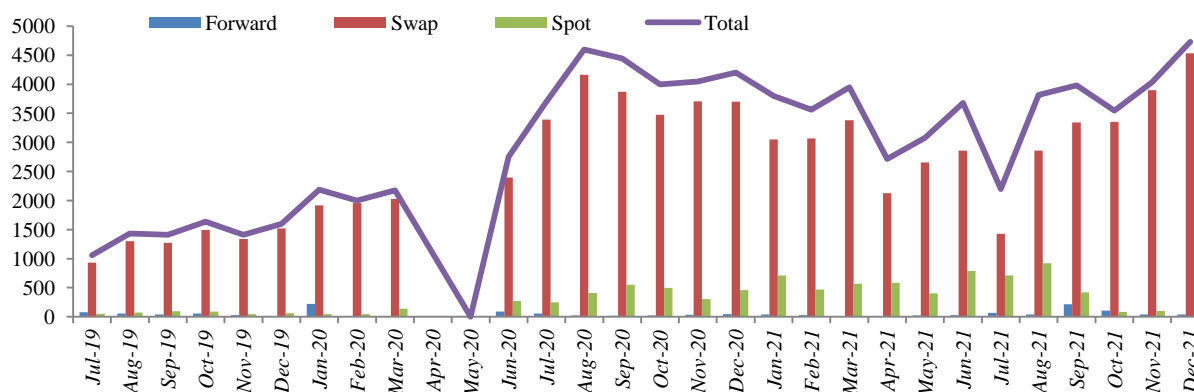
Chart V.5: Foreign Exchange Market Intervention by Bangladesh Bank (In Million USD)



Source: Bangladesh Bank

Total inter-bank foreign exchange transactions involving USD/BDT Spot transactions, Swap transactions, USD/BDT and forward transactions increased by 159.24 percent to USD 45.78 billion in FY21 from USD 17.66 billion in FY20. The volume of swap transactions in total inter-bank transactions increased by 144.13 percent in FY21 (USD 39.44.52 billion) as compared to FY20 (US 16.16 billion) to meet short-term demand for currency. The volume of Spot transaction also increased by 559.79 percent during FY21 (USD 6.0 billion) compared to FY20 (USD 0.91 billion). However, the volume of forward transaction decreased by 43.38 percent during FY 21 (USD 0.34 billion) compared to FY 20 (USD 0.59 billion).

Chart V.6: Foreign Exchange Market Transaction (In Million USD)



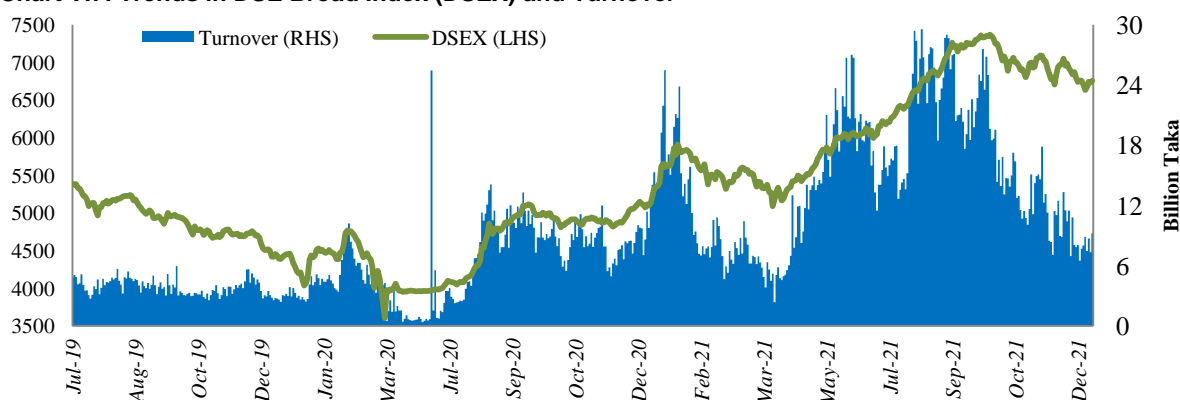
Source: Bangladesh Bank

Moreover, total inter-bank foreign exchange transactions involving USD/BDT Spot transactions, Swap transactions, USD/BDT and forward transactions decreased by 10.73 percent to USD 22.31 billion in H1FY22 from USD 24.99 billion in H1FY21. The SWAP (87.01 percent of total transactions) was the dominant trading instrument during H1FY22 among the foreign exchange interbank transaction in the foreign exchange market (Chart V.6). The volume of forward transaction increased by 141.5 percent during H1FY 22 (USD 0.51 billion) compared to H1FY 21 (USD 0.21 billion). While the volume of swap and spot transactions in total interbank transactions have been decreased 12.96 percent and 3.5 percent respectively in H1FY22 compared to H1FY21.

V.4 Capital Market

The capital market in Bangladesh comprising two stock exchanges (Dhaka Stock Exchange and Chittagong Stock Exchange), 66 merchant banks (including 25 scheduled banks), and 37 mutual funds is regulated and supervised by the Bangladesh Securities and Exchanges Commission (BSEC). Market capitalization stood at Taka 5.422 trillion or 15.7 percent of GDP as of end December 2021. Issued capital stood at Taka 1.463 trillion at the end of December 2021. The issued capital and market capitalization in the main stock market (DSE) are on rapid rise from FY20 due to easy monetary conditions and the policy supports from associated regulatory bodies.

Chart V.7: Trends in DSE Broad Index (DSEX) and Turnover

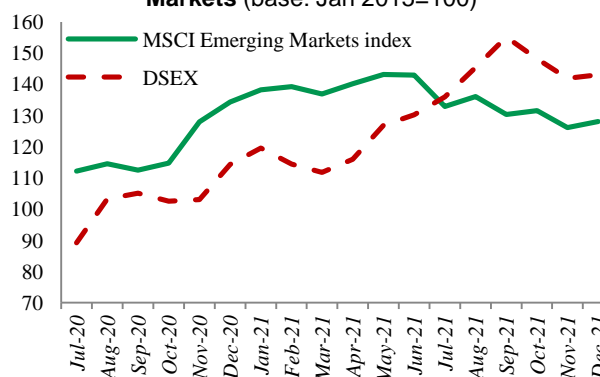


Source: Dhaka Stock Exchange

The capital market for quite some time recognized as overheated evidenced by DSE broad index (DSEX) reached 7329.03 and market price earnings ratio stood at 20.12 at the end of September 2021. The market underwent sharp market price correction in October 2021 and continued up to December 2021. The prime indicator of the capital market, the Dhaka Stock Exchange broad index (DSEX) declined by 7.91 percent to 6756.56 at the end of H1FY22 from 7329.03 at the end of September 2021. However, in December 2021, DSEX grew by 25.08 percent and 9.86 percent from December 2020 and June 2021 respectively. The DSE's daily average turnover picked up significantly to BDT 17.10 billion in H1FY22 from BDT 10.31 billion FY21 (Chart V.7).

The synchronized movements between the global equity market and DSE were observed for the last several years due to an increase in trade and financial integration and global portfolio participation in DSE. In response to the COVID-19 pandemic outbreak, many central banks adopted unprecedented easy monetary and prudential financial policies, and the global capital market started to recover. Likewise, Bangladesh's capital market started to recover in June 2020 and was vibrant than global capital market since July 2021 (Chart V.8)

Chart V.8: Synchronization of DSEX with Global Markets (base: Jan 2015=100)

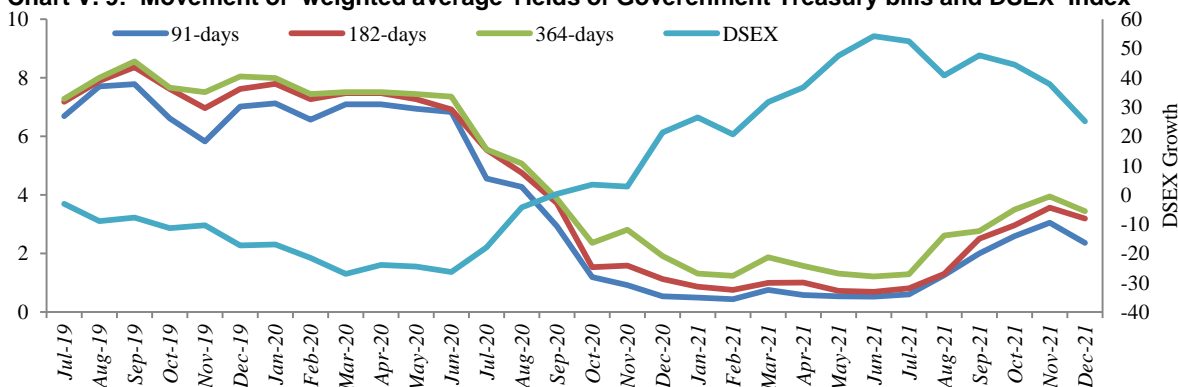


Source: Dhaka Stock Exchange and www.msci.com

The market capitalization of DSE slightly decreased to 15.7 percent of GDP in December 2021 from 16.7 percent of GDP in June 2021. The Bangladesh Securities Exchange Commission (BSEC), merchant banks, and stock exchanges attempted to take appropriate initiatives to listing the number of good fundamental companies, especially profitable state-owned and multinational companies, in order to enhance the market capitalization of DSE.

In 2021, 14 companies, four perpetual bonds, one Green Sukuk bond raised capital through initial public offerings (IPOs) against 8 companies in 2020. Total funds of BDT 21.83 billion raised through IPO in 2021 against BDT 8.49 billion in 2020.

Chart V.9: Movement of weighted average Yields of Government Treasury bills and DSEX Index



Sources: Bangladesh Bank and Dhaka Stock Exchange

From Chart V.9, it is evident that DSEX index and yields on T- bills were negatively correlated. It also shows that T- bill yields rate decreased from July 2020 up to July 2021 and the DSEX index increased from July 2020 to September 2021. Yield on T- bills started to increase again in August 2021 and the DSEX index started to decline from October 2021. The expansionary and accommodative monetary policy helped the capital market through adequate liquidity support.

In order to foster capital market development, a number of steps may be initiated. The government may participate in the capital market more actively. It may endeavor to make the more liquid by floating

treasury bonds and encouraging floatation of more corporate bonds. The availability of such risk-free instruments would allow existing investors to diversify their portfolios and may encourage risk-averse investors to take part in the stock market's investment activities. By successfully mobilizing fund from local sources, the government can also reduce its dependency on foreign funds to finance its development activities. Of course, public awareness and the development of stock market infrastructure are also essential for healthy growth of emerging capital market. In addition, enforceable regulations would have to be ascertained to ensure financial transparency, stop financial malpractices, and prevent any form of market manipulation including fraudulent activities.

V.5 Financial Market Outlook

The global economy is recovering invincibly from the COVID-19 outbreak, though the recovery process is uneven among countries. Bangladesh economy performed well throughout FY21 as overall monetary and fiscal policy performed well with their supportive role to regain the productivity of the economy while capturing the qualitative growth and tackling inflation. Enough liquidity has been seen in the money market through the supportive role of Bangladesh Bank by adopting accommodative monetary policy along with government expansionary fiscal policy. To tackle pressure stemming from an increase in import payments and give encouragement to remitters, Bangladesh foreign exchange market experienced depreciation of Taka against US dollar during H1FY22. Capital market witnessed buoyant during FY21 and its continued the same pace by end December 2021.

The money market is expected to be remained stable as the Bangladesh Bank is expected to ensure enough liquidity in the system and tries to facilitate the growth of private sector credit. Bangladesh Bank stance on mopping up liquidity from the system by issuing bills has indicated that BB does not want interest rates to be too low. To stable the money market, BB will maintain adequate liquidity in the market through its tool like issuing bills.

Capital Market is expected to grow in terms of size and depth as there are some initiatives to get some large companies listed. Continued well performance of capital market will be sustained in FY22 as the economic activities are gaining momentum after the pandemic-induced lock-downs and restrictions. Both exports and imports are growing fast. The demands for workers have grown in the countries that are main sources of wage-earners' remittances for Bangladesh.

