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Recent Experiences in the Foreign Exchange and Money Markets

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Abstract

Over the last two fiscal years both the foreign exchange and the money markets in Bangladesh experienced notable volatility, which resulted in substantial depreciation of BDT against major currencies and a temporary rise in the interest rate in the money market. This paper attempts to analyze the underlying causes and impact of the recent developments in the foreign exchange and money markets. It is observed that, depreciation and volatility of exchange rate depends on various components of foreign exchange market; for example, when the gap between the monthly flow of imports and exports widens or the demand for opening import LCs rises, the exchange rate tends to depreciate. Similarly, volatility of the exchange rate appears to move in tandem, with the two aforementioned pressures. On the other hand there is high positive correlation between exchange rate and average call money rate and between volatility of exchange rate and that of call money rate, which signal that temporary instability in one market can generate pressure in the other market. These findings are tentative but they deserve careful review in fine tuning the day-to-day management of the policy stance.

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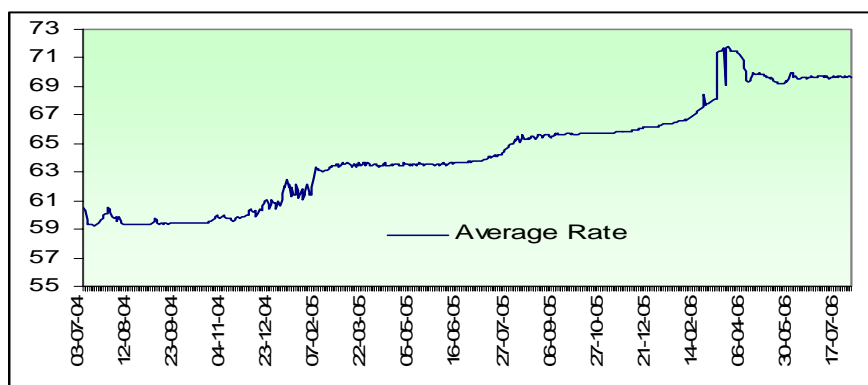
1. Background

An in-depth analysis of the relationship between foreign exchange and money markets is an important issue for the policy makers, as any policy changes in one market can affect the movements in the other market significantly. An increase in interest rates in the money market tends to alleviate the depreciating pressure on the domestic currency in the foreign exchange market and a depreciating pressure in the foreign exchange market tends to aggravate an upward pressure in the money market. Therefore, an analysis of the movements in the foreign exchange and money markets, particularly the mechanism of volatility transmission between foreign exchange and money markets is vital for effective policy making. Available data for the last two fiscal years indicate that both the foreign exchange and the money markets in Bangladesh experienced notable volatility, which resulted in substantial depreciation of BDT against major currencies along with persistent inflationary pressure and a temporary rise in the interest rate, call money rate in particular, in the money market. This paper attempts to analyze the underlying causes and impact of the recent developments in the foreign exchange and money markets with a special attention to the policy implications.

2. Behaviour of the Foreign Exchange Market

During the early stage of the floatation, the foreign exchange market in Bangladesh remained largely stable with low volatility and minimal depreciation of Taka against major currencies due to the sound transition to the floating regime facilitated by the adequate preparatory steps taken by Bangladesh Bank and the then low inflationary global economic environment.¹ From June '03 to April '04 the BDT/USD exchange rate remained fairly stable while during FY05 it experienced substantial depreciating pressure.

Figure 1: Daily Exchange Rate (weighted average)



Source: Monetary Policy Department, Bangladesh Bank.

Despite significant growth of remittances and exports and a moderating growth in overall imports, BDT maintained its depreciating trend against USD during the first three quarters of FY06 due to a combination of high cost of energy imports, bunching of LC settlements, and deficits in the income and services components of the current account. The fourth quarter however was relatively calm. While the volume of imports is stimulated by internal demand reflecting broad based expansion of economic activities, the cost of imports reflects higher commodity prices, especially oil, in the international markets. The weighted average BDT/USD exchange rate stood at BDT 69.65 at the end of FY06 from BDT 63.68 in the same period of the previous year reflecting 8.56 percent depreciation over the year². The weighted average

¹ Note that the BDT went into a floating exchange rate regime on May 31, 2003.

² These are weighted average exchange rate in the inter-bank foreign exchange market.

BDT/USD exchange rate reached its peak at BDT 71.75 in the inter-bank foreign exchange market on 21st March '06 and fluctuated within the range of BDT 66.20-71.75 with the average rate of BDT 68.07 per Dollar during January–March '06. The average volume of transactions was USD 12 million per day in the same quarter. During the corresponding period of FY05, BDT/USD rate varied within the range of BDT 60.59-63.67 with the average rate and volume of transactions of BDT 62.8 per Dollar and USD 13.3 million per day respectively.