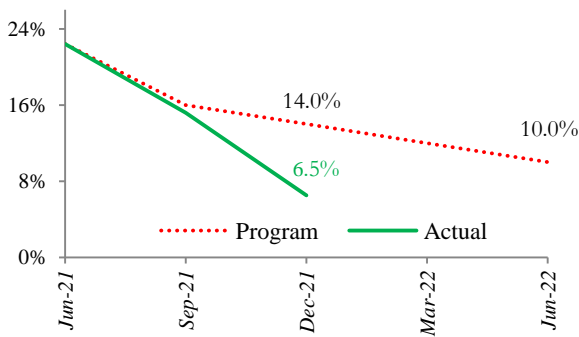
Chapter VI

Monetary Policy Stance FY22 and Looking Forward

VI.1 Monetary Program and Progress

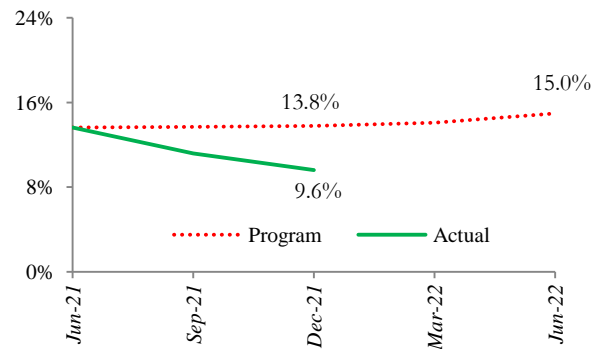
The monetary programs for FY22 are designed for continuing the support toward ongoing economic recovery while maintaining appropriate cautions for overall price and financial stability. Specifically, the FY22 monetary programs are designed to achieve 7.2 percent GDP growth while keeping inflation rate within 5.3 percent as declared in the national budget. Therefore, the mode of monetary policy/program which has been announced for FY22 is basically expansionary and accommodative as like as the previous fiscal year (FY21). The actual developments of key monetary aggregates against their programs are shown below, based on available data up to December 2021.

Chart VI.1: Reserve Money Growth



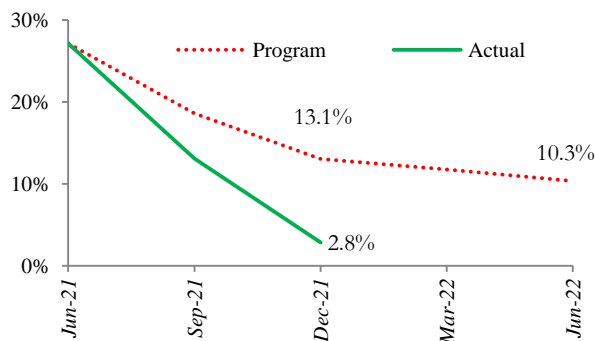
Source: Bangladesh Bank

Chart VI.2: Broad Money Growth



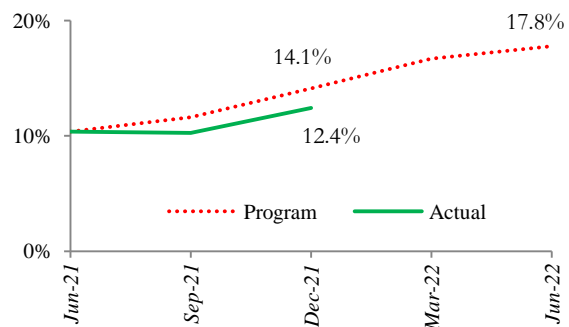
Source: Bangladesh Bank

Chart VI.3: Net Foreign Assets Growth



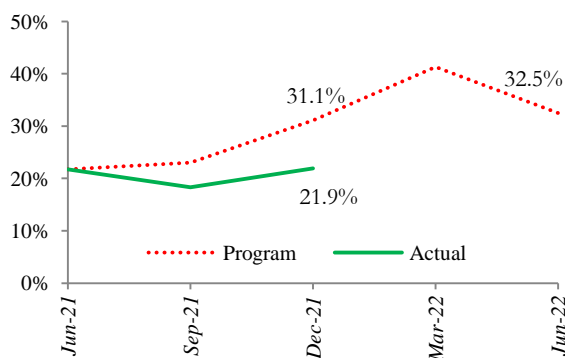
Source: Bangladesh Bank

Chart VI.4: Domestic Credit Growth

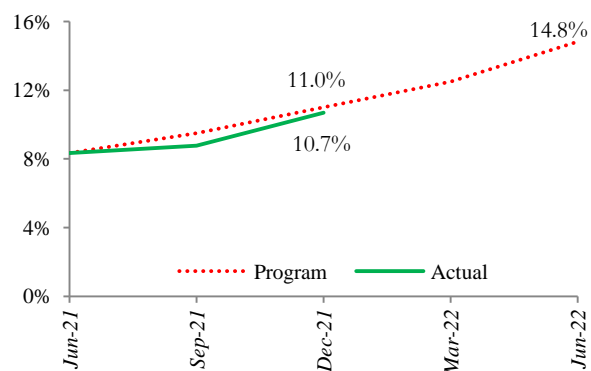


Source: Bangladesh Bank

As per the latest available data, the reserve money and broad money growths, the prime anchoring variables used as operating and intermediate targets of BB's monetary policy, respectively, remained well below the programmed growths during the first half of FY22 (Charts VI.1-VI.2) mainly because of lower growth of net foreign assets (NFA) as compared to the programmed growth (Chart VI.3). The NFA growth was low mainly due to negative growth of inward remittances and robust growth of import payments.

Chart VI.5: Public Sector Credit Growth

Source: Bangladesh Bank

Chart VI.6: Private Sector Credit Growth

Source: Bangladesh Bank

The domestic credit growth, another major causative factor for broad money growth, was also low as compared to the programmed growth (Chart VI.4) mainly due to public sector credit growth (Chart VI.5). The public sector credit, particularly the net credit to government, grew moderately mainly because of higher government borrowings from foreign sources. During the first half of FY22, government borrowed (net, excluding accrued interest) BDT 135 billion, BDT 118 billion and BDT 290 billion from bank, non-bank and foreign sources, respectively, against the targets of BDT 765 billion, BDT 370 billion and BDT 977 billion set for FY22, respectively. However, the movement of private sector credit growth remained close to the programmed path (Chart VI.6) indicating the faster recovery of economic activities owing to reduction of the COVID infection rate.

VI.2 Monetary Policy Implication

Since the inception of the COVID-19 outbreak in early March 2020, Bangladesh Bank has been providing necessary policy supports under monetary policy framework to mitigate the adverse economic impact of the pandemic and revive normalcy in all sectors of the economy. BB has made low-cost loanable funds available for banks and NBFIs by reducing cash reserve ratio and policy interest rates, increasing the ADR and IDR, introducing various low-cost refinance schemes for priority sectors, implementing the large part of government's stimulus packages, extending the EDF with relaxing its maximum limits for banks, and introducing a new credit guarantee schemes for CMSMEs. As a result, the banking system inundated with historically high level of surplus liquidity, though the growth of some monetary and credit aggregates remained relatively slow at the end of FY21 due mainly to ongoing prolonged COVID-19 related uncertainties. In this backdrop, BB has taken some remedial measures including the issuance of BB bills during October-November, 2021. BB has also been continuing the sale of foreign currencies in FY22 to mitigate the depreciation pressure of BDT exchange rate. Therefore, the local and foreign currency markets remained stable with rational level of liquid assets during the first eight months (July-February) of FY22. The FY22 monetary policy decisions have succeeded particularly with regard to the disbursement of private sector credit, necessary for increasing the investment and employment generation.

VI.3 Outlook and Policy

The CPI-based average general inflation, the ultimate target variable of BB's monetary policy, has been facing some pressures in FY22 mainly due to commodity price hike in the international market. The upward revision of domestically administered fuel oil price also made some extra pressure on domestic inflation during the recent months. Thus the average general inflation stood at 5.55 percent at the end of December 2021 against the target ceiling of 5.30 percent set for end June 2022. However, the trend of slow broad money growth and healthy food production in the agricultural sector may be helpful in keeping the inflation rate within a tolerable limit. In addition to negative remittance growth, robust growth of import payments largely stemmed from upward trend of commodity prices at international market is responsible for balance of payment pressure in the current fiscal year. Therefore, the BB is cautiously active and vigilant for taking appropriate policy measures on the development of exchange rate depreciation and inflation expectation.

Part 2

Analytical Research Papers

Revisiting the Monetary Conditions Index for Bangladesh

Md Rashel Hasan³

Raju Ahmed

Md. Habibour Rahman

Mahmud Salahuddin Naser

Abstract

The monetary conditions index (MCI) combines the effect of interest rates and exchange rates in a single indicator and can be used for assessing the overall monetary policy stance. This paper attempts to construct MCI for Bangladesh for the period 2004 to 2020 using monthly data. The weights of interest rate and exchange rate are derived from the aggregate demand framework using Johansen's cointegration techniques. Our estimated monetary conditions ratio is 1.86:1 implying that a 1.86 percent increase (depreciation) in the exchange rate or a 1.0 percentage point rise (100 basis points) in the interest rate has about the same effects over time on aggregate demand. That implies the interest rate channel is stronger than the exchange rate channel in influencing monetary conditions in Bangladesh. This paper is different from Younus (2012) which estimated the monetary condition ratio as 4.88:1 based on the inflation model, reflecting the interest rate channel was even stronger during 2004-2011. The obtained estimates of MCI using the weights of interest rate and exchange rate fairly track the light and soft episodes of monetary policy stance which suggests that in the observed period monetary policy in Bangladesh was mostly expansionary. Furthermore, the findings of the paper show the movements between MCI and inflation are broadly opposite, suggesting that cautious monetary policy might be able to tame inflation to some extent. Thus MCI can be used as an indicator of monetary policy decision-making instrument alongside other indicators.

Keywords: Monetary Condition Index, Monetary Policy

JEL Classification: E52, E58

1 Introduction

Monetary Conditions Index (MCI) is a way of measuring the changes in monetary condition that influences the economic activities. To assess the changes in monetary conditions, central banks calculate the MCI that combined effect of interest rates and exchange rates on the price level and aggregate demand. The weights of interest rate and exchange rate can be obtained employing inflation model or aggregate demand model using the econometric technique. The weights represent the relative impacts of the variables (interest rate and exchange rate) on policy goals. In theory, this calculation allows central banks to monitor the effect of short-term monetary policy by linking changes in interest rates set by central banks with changes to exchange rates influenced by the foreign exchange market. The measure is typically used to help central banks craft monetary policy.

³ The authors are from the Chief Economist's Unit and the Governor Secretariat of Bangladesh Bank. The authors would like to thank Dr. Md. Habibur Rahman, Chief Economist, Bangladesh Bank for his valuable suggestions and comments in the earlier version of this paper. The authors are alone responsible for the views or opinions expressed in this paper and not in any way the institution where they are working. The authors welcome comments and suggestions for improvement of the content and those may be forwarded to rashel.hasan@bb.org.bd

Monetary policy affects economic activities through a series of channels, which are collectively known as the transmission mechanism. Many central banks around the globe, particularly emerging economies, are entrusted with the responsibilities of pursuing multiple objectives of maintaining price stability, supporting inclusive, equitable, and environmentally sustainable economic growth along with the financial stability. Therefore, central banks pursue monetary policies that might have a fragile commitment to its prime objective i.e. price stability. Assigning multiple objectives to central banks induce them to deemphasize on single transmission channels of monetary policy.

In the implementation of policies, central banks try to affect the final targets of monetary policy (usually inflation and growth) with its policy instruments (such as short-term interest rate) through influencing key financial variables such as interest rates, exchange rates etc. with different lags. But the financial deregulations and innovations (both financial and technological) made it difficult for central banks to follow a single channel of monetary policy.

Thus, not only from the point of view of pursuing multiple objectives but also from the perspective of implementation of monetary policy, it is difficult for central banks to rely on single channel of transmission. It is known by the central banks with the time that no single transmission mechanism is enough to understand the monetary policy stance of that country. As a result, the MCI is getting higher importance in central banks' thinking. The appeal of the MCI can be seen from two perspectives:

Firstly, the MCI is based on the transmission of monetary policy that combines two main channels with two monetary transmission variables including the interest rate and exchange rate.

Secondly, the primary usefulness of such a composite index is that the signal provided by the underlying variables is clear and more employable.

Interest rate affects output through its impact on the intertemporal consumption and savings decisions of households, as well as the intertemporal investment decisions of firms. Meanwhile, the exchange rate influences output through its impact on the relative price of domestically versus foreign-produced goods. Thus, a combination of interest rates and exchange rates provides a better indicator of policy stance than either variable alone (Freedman 1995).

Bangladesh has instigated a number of measures in the last decade, including financial innovations within the banking system, financial inclusion activities and updating payment technologies that rapidly transformed the landscape of the financial sector. These financial reforms seem to have affected the behavioral pattern of the velocity and hence could cause instability in the underlying money demand relationship with important consequences for the conduct of monetary policy. Technological development led to greater integration of financial markets and facilitates the faster transaction of monetary policy impulses, thereby helping interest rates emerge as a most preferred operating instrument for Bangladesh.

On the external front, with significant trade and financial account openness in the last two decades, Bangladesh economy has become considerably more integrated with the global economy. Despite the dominance of domestic demand, the role of foreign flows in conditioning the growth process in Bangladesh has become important over time. The domestic economy now reflects global economic

developments reasonably quickly. A higher degree of trade openness and integration of Bangladesh economy with the rest of the world have also imparted difficulties in targeting exchange rates, inducing Bangladesh Bank (BB)-the central bank of Bangladesh increasingly adopts flexible exchange rate regime. As a result, instead of putting increasing reliance on either monetary targeting or exchange rate targeting in the conduct of monetary policy, BB may rely more on an assessment of overall monetary conditions that originating from changes in both domestic and external macroeconomic factors.

The most obvious benefit of the MCI is that it is straightforward and easy to understand. In general, two steps are involved to construct the MCI. In the first step, weights of interest rate and exchange rate need to be calculated using some econometric model. The model could be either output model or inflation model. This study relies on output model where the dependent variable is Quantum Index of manufacturing industries (QI) instead of GDP as QI data is available at the monthly frequency (GDP data is available on yearly basis only). The weighted average lending rate is used as a representation of interest rates. We use the nominal exchange rate (dollar per taka) as another variable in the model.

In light of the foregoing, the objectives of the study are to

- Construct MCI in the context of Bangladesh;
- Identify the extent of interest rate and exchange rate on the MCI;

The study attempts to answers two following questions

- What are the important sources of changes in monetary conditions in Bangladesh?
- How MCI and inflation is moving over time;
- How should we use MCI in explaining the current stance of monetary policy?

Our study contributes to the existing literature on MCI in Bangladesh in several ways. Firstly, in the earlier study, Yonus (2012) estimated the weights of interest rate and exchange rate based on inflation model. However, the effect of interest rate and exchange rate are viewed as equally important influencing output in small open economies (Kannan 2006, Hyder 2006). In this paper, we exploited aggregate demand model to estimate the relative weights of interest rate and exchange rate⁴. Our results suggest that the weight of interest rate and exchange rate is 0.65 and 0.35 respectively. And the estimated monetary conditions ratio is 1.86:1, implying that a 1.0 percentage point rise (100 basis points) in the interest rate or a 1.86 percent increase (depreciation) in the exchange rate has about the same effects over time on aggregate demand. That implies that the interest rate channel is stronger than the exchange rate channel in influencing monetary conditions in Bangladesh.

Secondly, while calculating MCI, the common practice is to deduct the actual value of interest rate and exchange rate from that of a specified base period. In such case, the movement in MCI (up or down) needs to be compared to that base period. However, few papers also do the deviation of interest rate and exchange rate from their equilibrium levels. For instance, the Czech National Bank (CNB) in their

⁴ We also exercised the inflation model while calculation weight of interest rate and exchange rate. The details can be found in the annexure.

inflation report published in the second quarter of 2015 utilized that technique. MCI that uses the deviation of interest rate and exchange rate from their equilibrium level make it possible to compare the movement of MCI of a specific time point relative to the same time point. This paper tried to estimate the equilibrium level of interest rate and exchange rate by using Hodrick-Prescott (HP) filter as did by CNB and finally obtained MCI values⁵.

Obtained estimates of MCI using the weights of interest rate and exchange rate, suggest that in the observed period monetary policy in Bangladesh was mostly expansionary, as reflected by easing monetary condition. The paper also identifies four tight and three soft periods of monetary stance during 2004 to 2020. Furthermore, our findings show that the movements between MCI and inflation are broadly opposite, suggesting that cautionary monetary policy can tame inflation.

The study proceeds as follows. Following the introduction in section-1, section-2 reviews the related studies on the concept of MCI. Section-3 outlines the various analytical and empirical issues in constructing the index taking into the structural characteristics of Bangladesh economy, while section 4 looks at the implications and interpretations of its movement in recent years. The concluding observations are specified in section-5.

2 Literature Review

Monetary Condition Index was developed in the early 1990 and used as an operational target by the Bank of Canada and Reserve Bank of New Zealand (Neil R. Ericsson et al., 1998). Moreover, many international institutions such as IMF, OECD, Goldman Sachs, JP Morgan, Merrill Lynch, and many others calculates MCI for different countries to track monetary policy stance.

In 1997, Dennis, R. estimated MCI for New Zealand using monthly data over the period 1986-1996. To estimate the effect of real interest rate and real exchange rate on excess demand, the study exploits output gap equations. The result indicated a ratio of interest rate and exchange rate which is approximately 2:1. The findings of this study suggested MCI give a better indication of the monetary policy stance than either variable alone (interest rate and exchange rate).

Hataiseree, R. (1998) constructed MCI for Thailand over the period of January 1990 to July 1998 based on inflation model linking to import price index, agricultural price indices and government fiscal indicator. Their result indicated the ratio of interest rates and exchange rates were 3.3:1. Their study employed autoregressive distributed lagged model as econometric technique. The resultant MCI ratio indicates that 1 percent change of interest rate in monetary stance is offset by 3.3 percent change of exchange rate.

Kesriyeli and Kocaker (1999) generated monetary condition index (MCI) for Turkey using inflation model. Their study incorporates real interest rate and real effective exchange rate while estimating weights. The study suggests that the exchange rate is more sensitive than the interest rate for the monetary transmission channel in Turkey.

⁵ We also calculated MCI where the interest rate and the exchange rate has been deducted from a pre-defined base period and can be found in the annexure.

Afterwards, in 2002, Abdul Qayyum estimated a monetary condition index (MCI) for Pakistan over the period 1990 to 2001. The study relied on inflation model to estimate the weights of interest rate and exchange rate. The estimated weights of interest rate and nominal exchange rate were 0.736 and 0.264 and in terms of ratio, it becomes 2.79:1. Their resultant MCI indicates that monetary condition was tight during 1997 to 1999.

In another Study, Peng and Leung (2005) calculates a monetary conditions index (MCI) using quarterly data from 1994Q1 to 2004Q2 for assessing monetary conditions on Mainland China. They estimated two forms of MCI (narrow and board) using real interest rates, real effective exchange rates and credit supply in aggregate demand equation. The estimated MCI suggests easing monetary conditions with an appreciation of the local currency, reducing the interest rate, grew of bank credit which is accelerated to economic growth.

Tobias (2005) developed a monetary condition index for South Africa over the period of 1994Q1-2003Q4. They estimated the weights of real interest rate and real effective exchange rate by least square approach where the output gap was the dependent variable. The study shows the ratio of interest rate and exchange rate was 1.9:1 that means the real interest rate is more influential than the exchange rate on the monetary transmission process for South Africa.

Hyder and Khan (2006) constructed the monetary condition index for Pakistan and relative weights of interest rate and exchange rate have been calculated using Johansen cointegration approach. The estimated MCI found that there were eight tightening and six easing episodes of monetary conditions in Pakistan over the period of 1991 to 2006.

Khannan et al. (2006) estimated monetary condition index (MCI) for India over the period of 1996Q2 to 2007Q1. Their paper constructed broad MCI which derived from credit growth with interest rate and exchange rate channel along with traditional narrow MCI. Their analysis indicates that interest rate is more sensitive than the exchange rate to explain the monetary condition in India.

Similarly, Poon, W. C, et al. (2008) estimate a monetary condition index by examining the relationship among real interest rate, exchange rate, share price and claims on private sector credit with regards real output in Singapore. This study uses ARDL bound test approach to calculate the weight of the selected variable as estimated to MCI ratio. The result of this study indicates that monetary authorities consider MCI indication to take their monetary decision because MCI is significantly interlinked with real output in Singapore. This analysis suggests the MCI will more efficient in inflation targeting regime in Singapore.

Younus, S. (2012) derived Monetary Condition Index (MCI) for Bangladesh using weights of real lending rate and nominal exchange rate through the price equation model over the period of 2004 to 2011. The paper shows the weights of interest rate and the exchange rate was 0.83 and 0.17 respectively and the ratio of these two rates become 4.88:1. It indicates that 1 percentage change in the lending rate would have 4.88 percent offsetting effect on the exchange rate.

Horry, H., et. al. (2018) calculated the monetary condition index for Iran for the period of 1978 to 2012. They used ARDL approach to estimate the weight of MCI variable based on the demand equation. They found the exchange rate is more powerful than the interest rate to influence monetary condition in Iran.

3 Construction of MCI

3.1 Methodology

The MCI is defined as the weighted average sum of the changes in the interest rates and in the exchange rates in relation to the base period.

$$MCI_t = w_r(i_t - i_0) + w_e(e_t - e_0), \quad w_r + w_e = 1 \dots \dots \dots (1)$$

where i_t is short-term interest rate and e_t is the exchange rate in period t respectively, i_0 and e_0 are interest rate and exchange rate, respectively, in a given base period, w_r and w_e are weights of the interest rate and exchange rate express the impacts of those parameters on policy goal such as output growth or inflation. Both interest rate and the exchange rate could be either in nominal or real term, however, estimated MCIs derived from nominal or real terms would have similar movements in the short-run as relative prices and inflation rates are reasonably the same (Eika et al (1996)).

The construction of MCI is involved in several steps. At first, we need to estimate the weights of the exchange rate and the interest rate as those are not directly observable. The literature addresses various methods to estimate those weights using econometric techniques. The most commonly used theoretical models are aggregate demand equation or price equation (IMF, OECD, Deutsche Bank estimated MCI using these approaches). Kannan and Bhoi (2006) also exploited the aggregate demand model to estimate weights of interest rate and exchange rate for the Indian economy. As a small open economy like Bangladesh, both interest rate and exchange rate can be considered as policy variables in the monetary transmission process. Moreover, changes in the interest rate and exchange rate can significantly influence both domestic demand and export earnings (external sector heavily dependent on export, more than 80% of external income is coming from export). To quantify the relative importance of interest rate and exchange rate, we exploited the aggregate demand model. As the relationship among output, interest rate and exchange rate may be dynamic in nature and all the three variables exhibited having unit-roots, we applied Johansen's co-integration technique to reveal both short-term and long-term relationship among them. Aggregate demand equation can be expressed as below:

$$y_t = \beta_0 + \beta_1 i_t + \beta_2 e_t + \epsilon_t \dots \dots \dots (2)$$

where y_t is aggregate demand, i_t is short-term interest rate, e_t is the exchange rate ϵ_t is the error term.

3.2 Data

Data of the selected variables namely lending rate, exchange rate and quantum index are observed on a monthly basis from July 2004 to August 2020. It may be noted that a market based floating exchange rate has been introduced in the mid of 2003. The study period has been incorporated since 2004 to capture the effect of market-based exchange on the economy. The lending rate was used as a proxy variable to track

the interest rate channel of the monetary policy transmission mechanism. The bilateral nominal exchange rate has been employed to capture the exchange rate channel. Both weighted average lending rate and nominal exchange rate have been collected from Bangladesh Bank's various publications. Quantum index of manufacturing industries has been used as a proxy of gross domestic product (GDP) to quantify economic activities (GDP is available annual basis only). Data on the quantum index has been incorporated from the Bangladesh Bureau of Statistics.

3.3 Model Specification

As discussed earlier, we need to have relative weights of interest rate and exchange rate to construct MCI. In order to estimate weights of interest rate and exchange rate, we rely on the output model which is shown in the following equation (3):

$$\log Q_t = \beta_0 + \beta_1 LR_t + \beta_2 \log_exch_t + \epsilon_t \dots \dots \dots (3)$$

Where $\log Q_t$ is the quantum index for manufacturing industries in logarithm form for time t, LR is the weighted average lending rate, \log_exch refers to nominal exchange rate taka per USD in logarithm form, β 's are the parameters to be estimated and ϵ are error term.

3.4 Testing Stationarity of the Data

The property of data, whether it has unit root or not, is checked by the standard ADF method and Phillips-Perron unit root test. All data series except lending rate are in natural logarithm. The result reported in Table 3 indicate that all the series are not stationary evident by both the ADF test and PP test. However, the first difference of each of the data series shows stationary at 1% significance level according to both ADF and PP test.

Table 1: Unit Root Test

Variable	Level		First difference	
	t-stat, ADF test	t-stat, PP test	t-stat, ADF test	t-stat, PP test
logQ	-0.506	-0.741	-5.266***	-40.708***
LR	-0.354	0.204	-4.539***	-11.621***
log_exch	-2.207	-2.108	-6.413***	-10.607***

Note: ***, **, * indicate significance at 1, 5 and 10% respectively

3.5 Cointegration Analysis

As data series can be made stationary after first differencing, there is a possibility that data series might have a co-integration relationship in the long-run. We can apply Johansen (1988, 1990) techniques to test the co-integration relationship among the variables (output, interest rate and exchange rate). Before applying co-integration technique, selection of appropriate lag length is very important. Optimal lag length can be determined with the help of the unrestricted VAR model. After running unrestricted VAR, optimal lags have been selected as 1 on the basis of Schwarz Criterion (SC). Johansen's cointegration technique that uses both maximum eigenvalue and trace statistics has determined the existence of one co-

integrating vector. Table 2 displays test statistics values that can be obtained from both rank test and trace tests.