Based on monthly movements, the BDT/USD exchange rate witnessed the highest level of volatility since the floatation in March '06 resulting in a depreciation of about 4.57 percent over the previous month.³ Afterwards, the depreciating pressure on the Bangladeshi currency eased significantly and remained stable during April-June '06 period reflecting a sizeable supply of foreign currency emanating from the export growth and the growing inflow of workers' remittances. The volatility of BDT/USD exchange rate as measured by standard deviation reached 2.04 in the third quarter of FY06 vis-à-vis 0.91 in the same quarter of FY05 (Table 1).⁴

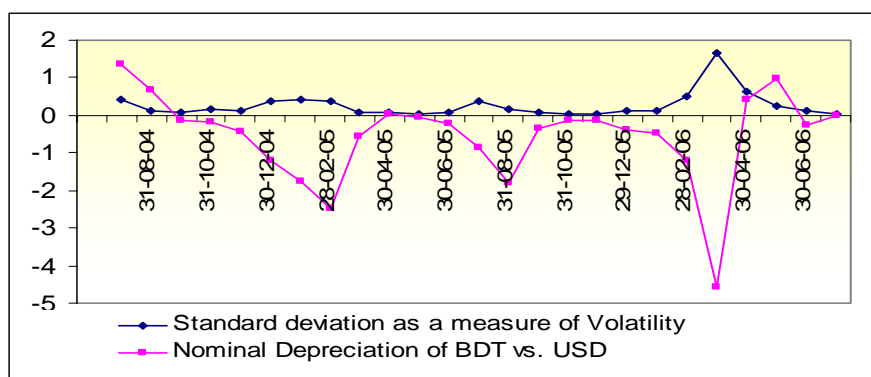
Table 1: Quarterly Statistics of BDT/USD Exchange Rate

	AVG	MAX	MIN	ST. DEV
Jul-Sep FY05	59.52	60.51	59.26	0.30
Oct-Dec FY05	59.97	61.09	59.45	0.49
Jan-Mar FY05	62.80	63.67	60.59	0.91
Apr-Jun FY05	63.59	63.75	63.39	0.09
Jul-Sep FY06	65.06	65.71	63.76	0.67
Oct-Dec FY06	65.87	66.21	65.66	0.17
Jan-Mar FY06	68.07	71.75	66.20	2.04
Apr-Jun FY06	69.74	71.38	69.16	0.48

Source: Authors' calculation

Although, the direct intervention in the foreign exchange market under the floating exchange rate regime has largely been avoided, the central bank does intervene in the market by selling and purchasing foreign currency to bring an orderly adjustment in the exchange rate. Indeed, Bangladesh Bank bought and sold respectively USD 77.0 million and USD 413.0 million reflecting a net injection of USD 336.0 million in the inter-bank foreign market during FY06.

Figure 2: Co-movement of Volatility and Depreciation



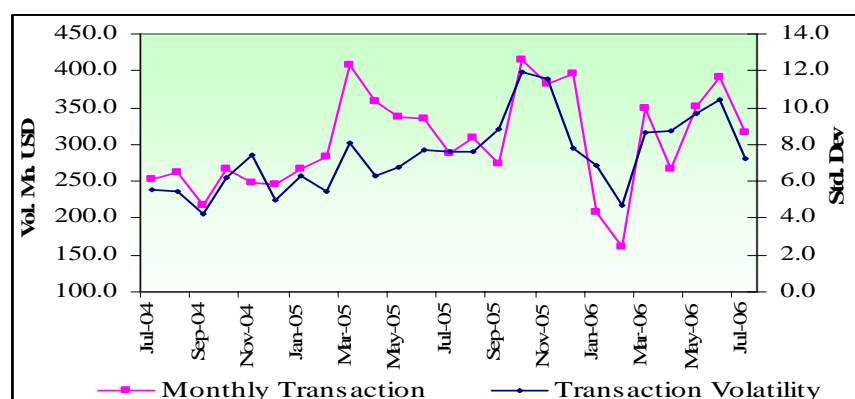
Source: Authors' calculation

³ In line with nominal exchange rate depreciation, the Real Effective Exchange Rate (REER) index also depreciated marginally from 89.72 in February FY05 to 89.43 in February FY06.

⁴ Note that the standard deviation in the exchange rate during January-March period appears to be larger in every year indicating some sort of seasonality in the movements of the BDT/USD exchange rate.