Table 2: Cointegration Results Based on Johansen Test

	Max Rank Test		Trace Test	
	H0		H0	
	r =0	r =1	r =0	r =1
<i>Intercept and no trend</i>				
[logQ, LR, log_exch]	25.33**	8.99	35.94**	10.60

** Denotes rejection of null hypothesis at 5% significance level

Based on the normalized value that we got from the first cointegrating analysis can be represented in the following equation:

$$\log Q = -8.09 LR + 4.27 \log_{exch} \dots\dots\dots (3)$$

(0.0164) (0.2489)

Both the coefficients exhibit expected signs and turned out to be statistically significant (values in the parentheses are standard error). That is an increase in lending rate lowers aggregate demand. On the other hand, an increase in nominal exchange rate measured as taka per USD (depreciation) has positive impact on aggregate demand. From this estimated model we can obtain weights of rate of interest and exchange rate. From equation (3), the weights for interest rate (w_r) and exchange rate (w_e) suggests to be 0.65 [$(w_r/(w_r + w_e))$] and 0.35 [$(w_e/(w_r + w_e))$], respectively. The estimated monetary condition ratio is about 1.86:1 (w_r/w_e) which implies that a 1.0 percentage point rise (100 basis points) in the interest rate or a 1.86 percent increase (depreciation) in the exchange rate has about the same effects over time on aggregate demand. That implies interest rate channel is more powerful than exchange rate channel to influence aggregate demand in Bangladesh. Kannan (2006) who exploited output model for India and also found interest rate channel is superior to exchange rate (estimated ratio of interest rate and exchange rate was 1.36:1 for India). Moreover, Younus (2012) exploited inflation model to estimate relative weight of interest rate and exchange rate and found the ratio 4.88:1 for Bangladesh during January 2004 to March 2011.

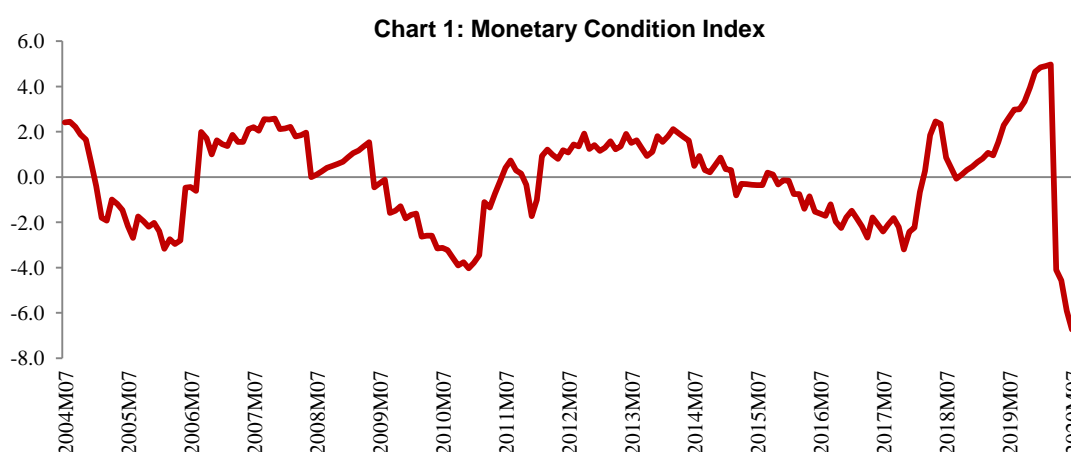
4 Movements of the Monetary Condition Index: Implications and Interpretations

By using estimated weights that we obtained in the preceding section, a monetary condition index has been prepared. While calculating MCI, the common practice is to deduct the actual value of interest rate and exchange rate from that of a specified base period as shown in eq(1). However, few studies also use the deviation of interest rate and exchange rate from their equilibrium levels⁶. This study tried to estimate the equilibrium level of interest rate and exchange rate by using Hodrick-Prescott (HP) filter as did by

⁶ For instance, the Czech National Bank (CNB) in their inflation report published in the second quarter of 2015 utilized that technique.

CNB bank^{7,8,9}. This would provide the possibilities to compare any situation with the equilibrium and to conclude whether or not the monetary conditions in the period have been too tight or too loose compared with the equilibrium period. By using the relative weight of interest rate and the exchange rate of 0.65 and 0.35 respectively, MCI values have been calculated using equation (1). Thus a rise in MCI values refer to an indication of tight monetary condition and a fall in MCI values indicates an easing of the monetary condition¹⁰.

Based on the values of MCI, chart 1 displayed different phases of the monetary conditions in Bangladesh. The development of the MCI shows that there are seven distinct phases of monetary condition during July 2004 to August 2020 of which four phases indicate ease monetary conditions and three show tight monetary conditions.



Phase I: The downward movement of MCI since the beginning of 2005 until mid-2006 indicates an easy monetary policy stance. Bangladesh economy was adversely affected by the 2004 flood. Accordingly, the monetary policy stance in 2005 has been supportive of growth reflecting in part by increased lending to the agricultural sector for flood rehabilitation. But an accommodative stance generated pressures on the exchange market leading to a sharp fall in the nominal exchange rate (depreciation) exacerbated further by the aftershock of the introduction of the market-based floating exchange rate in May 2003.¹¹ At the

⁷ Although MCI calculated based on deviation from a base period or deviation from equilibrium level would have result similar interpretation, the later would be more useful as it would not require comparing the tightness or easiness from a specific period in time.

⁸ Estimates of MCI based on the deviation from the interest rate exchange rate from a base period have also been calculated and can be found in the annexure.

⁹ In order to avoid end sample bias generated from HP filter, we truncated the estimated value of both interest rate exchange rates for the last two months in our final results.

¹⁰ While calculating MCI using equation (1), nominal exchange rate has been used as dollar per taka. So an increase in the exchange rate indicates domestic currency appreciation and thus higher interest rate and currency appreciation will resultant higher MCI (that is, tight monetary condition). MCI values close to zero indicates a neutral monetary condition.

$MCI_t = w_r(i_t - i_0) + w_e(e_t - e_0), \quad w_r + w_e = 1 \dots \dots \dots (1)$

¹¹ Since the introduction of floating the exchange rate in 2003, the authorities have confined their interventions to counter disorderly market conditions. The foreign exchange market, however, had been truly tested in early 2005 when the economy was

same time, Bangladesh economy faced with an upswing in global oil and commodity price that contributed to a surge in inflation. Subsequently, a tighter monetary policy stance was essential to ensure price stability and orderly exchange market conditions. Monetary tightening came in the form of an upward adjustment of repo interest rate and Cash Reserve Requirement (CRR).

Phase II & III: As depicted by the upward MCI, the monetary conditions were tight in most of the period in FY2006-FY2009 with GDP growth remained firm spurred by strong growth of export and remittances. But inflation remained uncomfortably high due to multiple natural disasters and elevated international food and fuel prices. Government and private sector credit growth soared during the period due to the need to finance rice procurement from domestic markets and imports from international markets. With short-term government securities rates increased gradually, banks lending and deposits interest rates have seen a modest increase creating tight monetary conditions at that point. The real effective exchange rate appreciated somewhat in this period as a result of domestic inflation. Responding to the situation, Bangladesh Bank has kept the dollar exchange rate stable to guard against intensifying imported inflation pressures. The concerns of the global economic downturn since 2008 prompted Bangladesh Bank like many central banks to pursue an easy monetary policy that facilitated the process of the economic recovery that traced till the start of 2011. Monetary conditions were increasingly loosened as shown by a falling MCI during FY09-FY10. The improvement in the current account at that period put upward pressure on taka which Bangladesh Bank countered through unsterilized foreign exchange purchases. The injection of liquidity from unsterilized interventions caused the bank's excess reserves to rise sharply, pushing interest rates below.

Phase IV: The continued pursuance of easy monetary policy helped to recover growth. But the resulted growth pressures along with rising crude oil and other commodity price fuelled inflationary spirals warranting Bangladesh Bank to pursue preemptive monetary tightening since 2011. Lending rate caps for most of the types were lifted in March 2011, with a subsequent 200-300 basis points rise in their base rates. Bank-by-bank credit to deposit ratio (CDR) ceiling was imposed around the same time. The MCI started to pick-up strongly from early 2012 until reaching its pick at the beginning of 2014. The monetary tightening was a result of the rise in both the real interest rate and the exchange rate. Repo interest rate was raised by 100 basis points. Moreover, the rising of CRR by 50 basis points in June 2014 was also attributable to such tight episode.

Phase V & VI: Against global headwinds and episodes of domestic political turmoil and uncertainty, domestic demand and activity have weakened markedly in the second half of FY15. However, headline inflation eased helped in part by favourable agricultural production and falling global commodity prices. In the meantime, the current account balance turned into a deficit due to slower exports, higher imports and a decline in remittances. Repo interest rate was reduced a couple of times to boost credit growth. During FY18 private credit growth picked-up strongly. In response, Bangladesh Bank reduced the maximum advances-to-deposit ratio (ADR). The CRR was also increased by 50 basis points. With

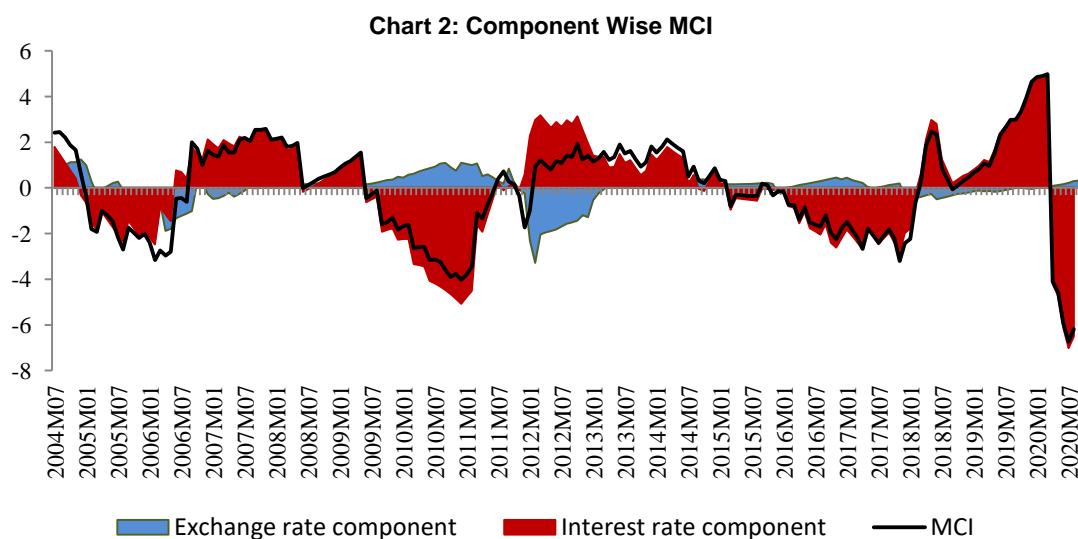
confronted by multiple external shocks i.e. global fuel oil and commodity price shocks. To ease the pressure, Bangladesh Bank sold foreign exchange reserves in January 2005 while allowing the taka to depreciate by 5 percent against the U.S. dollar.

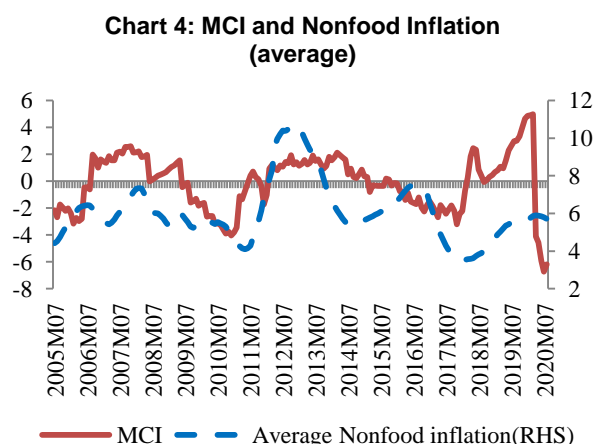
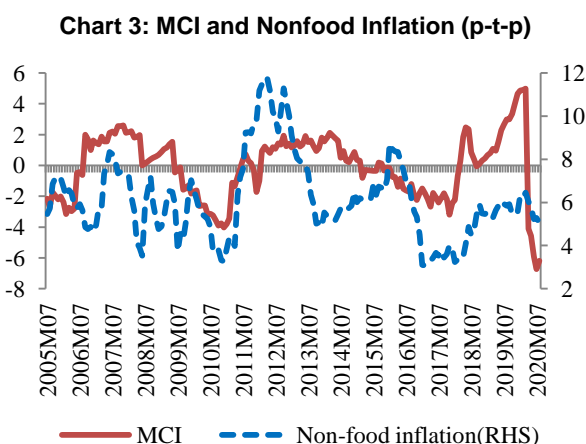
liquidity tightening, deposit and lending rates have begun to increase in 2018. The adverse impact of high issuance of higher interest-bearing National Savings Certificates (NSCs) and growing non-performing loans kept the upward pressure on interest rates. The high level of stressed assets narrowed banks' ability to engage in new lending and constrained access to credit thereby generating tight monetary conditions well traced by the upward movement of the MCI curve.

Phase VII: Domestic activities started to decline as the COVID-19 pandemic concentrated in the last quarter of FY20 and the first quarter of FY21. The government and Bangladesh Bank have announced a series of stimulus package with a total size of over Taka 1.21 trillion (about 4 percent of GDP). Bangladesh Bank moved rapidly to provide the necessary flow of credit to support the economy functioning. Bangladesh Bank has eased monetary policy by lowering the repo interest rate and the CRR, expanded provision of the repo facility, initiated the outright purchase of t-bills, raised Advance-Deposit Ratio (ADR) to facilitate credit to the private sector and improve liquidity in the banking system. Liquidity provision in the foreign exchange market was eased by selling USD by Bangladesh Bank. The easy monetary conditions are reflected by the sharp fall in the MCI since March 2020.

Relative strength of exchange rate and interest rate on the MCI is shown in Chart 2. It shows that the index movement is mostly subject to the movement in interest rate and for some period exchange rate was moving in the opposites direction, off-setting the affect of the interest rate.

Finally, Charts 3 and 4 represent the movement of MCI and nonfood inflation. The Charts show that, in most of the cases, higher MCI values is associated with falling nonfood inflation.





5 Conclusion

The study focuses on the contribution of MCI for Bangladesh and its application to the Bangladesh economy. The MCI derived in this study appears to indicate the actual monetary policy stance. The different phases of monetary tightening or easing in the context of Bangladesh can be better captured by the MCI compared to the trends in the interest rate or the exchange rate alone. Although Younus (2012) estimated the monetary condition index for Bangladesh over the period January 2004 to March 2011, our paper differs and adds values to the existing literature in several ways. Firstly, Younus (2012) exploited the inflation model to estimate relative weights of interest rates and exchange rate though, the effect of interest rate and the exchange rate is viewed as equally important influencing output in small open economies (Kannan 2006, Hyder 2006). In this paper, we introduced an aggregate demand model to estimate the relative weights of interest rate and exchange rate from July 2004 to August 2020. Our results suggest that the weight of the interest rate and the exchange rate is 0.65 and 0.35 respectively. And the estimated monetary condition ratio is 1.86:1, implying that a 1.0 percentage point rise (100 basis points) in the interest rate or a 1.86 percent increase (depreciation) in the exchange rate has about the same effects over time on aggregate demand. That implies that the interest rate channel is stronger than the exchange rate channel in influencing monetary conditions in Bangladesh. Younus (2012) found the monetary condition ratio as 4.88:1 indicating interest rate channel even stronger during 2004-2011 based on the inflation model. Secondly, calculating MCI is generally based on deducting the actual value of the interest rate and exchange rate from that of a specified base period. In such a case, the movement in MCI (up or down) needs to be compared to that base period. However, few papers also do the deviation of interest rate and exchange rate from their equilibrium levels (for instance, the Czech National Bank (CNB) in their inflation report published in the second quarter of 2015 utilized that technique). MCI that uses the deviation of interest rate and exchange rate from their equilibrium level makes it possible to compare the movement of MCI of a specific time point relative to the same time point. This paper tried to estimate the equilibrium level of interest rate and exchange rate by using Hodrick-Prescott (HP) filter as did by CNB bank and finally obtained MCI values.

Obtained estimates of MCI using the weights of interest rate and exchange rate suggest that in the observed period monetary policy in Bangladesh was mostly expansionary, as reflected by easing monetary condition. The paper also identifies four tight and three soft episodes of monetary policy stance from July 2004 to August 2020. Furthermore, our findings show that the movements between MCI and inflation are broadly opposite, suggesting that cautionary monetary policy might be able to tame inflation to some extent. Thus MCI can be used as an indicator of monetary policy decision-making as a technical instrument alongside other indicators. Bangladesh Bank can use the MCI as an indicator in monetary policy analysis. In this capacity, Bangladesh Bank would not use monetary policy tools to adjust the level of the index to the desired path, but rather it would help to inform policymakers of the current stance of monetary conditions, and whether they are tighter or easier relative to other periods.

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Determinants of Commercial Bank Lending Rates in Bangladesh

Murad Ullah Bhuiyan¹²

Abstract

This paper focuses on the determination of commercial bank lending rates in Bangladesh using autoregressive distributed lag (ARDL) model. The paper finds that deposit rate (DR) and ratio of non-performing loan (NPL) to total loans have both the short-run and long-run impact on commercial banks' lending rate determination when the sample period FY98-FY19 is considered. The paper also identifies that profitability ratio has long-run impact but per capita employment cost has only short-run impact on lending rate determination in Bangladesh. If the data sample includes FY20 which is a different year as government has set a cap on lending rate on 24 February 2020, the coefficients of determinants of lending rate appear to be different than those of the previous sample. For the sample period which includes FY20 data, only deposit rate is found to have both short and long run impact for determining lending rate. All the other variables seem to have no impact on the lending rate determination when the sample period extends up to FY20.

Keywords: Lending Rate, Credit, Banks, Bangladesh

JEL Classification: E43, E51, G21

1. Introduction

Until 1990, the lending rate structure of Bangladesh was administered in a mechanism but both types of interest rates (on deposit and lending) were not changed immediately while changing in inflation. Moreover, the Government attempted to give positive incentives to the depositors by raising deposit rate, while lowering the lending rate for investors' interest at the same time. However, after a reform program in the financial sector initiated in 1990, a new interest rate policy was introduced based on the market-oriented interest rate system. Under the new policy, banks were allowed to fix their interest rates for both deposit and lending within a range set by the Bangladesh Bank (BB) for different sectors excluding agriculture, small-medium entrepreneurs (SMEs) and export sectors. However, the range was removed by allowing the banks to set their own interest rates effective from 19 February 1997.

As Bangladesh attempts to become the top three fastest growing economies in the world by next decade, according to 7th Five Year Plan of Bangladesh, the investment must be increased. The GDP of Bangladesh has been growing at an average rate of 6.1% with an average gross domestic investment as

¹²The author is a Joint Director from Chief Economist's Unit of Bangladesh Bank. The author is grateful to Ahmed Jamal, Deputy Governor, Bangladesh Bank, Dr. Md. Habibur Rahman, Chief Economist, Bangladesh Bank, Dr. Md. Ezazul Islam, General Manager, Bangladesh Bank and Dr. Md. Salim Al Mamun, Deputy General Manager, Bangladesh Bank for their valuable suggestions and comments on the earlier version of this draft. However, the views and opinions expressed in the paper do not necessarily reflect that of Bangladesh Bank. Any comment or suggestion for improvement of the content may be forwarded to murad.ullah@bb.org.bd

percent of GDP of 27.2% during FY11 to FY15. The 7th Five Year Plan stipulates average yearly economic growth of 8.25% in FY20 and the average gross domestic investment as percent of GDP should expand from 28.9% in FY15 to around 34.4% by FY20. (Source: 7th Five Year Plan). But because of COVID-19 pandemic, the GDP grew by only 5.24% in the FY20 where average gross domestic investment as percent of GDP was 31.75% (Source: 8th Five Year Plan). Moreover, the data show that the credit growth did not increase that much because of high lending rate in last decade with some exception from FY04 to FY14 (shown in appendix table 1). As a result, economic growth had been lower than its potentials as investors determined not to invest because of high cost of borrowing. Considering this situation, Bangladesh Bank issued a circular dated 24 February 2020 that the lending interest rate cannot be more than 9% for advance or investment except credit card with effective from 1 April 2020.¹³ It is important to examine which factors are playing determining roles for lending rate in Bangladesh. Setting the lending rate for the banking sector of Bangladesh depends on cost of fund, demand and competitor's interest rate on deposit. The deposits in different banks are their main source of loanable funds. To attract such deposits, banks need to be generous to the depositors by offering higher deposit rates as well as convenient and quicker service. Consequently, banks might adjust the lending rate to lift it faster instantly if interest rates on government bonds and other financial securities increase. However, banks may not automatically decline their lending rates immediately based on market rates. Hence, it becomes costly for customers to turn to a different lender after developing certain business contacts as asymmetric information exists between banks and their customers.

In Bangladesh, the interest on non-bank savings certificates such as National Saving Directorate (NSD) certificates charge a fixed interest rate of 11.28% (with effect from 23.05.15 onward) on saving. As a result, it is very difficult for banks to attract deposits by a deposit rate more than 6% (It was 5.06% in July FY20 and gradually declined to 4.36% in April FY 21), which seems to be low considering that it only meets the current rate of inflation.¹⁴ The lack of loanable funds at schedule banks will therefore tend to push the lending rate up.

As mentioned above, Bangladesh's scheduled banks have the right to set their lending rates according to their own business interests following BRPD circulars, auctions on government bonds and bills. If interest rates of government bonds and bills increase, the lending rate of commercial banks will also increase. Therefore, if the commercial banks set relatively higher interest rate on lending, there will have possibility of higher risk of non-performing loans (NPL) in banking sector. Moreover, in most cases, these non-performing loans (NPLs) cause dual problem of adverse selection and moral hazard, which arise in the presence of asymmetric information where the borrower has more information than the lender.

Considering the importance of lending rate determination, Rouf and Chowdhury (2015) analyzed the factors that are liable for high lending rate in Bangladesh and found that deposit rate, excess reserve, consumer price index (CPI) and policy rate significantly affect commercial bank lending rate. However, they did not analyze the dynamic impact (short and long run impact) of determinants on lending rate.

¹³ BRPD Circular No: 03, Dated: 24 February 2020

¹⁴Source: Monthly Economic Trend, January 2021, Bangladesh Bank.

This research attempts to find the determinants of commercial bank lending rate in Bangladesh considering the dynamic impact. Therefore, the objective of the study is to find out the magnitude or related factors that affect the interest rate on lending in Bangladesh.

The remaining parts of the paper are furnished in several sections. A brief literature review is discussed in the section 2 followed by model specification in section 3. Section 4 reports the empirical results. Finally, section 5 contains a summary of the findings, conclusion and policy recommendation.

2. A Brief Literature Review

As the main objective of this research is to find out the determinants of lending interest rate in Bangladesh, the literature review section analyzes and integrates information regarding lending rate determination in Bangladesh. Consequently, this section proceeds with focusing on the theoretical perspective of lending rate determination in sub-section 2.1, followed by empirical evidence from both international and domestic context in sub-section 2.2 and finally discusses the literature gap in sub-section 2.3.

2.1 Theory related to interest rate determination

Theoretically the interest rate on lending is broadly determined by five approaches such as (i) Classical theory of interest rate determination or Real theory of interest rate determination (ii) Neo-classical theory of interest rate determination or Loanable fund theory of interest rate determination (iii) Interest rate determination through Keynesian theory of liquidity preference (iv) Neo-Keynesian theory of interest rate determination or Modern theory of interest rate determination (v) Interest rate determination by Fisher's model approach.

Classical theory of interest rate determination or real theory of interest rate determination was introduced by Cassels (1903), A.C Pigou (1936) and then developed by Taussing (2013) and Walras (2014). They all found that real factors such as productivity determine the real interest rate. In this theory, interest rate is determined by the intersection of demand for money and supply of money for investment. Following classical theory, D.H. Robertson (1937) developed the theory of neo-classical regarding interest rate determination based on loanable fund by incorporating both real sectors and monetary sectors. The difference between classical theory and neo-classical theory is that in classical theory only saving (saving indicates goods and services consumed for productive purposes instead of money) is considered for investment whereas in neo-classical theory savings including hoarded wealth, banks credit, disinvestment wealth are considered as loanable fund for investment.