Relatively higher inflow in the fourth quarter has improved the liquidity condition in the inter-bank market relieving the pressure on the exchange rate. Furthermore, banks were very successful in keeping the foreign liabilities within the tolerable limits during this period, which also helped in maintaining a proper balance between supply and demand. It is observed that there is a strong negative relationship, namely that high volatility is matched by significant currency depreciation. The correlation coefficient is -0.67. Further, it is seen that there is a strong positive relationship between the volume of foreign exchange transactions and transaction volatility with a correlation coefficient of 0.82 during FY05-06 (Figures 2-3).

Figure 3: Monthly Volume of Transactions (USD) and Transactions Volatility



Source: Authors' calculation

3. Possible Explanation of Exchange Rate Movements

The behavior of exchange rate movements depends on the demand and supply of foreign currency which itself is determined by the interactions of different parts of the market. Below an attempt is being made to explain the recent movements in the exchange rate in terms of changes in different segments of the foreign exchange market as well as the money market factors.

(a) Movements of the Foreign Exchange Market Variables

It is observed that trade as well as the overall balance improved significantly in FY06 over FY05 reflecting about USD 418 million reduction in trade deficits and about USD 300 million rise in the overall balance of payments surplus. This behavior has been driven both by the rise in exports (21.5 percent) and remittances growth (24.8 percent). Despite recent payments made through the Asian Clearing Union (ACU) and the declining trend in the foreign aid, the Gross International Reserves (GIR) position continued to maintain its upward trend in the last three financial years. GIR position reached its record high of about USD 3.48 billion at the end of June '06, which was USD 2.93 billion and USD 2.71 billion, respectively, at the end of FY05 and FY04.

However, the observed pressure in foreign exchange market over the last two fiscal years has plausibly been caused by seasonal pattern in the flow of imports and exports and bunching of LC openings coupled with shortfalls in income and service accounts. The gap between the flow of imports and exports reached more than 500 million USD during March-April '06. In February '06 import payments increased by USD 62.2 million and exports reduced by USD 32.54 million over the previous month. This was further exacerbated in March '06 due to a sharp rise in import payments (184 million USD) and a relatively modest rise in export earnings. The gap was more than USD 550 million during March-April '05. It is also observed that the import LCs opened in March '06 is USD 202.1 million higher than the monthly average of the same year and 10.58 percent higher over its previous month. Similarly for March '05, the LC-level rose by USD 251.8 million or 22.8 per cent higher over the previous month. It is evident that in both the last two fiscal years there was a sharp rise in demand for import LCs and thus precipitating a temporary

instability in the foreign exchange market. Table 2 represents a correlation analysis among the depreciation of BDT/USD exchange rate and volatility of exchange rate along with some important variables, such as monthly Import-Export gap, Import LCs opening, Remittances -as shares of gross foreign exchange reserves.⁵ It is observed that, when the gap between the monthly flow of imports and exports widens or demand for opening import LCs rises (as shares of reserves), the exchange rate of BDT/USD tends to depreciate. In the same way, volatility of the exchange rate appears to move in tandem, with the two aforementioned pressures.⁶

Table 2: Correlation between depreciation, volatility and other foreign exchange market variables

	Depreciation	Volatility	IMEXGAP/ Reserve	LCOP/ Reserve	REM/ Reserve
Depreciation	1				
Volatility	-0.67	1			
IMEXGAP/Reserve	-0.40	0.22	1		
LCOP/Reserve	-0.32	0.45	0.37	1	
REM/Reserve	-0.26	0.41	0.16	0.69	1

Source: Authors' calculation

(b) The Money Market Factors

As mentioned above, the nexus between foreign exchange and money markets is close. An increase in the import payments generates pressure on the exchange rate, which lead to higher credit demand generating pressure in the money market. The consequent increase in the interest rate, on the other hand, limits the expansion of credit and thereby limits the flow of import payments and eases the depreciating pressure on the home currency. With a view to controlling the twin pressure, namely of high inflation and exchange rate depreciation, the monetary authority in Bangladesh continued to pursue a restrained monetary policy stance during FY06. The monetary stance and a relatively higher inflow of foreign reserves led to an improvement of the liquidity condition in the inter-bank foreign exchange market such that the pressure on BDT/USD exchange rate eased significantly in the last quarter of FY06.