J.M Keynes (1936) determined interest rate through the theory of liquidity preference. According to his theory, interest rate is the point at which demand for money is equal to supply of money in the money market. In this connection, the interest rate can be determined by changes in the money supply by central bank through open market operations either purchasing or selling bonds. Interest rate is also determined by cash reserve ratio which is set by the central bank of a country. On the other hand, the demand for money is the demand for currency that people hold and the reserves maintained by the banks. For

example, Gambacarta (2008) pointed out that a rise in the money market rate surges the opportunity cost of other forms of financing such as bonds, National Saving Certificate etc., which makes lending rate more attractive. This form of mechanism increases demand for money and consequently raises lending rate. Therefore, the interest rate is the equilibrium magnitude of demand for and supply of money. Commercial banks balance sheet can be another approach of interest rate determination as commercial banks are operating as oligopolistic market where banks set lending rate considering demand for loans and cost of the fund of that loan. Following Keynes, Hicks (1983) develops a modern theory based on savings and investment form classical theory of interest, demand for money and supply of money from Keynes's liquidity preference in which interest rate is determined jointly from goods market and money market through IS and LM curve where IS curve represents saving and investment in the goods market and LM curves shows equilibrium in the money market for real money balance. Besides these theories, Fisher (1907) postulates a new approach for interest rate determination where interest rate is proportionately changed by expected rate of inflation. However, this change may not necessarily hold in an economy due to a variety of institutional factors observed by Felstein and Eckstein (1970).

2.2 Empirical evidence of determinants of interest rate

Macroeconomic indicators such as economic growth, inflation and interest rate reflect how well a country's financial stability is. According to the Keynesian income identity, investment is one of the key elements of gross domestic product (GDP). But investment is inversely related to interest rate on lending. If a country has unusual lending rate, investment will be interrupted. Therefore, it is important to keep the lending rate in a suitable condition which means not too high or too low. Due to persistent high lending rate, Bangladesh Bank sets 9% lending interest rate cap with effective from 1 April 2020 in order to reduce interest rate spread for encouraging the investment activities.

Previous study by Victor and Eze (2013) suggest that lending rate as well as monetary policy measure the performance of banks because they found that lending rate and monetary policy have significantly positive impact on deposit in Nigeria. Lawrence and George (2016) found that interest rate on lending in Ghana is positively affected by nominal exchange rate and monetary policy of central bank but negatively affected by budget deficit, real GDP and inflation. Therefore, commercial banks require more emphasis on credit risk and liquidity ratio because it weakens loan disbursement and makes bank insolvent (Mitku, 2014).

In the context of Thailand, Menkhoff and Suwanaporn (2007) examine the determinants of bank lending in Thailand. They found that the increase in interest rate on deposit to compensate their increased risk and to control the potential loss of non-performing loans (NPL) are liable for high lending rate. Therefore, they suggest that banks require to be cautious in lending. Banks should not charge too low lending rate as the interest from the loan will not cover the cost of fund or too high lending rate that creates an adverse situation for the borrowers.

The performance of loan in the banking sector depends on its size, liability, non-performing loans (NPL) to total loans and inflation (Tomak, 2013). Timsina (2014) has tried to determine commercial bank

lending behavior in Nepal. The analyst analyzes data from time series using Ordinary Least Square (OLS) technique where private sector credit is the dependent variable, and deposit, interest rate on deposit, cash reserve requirement ratio (CRR), liquidity ratio, GDP, inflation and exchange rate are the explanatory variables. The author has found that GDP and liquidity ratio of schedule banks have the biggest impact on their lending. Following Timesina, Bhattarai (2015) analyzes and suggests that the lending rate of commercial bank in Nepal is influenced by operating cost of bank, profitability ratio and the risk of bad loan.

Cuberoet al. (2016) express their preliminary thoughts regarding bank lending rate and spread of interest rate of Bangladesh in the IMF country report in January 2016. They explore that inflation, high NPLs, low recovery ratios for bad loans are the main drivers of higher lending rate and increased interest rate spreads in Bangladesh; however, they did not use any statistical tool or time series technique to analyze the data. They applied trend analysis only in order to explain their thoughts in the country report. Hence, there is a room for dynamic quantitative analysis in order to identify the lending rate determinants.

2.3 Establishing the bridge on the literature gaps in Bangladesh

According to contemporary empirical literature, the lending rate depends on a variety of factors. Younus et.al. (2020) tried to identify the factors and determinants of lending rate behavior in Bangladesh by using Ordinary Least Square (OLS) method spanning quarterly data from 2010 to 2018. They found that deposit rate is the only determining factor of lending rate for all kinds of banks (SCBs, PCBs, SPBs and FCBs) in Bangladesh. National savings certificate (NSC) rate (both 3-year and 5-year) does not have impact on lending rate for all kinds of banks except State Owned Commercial Banks (SCBs). Moreover, they found that Non-performing Loan (NPL) has impact only in SCBs but the sign of the coefficient is negative whereas private sector credit has no impact on lending rate in Bangladesh. This work was the first attempt of lending rate determination in Bangladesh. The authors critically analyze the data to find out the determinants of lending rate; however, they did not analyze any dynamic impact of the determinants for short-run, medium run or long-run.

Rouf and Chowdhury (2015) attempted to examine the factors that influence commercial banks' lending rates in Bangladesh using Ordinary Least Square (OLS) technique based on the time series data spanning 1994-2014 and found that Consumer Price Index (CPI), excess reserve, and deposit rate effect significantly on commercial banks' lending rate. However, they did not find non-performing loan (NPL) as statistically significant, although it is one of the most important factors forcing banks to fix high interest rates on lending. Moreover, they did not use cointegration technique to analyze or identify whether there exists any long-run equilibrium relationship among the selected variables.

Rahman et. al. (2019) identify whether banks follows single digit interest rate by scrutinizing the factors of lending rate and deposit rate in Bangladesh. Authors found that loans related to consumer's credit, constructions, transportation and trade with green and SME finances have more than 9 percent interest rate while weighted average deposit rate is less than 6 percent for the whole banking sectors. In addition, they found that cost of the fund, deposit rate offered by others banks, market rate, demand and supply of

loanable funds, regulatory compliances, assets-liabilities mismatch and NPLs significantly influence lending rate. This is the first paper which analyzes the single digit interest rate in the perspective of Bangladesh; however, it is limited only static analysis instead of dynamic analysis. As there was no significant study on determining dynamic factors (short-run or long-run) of commercial bank lending rate in Bangladesh, this research tries to overcome the limitations of the earlier studies and hence find determinants of commercial bank lending rate and its implication for the economy of Bangladesh.

3. Sources of data and Methodology

3.1 Variable selection and Sources of data: Data on lending rate (LR), deposit rate (DR), per capita employment cost (PCEC), profitability ratio (PFR), ratio of net non-performing loan to total loans (NPL) of commercial banks, national saving interest (INSI) rates were collected from various publications of Bangladesh Bank (central bank of Bangladesh). Data on the ratio of money supply to GDP (MSGDP) were collected from World Development Indicators (WDI) of World Bank spanning fiscal year 1997-1998 to 2019-2020.

3.2 Model Specification: This research employed the time series regression method for empirical analysis of the lending rate on other regressors that are identified in the literature review.

The model can be specified implicitly as follows:

$$LR_t = f(DR_t, PCEC_t, PFR_t, NPL_t, INSI_t, MSGDP_t, Z_t)$$

where LR_t = lending rate at year t , DR_t = deposit rate at year t , $PCEC_t$ = per capita employment cost at year t , PFR_t = profitability ratio of commercial bank at year t , NPL_t = ratio of net non-performing loan to total loans at year t , $INSI_t$ = national saving interest at year t , $MSGDP_t$ = ratio of money supply to GDP at year t , and Z_t = variables which are not included in the model at that time t .

Following Rouf and Chowdhury (2015), this paper developed the lending rate model for Bangladesh explicitly as:

$$LR_t = \alpha_0 + \beta_1 DR_t + \beta_2 PCEC_t + \beta_3 PFR_t + \beta_4 NPL_t + \beta_5 INSI_t + \beta_6 MSGDP_t + Z_t$$

Before analysis of the data, the variables were tested by the Augmented Dickey Fuller (ADF) test to ensure whether the variables have unit root or not.

3.3.1 Testing the Unit Root: According to Engle and Granger (1987), most of the time series in macroeconomic variables are non-stationary at levels. Therefore, in order to seek for proper methodology to establish the economic relationship among the macroeconomic variables, checking stationarity of the variables is required for time series data. Otherwise, the results of the regression will be spurious (nonsense). A variable is said to be stationary if its ADF values larger than the critical values.

Then, cointegration test was used to identify whether long run equilibrium relationship exists among the selected variables or not.

3.3.2 Testing the Cointegration: In cointegration test, null hypothesis is a series that are not cointegrated whereas alternative hypothesis is a series of cointegration among the selected variables. If the linear

combination of selected time series variables is integrated of order 1 i.e., $I(1)$, then the variables will be stationary as well as cointegrated at first difference. This implies that, in the short run, time series variables may fluctuate from one another; however, they will proceed to gather in the long run. In order to examine whether the long run equilibrium relationship exists among the selected variables or not, the Johansen System Cointegration Test for multivariate is used.

In time series analysis, cointegrating regression model only pay attention to the long-run equilibrium relations, and does not consider any short-run dynamics explicitly. However, time series modeling is not only for short run dynamics but also for long run equilibrium relationship simultaneously. Therefore, in order to test the presence of cointegration and to estimate the long-term and short-run coefficients jointly, the method of bounds testing procedure first introduced by Pesaran and Shin (1999) and later developed by Pesaran, Shin, and Smith (2001) are carried out. This bound testing approach has two main advantages while comparing with other cointegration techniques. First, the underlying regressors do not necessarily require only $I(0)$ or only $I(1)$ or mutually $I(1)$ by the bounds test. Second, the bounds test might be applicable even in a very small sample size. The statistic regarding this technique is Wald-statistic or F-statistic, which is a similar kind of generalized regression by Dickey-Fuller. This statistic is generally applied for testing the lag level of variables significantly. If the calculated value of F-statistic falls outside the range of critical bounds, then null hypothesis of no cointegration i.e., there is no relation among the selected variables in the long run is rejected. Next, if the relationship in the long run is found, a two-step procedure will be carried out in the next stage in order to estimate the model. This recent cointegration technique, autoregressive distributed lag (ARDL) model, is initiated by Pesaran et al. (2001). In the initial step, the lag length of the ARDL model is determined by using an appropriate lag selection criterion and in the next step, the selected model is estimated by the technique of ordinary least squares (OLS).

Following Halicioglu (2004), the general ARDL considering short-run and long-run jointly takes the form as

$$\begin{aligned} \Delta LR_t = & \mu + \sum_{i=1}^n \alpha_i \Delta LR_{t-i} + \sum_{i=0}^n \beta_i \Delta DR_{t-i} + \sum_{i=0}^n \gamma_i \Delta PCEC_{t-i} + \sum_{i=0}^n \delta_i \Delta PFR_{t-i} + \sum_{i=0}^n \theta_i \Delta NPL_{t-i} \\ & + \sum_{i=0}^n \vartheta_i \Delta INSI_{t-i} + \sum_{i=0}^n \pi_i \Delta MSGDP_{t-i} + \alpha LR_{t-1} + \beta DR_{t-1} + \gamma PCEC_{t-1} + \delta PFR_{t-1} \\ & + \theta NPL_{t-1} + \vartheta INSI_{t-1} + \pi MSGDP_{t-1} + \varepsilon_t \end{aligned}$$

Where μ and ε_t are assumed to be drift component and white noise error process respectively.

However, the reliability of the results based on ARDL model should be tested by diagnostic tests and stability tests.

3.4 Testing the Reliability and Sensitivity of the model:

3.4.1 Diagnostic tests: Lagrange multiplier (LM) test is used for serial correlation of residuals, which is also known as the Breusch-Godfrey (BG) test. The advantage of BG test over Durbin-Watson (DW) test is that it allows not only non-stochastic regressor such as lag values of the regressand but also higher-

order autoregressive schemes, for instance AR (1), AR (2) etc. Moreover, moving averages of white noise error terms for higher order can also be tested by BG test. The null and alternative hypotheses of the test are as follows:

H_0 : No serial correlation versus H_1 : There exists serial correlation

Ramsey's regression specification error (RESET) test is used for measuring misspecification of the functional form. The null and alternative hypotheses related to Ramsey's RESET are given below:

H_0 : Model is not mis-specified against H_1 : Model is mis-specified

The advantage of using the Ramsey's RESET test is that it is easy to apply and there is no need to specify alternative model.

In time series regression, it is better to test autoregressive conditional heteroscedasticity (ARCH) effect before accepting Durbin-Watson d statistic value for testing heteroscedasticity. The ARCH test is used to check whether the model pass the diagnostic test or not. Therefore, the null and alternative hypotheses are as follows:

H_0 : Homoscedasticity whereas H_1 : Heteroscedasticity

3.4.2 Stability tests: In long time series data, it is common to have one or multiple structural breaks. In this connection, the consistency of short-term and long-term coefficients is tested using the cumulative sum (CUSUM) and the cumulative sum (CUSUM) square tests, which were suggested by Brown et al. (1975). Lending rate (LR) as dependent variable is presented in the plot of CUSUM test statistic that falls between the critical bounds at 5% significance level, which confirms that the estimated parameters are reliable over the period 1998-2020.

4. Empirical Results

4.1 Testing the Unit Root: The descriptive statistics of the selected variables carried out at the very beginning helped observe the sample property. Moreover, correlation analysis was conducted to investigate whether any co-movement among the selected variables exist or not. In the second step, test of stationarity was carried out applying the ADF test, which shows that among the selected variables, deposit rate (DR), ratio of net non-performing loan (NPL) to total loans are stationary at level i.e., I (0), and lending rate (LR), per capita employment cost (PCEC), profitability ratio (PFR), national saving interest (INSI) and ratio of money supply to GDP (MSGDP) are stationary at first order difference i.e., I (1). Therefore, if we regress lending rate (LR) on other variables by using Ordinary Least Squares (OLS), then the estimated coefficients of LR at level will be spurious. Consequently, it is better to test the cointegration before estimating the coefficients.

4.2 Testing the Cointegration: Since the null hypothesis that means time series is non-stationary, which was rejected on the basis of ADF test, consequently the time series data of selected variables are integrated of order 1 i.e., I(1). This means that there exists a long run linear relationship among the variables. Therefore, to establish whether the long run equilibrium relationship exists among the selected

variables or not, the Johansen System Cointegration Test for multivariate is carried out, which shows both Trace test and the test of maximum Eigen value with 5 cointegrating equations at 5% level of significance. Therefore, the Johansen System Cointegration Test for multivariate indicates same result with trace test and test for maximum Eigen values because both tests which indicate 5 cointegration relations. However, the Johansen cointegration test for cointegration does not provide which variables have the long-run relationship. Hence, it is desired to run ARDL following the methodology in subsection 3.3.2. However, it is imperative to select lag through lag selection criteria before analyzing ARDL.

Table 3 Estimation results of ARDL controlling MSGDP, FY 1997-98 to 2018-19

Regressor	<i>Model 1</i>	Dependent Variable: Lending rate (LR)			
		<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>
DR Long-run	1.32*				
	(0.00)				
Short-run	1.00*				
	(0.00)				
PCEC		49.32			
		(0.71)			
		8.35			
		(0.37)			
PFR			11.80***		
			(0.08)		
			-4.48		
			(0.59)		
NPL				0.21***	
				(0.08)	
				-0.10**	
				(0.03)	
INSI					1.42
					(0.68)
					0.56
					(0.30)

Source: Author's own calculation

Where *, ** and *** denote at 1%, 5% and 10% level of significance respectively.

The estimation results shown in Table 3 are obtained from ARDL using Lending rate (LR) as response and other variables as stimulus after controlling the ratio of money supply to GDP. The first row indicates the different models while using different exogenous and the rest of the rows show the coefficients in the long-run and short-run with respective p-values in the brackets.

The coefficient $\hat{\beta} = 1.32$ in the second column of Table 3 indicates positive relationship between lending rate and deposit rate in the long-run which is expected. Moreover, there exists short-run positive relation

between lending rate and deposit rate as $\widehat{\beta}_0 = 1.00$, which indicates that if deposit rate increases by 1 percent in the short-run, the lending rate will be increased by 1.00 percent at 1% level of significance.

In the third column of Table 3, the coefficient $\widehat{\gamma} = 49.32$ shows expected positive relation between lending rate and per capita employment cost in the long-run after controlling the ratio of money supply to GDP. As there exists long-run equilibrium relationship between lending rate and per capita employment cost, the short-run relationship has been observed and found the coefficient $\widehat{\gamma}_0 = 8.35$ which is insignificant.

In the fourth column of Table 3, the long-run profitability ratio of schedule banks is $\widehat{\delta} = 11.8$ which shows that if profitability ratio increases by 1 percent, then lending rate will be increased by 11.8 percent and it is significant at 10% level of significance. However, profitability ratio of schedule banks in the short-run is insignificant as p-values are exceeded compared to the level of significance. It might happen due to competitiveness of the commercial banks while setting lending rate in the short-run.

The coefficient of ratio of non-performing loan to total loans in the fifth column of Table 3 is estimated from Model 4. The coefficient $\widehat{\theta} = 0.21$ shows the positive relation between lending rate and ratio of non-performing loan to total loans in the long-run. Therefore, if the ratio of non-performing loan to total loans increases by 1 percent, the lending rate will rise by 0.21 percent in the long-run at 10% level of significance. However, in the short-run, the estimated coefficient $\widehat{\theta}_0 = -0.10$ which shows unexpected negative relation between lending rate and ratio of non-performing loan to total loans. The reason behind this negative relation is that sometimes banks reschedule the non-performing loans after taking down payment and hence decrease the interest rate on lending in the short-run. Consequently, if the ratio of non-performing loan to total loans increases by 1 percent, the lending rate decreases by 0.10 percent in the short at 1% level of significance due to reschedule. When banks fail to recover the bad loans in the long-run, the lending rate is increased by the banks.

The coefficient of national saving interest is insignificant both in the long-run and long-run. As Government impose 10% income tax (dated 2 July 2019) on National Savings Certificate (NSD) under Income Tax Ordinance, 1984 Section 52D, hence saving interest is insignificant on lending rate determination.

Now, ARDL model is estimated (presented in appendix in table 4 and table 5) considering all covariate and presented below:

Table 4. The result of Cointegration Test using ARDL, FY 1997-98 to 2018-19

Panel I: Bounds Testing to Cointegration	
Estimated Model	$f(LR_t, DR_t, PCEC_t, PFR_t, NPL_t, INSI_t)$
Optimal Lag Length	(1, 1, 1, 10, 0, 0)
F-statistics	4.30**

Critical Values (T=21)

	Lower Bounds I(0)	Upper Bounds I(1)
1 percent level	4.134	5.761
5 percent level	2.91	4.193
10 percent level	2.407	3.517
<hr/>		
Panel II: Diagnostic tests	Statistics	P-value
R ²	0.981054	-
Adjusted R ²	0.9655	-
F-statistics	63.2876*	0.0000
Breusch –Godfrey LM test	1.3572	0.3054
ARCH test	0.4837	0.4957
Ramsey RESET	0.1805	0.6799
CUSUM	Stable	-
CUSUM _{sq}	Stable	-

Source: Author's own calculations

where *,** and *** indicate significance levels at 1%, 5% and 10% respectively.

Table 5. Long run Results and Their Robustness, FY 1997-98 to 2018-19

Independent Variable	Dependent Variable LR	
	ARDL coefficient	P-value
Constant	1.2718	0.4134
DR	1.1971*	0.0000
PCEC	-1.0524	0.1471
PFR	4.8963	0.1539
NPL	0.0614**	0.0108
INSI	0.0910	0.2610

Source: Author's own calculations.

Note: * and ** indicate the significance at 1% and 5% levels.

In panel II of table 4, the LM statistics satisfy no serial correlation of accepting H_0 at 1% level of significance as $p\text{-value} > \text{level of significance}$.

Following the methodology, the ARCH test and Ramsey RESET test explain that there is no heteroscedasticity and misspecification in the selected model.

In table 4, the parameter consistency based on CUSUM and CUSUMsq plot show that they are stable at 5% level of significance under the critical bound, which is shown in appendix in graph 1.

The estimation results, shown in Table 5, indicate that the coefficient of deposit rate (DR) is statistically significant at 1% level of significance with expected sign as the probability value is 0.0000. Moreover, the coefficient of ratio of net non-performing loan (NPL) to total loans is statistically significant at 5% level of significance with expected sign as the probability value is 0.0108.

The result shows that there exists a positive relationship between the lending rate (LR) and deposit rate (DR) in the banking sector. This means if DR increases, it leads to an increase in lending rate. If deposit

rate (DR) is increased by 1 percent, then in the long run the lending rate (LR) is increased by 1.1971 percent at 1% level of significance under ceteris paribus. As LR is the yardstick of loan transaction, therefore, commercial banks depend on DR (the less, the better) in order to accelerate loan disbursement or investment, which improves the overall macroeconomic situation of the country.

The most important key factor for determining lending rate is the non-performing loan or bad loan. This variable is included in the analysis because the concept of collecting data on that variable comes in 1990s. Considering the situation, which is worsening continuously, government has taken initiatives to collect the data. In the long-term, if the net non-performing loan (NPL) to total loans is increased by 1 unit, the lending rate (LR) is increased by 0.0614 percentage point. Therefore, it causes the high lending rate in the banking sector.

Since there exists long-run equilibrium relationship among the selected variables, it is necessary to analyze the short-run relationship. In this connection, error correction mechanism (ECM) was carried out to tie the short-run behavior of variables to its long-run.

Table 6. Short run Results, spanning Fiscal Year 1997-1998 to 2018-2019

Panel I		Dependent Variable LR	
Variable	Coefficient	T-Statistics	P-value
Constant	-1.4080	-6.8199	0.0000
ΔDR_t	1.0721 *	14.8183	0.0000
$\Delta PCECR_t$	-10.3491	-5.4519	0.0002
ΔPFR_t	1.5102	0.8740	0.4008
R^2	0.9400	-	-
Adjust R^2	0.9294	-	-
D.W stat	1.9869	-	-
Panel II: Test		χ^2 -statistics	P-value
χ^2 Serial		4.8662	0.0878
χ^2 ARCH		0.5233	0.4694
χ^2 Hetero		16.7663	0.1150
χ^2 Reset		0.3758	0.5398

Source: Author's own calculations.

Note: χ^2 Serial is the Breusch-Godfrey-Pagan LM test statistic for testing no serial correlation, χ^2 ARCH is used to test “no autoregressive conditional heteroscedasticity” by the Engle’s test statistic, χ^2 Hetero test statistic is used for testing the heteroscedasticity and χ^2 Reset is the Ramsey’s test statistic for testing misspecification of the functional form. Also, *, ** and *** indicate the significant levels at 1%, 5% and 10% respectively.

In Table 6, $\widehat{\beta}_0 = 1.0721$ shows that 1 percent increase in deposit rate in the short-run at period t leads to an increase 1.0721 percent in lending rate in the short-run at period t under ceteris paribus and this increment is statistically significant at 1% level of significance.

The short-run coefficient of per capita employment cost is significant but unexpectedly negative due to shock such as technology import, training to improve skills of employee etc. However, it is insignificant in the long-run.

The adjusted R^2 is quite high in the short run model as shown in Column 2 of Table 6. However, the dominance of return on asset, excess reserve ratio, Cash Reserve Requirements (CRR), lack of user-friendly environment for investment, political instability and other factors which are non-economic may play considerable role for adjusted R^2 .

Considering the data from fiscal year 1997-98 to 2019-20, we get the results as follows:

Table 7. The result of Cointegration Test using ARDL, FY 1997-98 to 2019-20

Panel I: Bounds Testing to Cointegration		
Estimated Model	$f(LR_t, DR_t, PCEC_t, PFR_t, NPL_t, INSI_t)$	
Optimal Lag Length	(1, 0, 0, 0, 0, 0)	
F-statistics	12.24**	
Critical Values (T=22)		
	Lower Bounds I(0)	Upper Bounds I(1)
1 percent level	3.9	5.419
5 percent level	2.804	4.013
10 percent level	2.331	3.417
Panel II: Diagnostic tests		
	Statistics	P-value
R ²	0.9569	-
Adjusted R ²	0.9398	-
F-statistics	55.5947*	0.0000
Breusch –Godfrey LM test	0.8704	0.5387
ARCH test	0.2114	0.6508
Ramsey RESET	0.3673	0.5542
CUSUM	Stable	-
CUSUM _{sq}	Stable	-

Source: Author's own calculations

where *, ** and *** indicate significance levels at 1%, 5% and 10% respectively.

Table 8. Long run Results and Their Robustness, FY 1997-98 to 2019-20

Independent Variable	Dependent Variable LR	
	ARDL coefficient	P-value
Constant	2.007	0.5902
DR	1.3035	0.0000
PCEC	-3.0747	0.0982
PFR	1.6600	0.8128
NPL	0.0265	0.5587
INSI	0.1014	0.6156

Source: Author's own calculations.

Note: * and ** indicate the significance at 1% and 5% levels.