4. Movements in the Money Market

The easing of monetary conditions in the fourth quarter of June reflected a large injection of liquidity associated with the seasonal rise in government expenditure. Consequently, on a year-on-year basis, reserve money increased by 28.1 percent in the fourth quarter, substantially higher than 21.5 percent recorded in the third quarter. The large increase in reserve money was propelled by a sizeable increase in net foreign assets (NFA) as well as net domestic assets (NDA) of the Bangladesh Bank. It has also been observed that the broad money growth was relatively lower than the growth of reserve money as money multiplier continued to decline in June '06 partly due to a rise in cash reserve requirement that had come into effect earlier and change in money holding behavior of the public. Despite these effects broad money growth stood at 19.5 percent at the end of June '06, which was substantially higher than the growth of 16.8 percent in the same period of last year.

During the year, the range of average daily call money rates stayed between 4.9 to 40.4 percent where the mean and standard deviation were 11.5 percent and 5.5 respectively. From the beginning of January '06, the range and volatility in the call money rate picked up significantly and remained high till the end of FY06 reflecting the high credit demand with the tight policy stance of the central bank. Movements in the volume of daily transactions indicate that the range remained between BDT 8.9-29.6 billion with the average and standard deviation of BDT 21.3 billion and 4.6 respectively. It has also been observed that the

⁵ Monthly data of IMEXGAP, LCOP, REM and Reserve are taken for FY05 to FY06 to calculate the ratios.

⁶ It is also seen that LC opening and remittance receipts are highly correlated. While no *a priori* relationships is apparent, remittances does facilitate LC opening.

average daily call money rate as well as the volume of transactions were the highest along with very high volatility in March '06 demonstrating a very close linkage among the three indicators (Table 3).

Table 3: Movements in the Inter-bank Call Money Rate and Volume of Transactions

Period	Call Money (Lending) Rate				Daily Volume (In billion Tk.)			
	Max	Min	Avg.	SD	Max	Min	Avg.	SD
FY 2006	40.37	4.93	11.05	6.13	29.62	8.87	21.33	4.61
Jul-05	5.64	4.93	5.42	0.17	18.67	8.87	12.74	2.94
Aug-05	7.96	5.75	6.32	0.61	21.37	12.91	17.40	2.71
Sep-05	7.74	5.87	6.09	0.38	22.63	18.28	20.04	1.25
Oct-05	8.48	6.55	7.23	0.61	23.77	15.82	20.31	2.09
Nov-05	17.23	6.63	8.46	3.09	25.55	16.22	21.88	2.82
Dec-05	10.37	6.65	8.40	0.97	29.30	21.54	24.62	2.23
Jan-06	34.45	10.76	15.61	6.23	29.15	17.38	23.48	3.85
Feb-06	13.38	11.19	12.13	0.67	28.95	21.86	26.11	2.37
Mar-06	40.37	12.46	17.15	7.36	29.62	16.40	25.65	3.08
Apr-06	28.39	18.09	21.63	3.45	25.53	20.44	23.52	1.35
May-06	21.89	10.93	15.15	2.64	27.87	20.82	23.45	2.25
Jun-06	26.02	7.90	12.83	6.46	22.35	17.85	20.36	1.20

Source: Monetary Policy Department, Bangladesh Bank and authors' estimate.

As the excess liquidity fall substantially, the interest rate in the inter-bank call money as well as repo market went up sharply. As the operations of repo and reverse repo are now allowed to take part on a daily basis, the pressure in the call money market eased partially. At the end of March 2006, the repo rates for 3-9 day have stabilized at about 8.25 percent from 8.00 percent in December '05.⁷ Weighted average rates for reverse repo, on the other hand, are displaying an upward trend during FY06. A higher reverse repo rate helped mop-up excess liquidity from banking industry. The weighted average reverse repo rates stood at 6.04 percent and 6.29 percent (more than double) respectively for 1-2 day and 3-11 day in June '06 from 2.50 percent and 2.84 percent in June '05 reflecting much tighter monetary stance in recent year. Much like repo and reverse repo rates, the weighted average yields for various T-bills as well lending and deposit rates of banks also kept rising during the period. Over the year the weighted average lending and deposits rates for all banks increased to 11.60 percent and 6.26 percent respectively at the end of FY06 from 10.93 percent and 5.62 percent respectively in FY05.