Table 9. Short run Results, spanning Fiscal Year 1997-1998 to 2019-2020

Panel I		Dependent Variable LR	
Variable	Coefficient	T-Statistics	P-value
Constant	1.6222	0.5220	0.6093
DR _t	1.0534*	4.6717	0.0003
PCECR _t	-2.4848	-1.8073	0.1090
PFR _t	1.3415	0.2458	0.8092
NPL _t	0.0214	0.6078	0.5524
INSI _t	0.0819	0.5583	0.6050
R ²	0.8346	-	-
Adjust R ²	0.8346	-	-
Panel II: Test		χ^2 -statistics	P-value
χ^2 Serial		1.2212	0.5430
χ^2 ARCH		0.2312	0.6307
χ^2 Hetero		5.6813	0.4598
χ^2 Reset		0.5697	0.4504

Source: Author's own calculations.

Note: χ^2 Serial is the Breusch-Godfrey-Pagan LM test statistic for testing no serial correlation, χ^2 ARCH is used to test “no autoregressive conditional heteroscedasticity” by the Engle's test statistic, χ^2 Hetero test statistic is used for testing the heteroscedasticity and χ^2 Reset is the Ramsey's test statistic for testing misspecification of the functional form. Also, *, ** and *** indicate the significant levels at 1%, 5% and 10% respectively.

From Table 8 and Table 9, we found that all the coefficients except deposit rate have no impact after inclusion of FY20 data. It might happen as lending rate was administered by Banking Regulation and Policy Department of Bangladesh Bank through issuing a circular regarding interest rate on lending dated 24 February 2020. In this circular, the lending rate was set not more than 9% for all loans and advances except credit card with effective from 1 April, 2020. This capping on the lending rate may affect its determinants.

5. Conclusion

Interest rate on lending is one of the important tools of a modern banking system, which greatly impacts economy. The higher the rate of interest on loans the lower will be the investment and thereby it will negatively impact the economic growth. This study attempts to investigate the possible factors that are liable for persistent high lending rate in Bangladesh. The annual data of the variables – deposit rate, per capita employment cost of schedule banks, profitability ratio of commercial banks, ratio of non-performing loan to total loans, national saving interest, ratio of money supply to GDP were used as

explanatory variables, following theoretical evidence of lending rate determinants from different countries. Several time series econometric techniques such Augmented Dickey Fuller test for testing unit root, Johansen Cointegration test for long-run equilibrium relation, Auto Regressive Distributed Lag (ARDL) model for estimating coefficients were employed. This research found that deposit rate and ratio of non-performing loan to total loans have impact on lending rate determination in Bangladesh both in the short-run and long-run after controlling the ratio of money supply to GDP and considering data from fiscal year 1997-98 to 2018-19. For instance, if deposit rate increases by 1 percentage then the lending rate will be increased by 1.32 percentage points in the long-run which is statistically significant at 1% level of significance. If the net ratio of non-performing loan to total loans increases by 1 percent, the lending rate will rise by 0.21 percentage point in the long-run at 10% level of significance. Moreover, profitability ratio has long-run impact on lending rate determination in Bangladesh. Furthermore, the paper found that deposit rate in both the long-run and short-run has an impact on lending rate whereas ratio of non-performing loan to total loans has only the long-run affect behind lending rate in the banking sector. Therefore, deposit rate, profitability ratio, and net non-performing loan to total loans are the determinants of commercial banks' lending rate in Bangladesh. These findings will help not only the Central Bank of Bangladesh and commercial banks but also the policy makers as well as government to take bank lending rate policy after fine-tuning its determinants. Moreover, based on the above findings, the following recommendations should be taken regarding lending rate so that lending rate becomes conducive to investment and continuous economic growth in Bangladesh.

Policy recommendations:

- Since higher profitability ratio is one of the factors that are liable for high lending rate. Therefore, the management should think how to reduce profitability for the welfare of the society. After controlling the ratio of money supply to GDP, in the long-run, if management decreases profitability ratio by 1 percent, the lending rate will be decreased by 11.8 percent which is statistically significant at 10% level of significance.
- It is imperative to strengthen bank governance for improving asset quality because high stock of non-performing loan is a concern in the banking sector. The high ratio of net non-performing loans to total loans reflects financial inefficiency, which should be improved through strengthen the financial intermediaries. As the net ratio of non-performing loan to total loans increase by 1 percentage point the lending rate will rise by 0.0614 percentage point in the long-run. Hence, a stable and capable financial institution is required for higher investment. In this connection, Credit Information Bureau (CIB) should be improved to help banks for better assessment of borrower creditworthiness. Volume of investment should be increased in the quality of lending. Moreover, it is essential to give power to the bank for taking legal action for NPL or bad loan collections, foreclosures without injecting stay order for loan default from the Supreme Court.
- Total volume of saving should be increased by increasing saving rate in order to boost up investment rate.

- In the analysis, deposit rate of the banks is found to have impact on lending rate considering both data samples (FY98 to FY19 and FY98 to FY20). The reason behind the impact is that there is no cap on deposit rate in both samples, while analyzing data. However, after the cap on lending rate introduced by the government on 24 February 2020 with effect from 1 April 2020, all the variables except deposit rate have found no impact on lending rate, seemingly capping on lending has impact on the market channel. Therefore, why the variables have no impact on lending rate while capping of lending interest rate can be an issue of further research.

Appendix

Table 1

Fiscal Year	Total Credit	Credit Growth (%)	Excess Reserve	Lending Rate
2003-2004	119889.6	-	-	-
2004-2005	140409.3	17.12	373.06	10.93
2005-2006	162842.7	15.98	387.33	12.06
2006-2007	189391.1	16.30	563.42	12.78
2007-2008	235732.9	24.47	56.43	12.29
2008-2009	275025.1	16.67	9027.46	11.87
2009-2010	334654.8	21.68	4726.46	11.23
2010-2011	422475.7	26.24	4051.76	12.37
2011-2012	507085	20.03	2831.48	13.88
2012-2013	583077.7	14.99	2035.41	13.61
2013-2014	670166.3	14.94	501.56	13.06

Source: Monthly Economic Trends (Time series data since 1972),
Statistics Department, Central Bank of Bangladesh.

Table 2

ARDL Long Run Form and Bounds Test

Dependent Variable: D(LR)

Selected Model: ARDL(1, 1, 1, 1, 0, 0)

Case 2: Restricted Constant and No Trend

Date: 02/04/21 Time: 13:57

Sample: 1998 2019

Included observations: 21

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.790615	2.212213	0.809422	0.4354
LR(-1)*	-1.407974	0.274324	-5.132529	0.0003
DR(-1)	1.685512	0.358113	4.706643	0.0006
PCEC(-1)	-1.481715	0.988047	-1.499639	0.1619
PFR(-1)	6.893852	4.436396	1.553931	0.1485
NPL**	0.086481	0.031891	2.711800	0.0202
INSI**	0.128161	0.105464	1.215216	0.2497
D(DR)	1.072074	0.170743	6.278870	0.0001
D(PCEC)	-10.34911	4.654539	-2.223444	0.0481
D(PFR)	1.510203	3.889326	0.388294	0.7052

* p-value incompatible with t-Bounds distribution.

** Variable interpreted as $Z = Z(-1) + D(Z)$.

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DR	1.197118	0.082720	14.47194	0.0000
PCEC	-1.052373	0.674689	-1.559791	0.1471
PFR	4.896291	3.197499	1.531288	0.1539
NPL	0.061422	0.020067	3.060847	0.0108
INSI	0.091025	0.076824	1.184847	0.2610
C	1.271767	1.496215	0.849989	0.4134
EC = LR - (1.1971*DR -1.0524*PCEC + 4.8963*PFR + 0.0614*NPL + 0.0910 *INSI + 1.2718)				
F-Bounds Test				
Null Hypothesis: No levels relationship				
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.299308	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Finite Sample: n=35				
Actual Sample Size	21	10%	2.331	3.417
		5%	2.804	4.013
		1%	3.9	5.419
Finite Sample: n=30				
		10%	2.407	3.517
		5%	2.91	4.193
		1%	4.134	5.761

Table 3

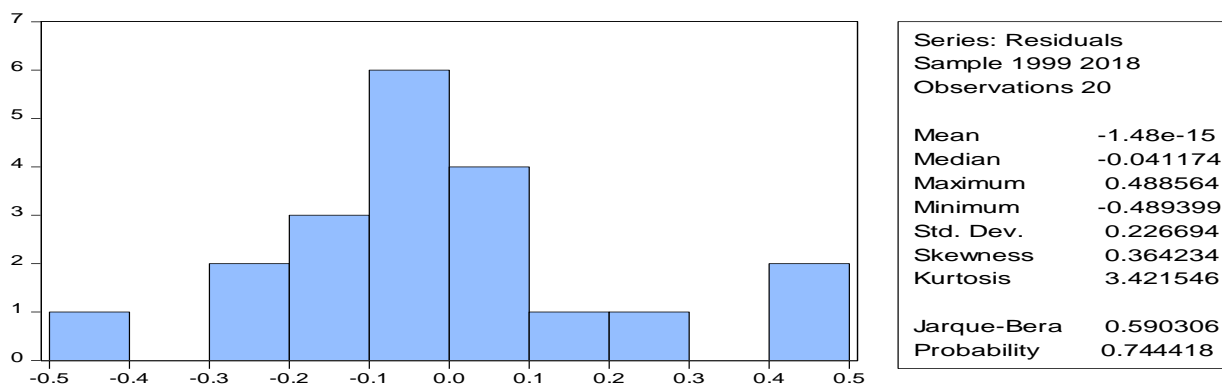
ARDL Error Correction Regression
Dependent Variable: D(LR)
Selected Model: ARDL(1, 1, 1, 1, 0, 0)
Case 2: Restricted Constant and No Trend
Date: 02/04/21 Time: 14:31
Sample: 1998 2019
Included observations: 21

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DR)	1.072074	0.072348	14.81834	0.0000
D(PCEC)	-10.34911	1.898272	-5.451856	0.0002
D(PFR)	1.510203	1.727829	0.874047	0.4008
CointEq(-1)*	-1.407974	0.206452	-6.819875	0.0000
R-squared	0.940026	Mean dependent var		-0.211429
Adjusted R-squared	0.929443	S.D. dependent var		0.816506
S.E. of regression	0.216885	Akaike info criterion		-0.049253
Sum squared resid	0.799667	Schwarz criterion		0.149703
Log likelihood	4.517161	Hannan-Quinn criter.		-0.006075
Durbin-Watson stat	1.986901			

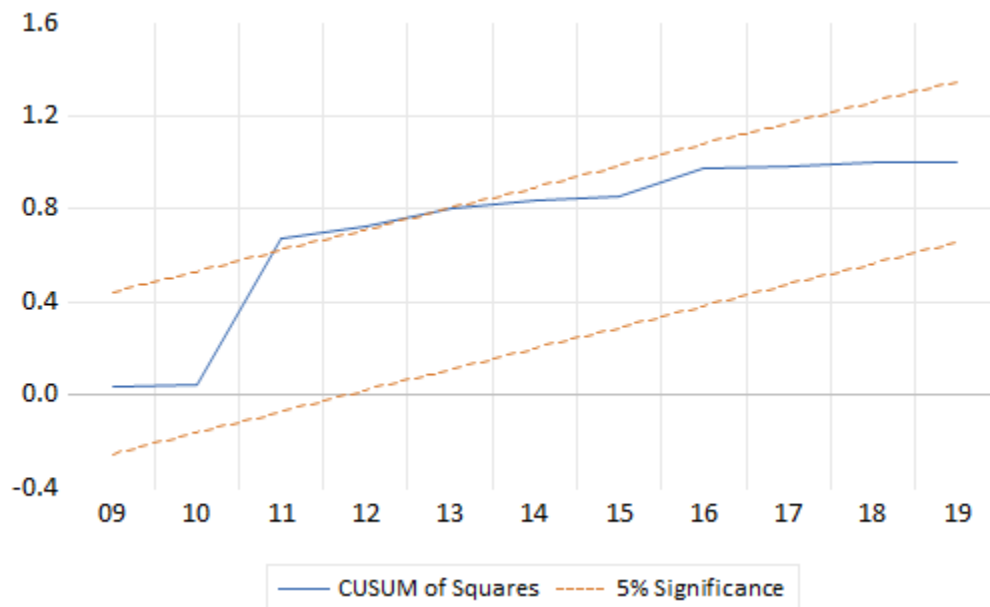
* p-value incompatible with t-Bounds distribution.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.299308	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Chart 1



Graph 2



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Chief Economist's Unit
Bangladesh Bank, Head Office, Dhaka, Bangladesh

Bangladesh Bank welcomes suggestions and comments for improvement of the contents and form of this publication. Comments and suggestions may be sent to: ezazul.islam@bb.org.bd

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