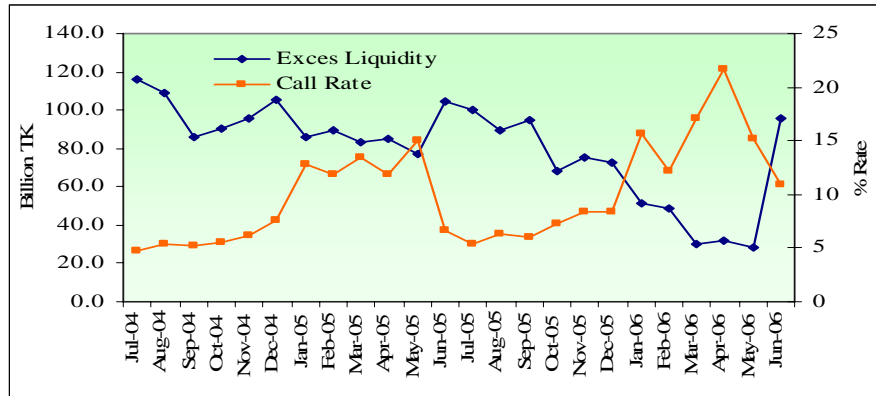
5. Possible Explanation of Money Market Movements

The reasons for this movement in the money market mainly include the following:

- (i) Relatively faster expansion of credit than that of deposits resulting from high credit demand and higher interest rates on the various national savings instruments;
- (ii) Systematic withdrawal of excess liquidity by BB;
- (iii) High seasonal demand for foreign currency resulting from the increased imports bills; and
- (iv) As there is an observed inverse relationship between excess liquidity and call money rates (please see Figure 4), a reduction in excess liquidity in the banking system tends to increase the volatility in the money market. Therefore, managing liquidity condition in the banking system is at the core of stability of the money market. The monetary authority controls the excess liquidity in order to keep it in line with the target monetary base by utilizing the standard instruments such as SLR, CRR, interest rates on government Treasury bills/bonds and other short term interest rates, such as repo/reverse Repo. Generally excess liquidity is affected by the changes in demand for liquid assets by the public and private sectors for different economic purposes. Rise in government and other public sectors borrowing from the banking system as well as unanticipated increase in demand for private sector credit can create extra pressure in the liquidity situation.

⁷ Note that there were no repo operations for 1-2 day during FY06.

Figure 4: Excess Liquidity and Average Call Rate



Source: Research Department and Monetary Policy Department, Bangladesh Bank

6. Underlying relationship between the Foreign Exchange and Money Market:

The preceding analysis of the money and foreign exchange markets delineates that functioning of these markets are interlinked and temporary instability in one market can generate pressure in the other market. This relationship is depicted in Table-4 by a correlation-matrix combining foreign exchange and money market Variables. It is observed that there is high positive correlation between exchange rate and average call rate -estimated coefficient is 0.68 for FY05-06. In the same way, volatility of exchange rate and call money rate are closely associated with each other (correlation coefficient is 0.53 for FY05-06).⁸

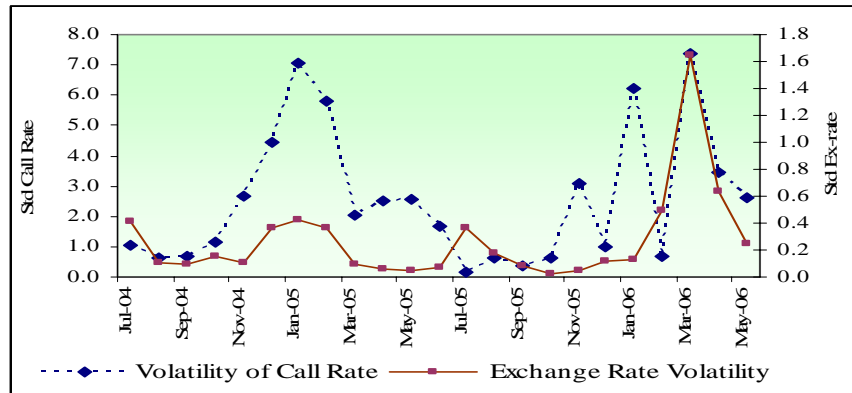
Table 4: Correlation-Matrix of Foreign Exchange and Money Market Variables

	Exchange Rate	Volatility of Exchange Rate	Average Call Rate	Volatility of Call Rate
Exchange Rate	1			
Volatility of Exchange Rate	0.45	1		
Average Call Rate	0.68	0.47	1	
Volatility of Call Rate	0.22	0.53	0.62	1

Figure-5 shows that increasing volatility in the foreign exchange market can transmit into the heightened volatility in the money market and vice versa. In March '06 volatility indicator in both the foreign exchange and money markets reached their highest level and declined subsequently in the following months of FY06. In response, the monetary authority in Bangladesh adopted various policy actions consistent with the tight monetary policy stance and various market conditions contributing significantly in mitigating the pressure on exchange rate of Taka with the improved liquidity in the inter-bank foreign exchange and money markets.

⁸ The data for the correlation analysis comprises of monthly average call money rate and BDT/USD exchange rate along with the estimated standard deviations for both FY05 and FY06.

Figure 5: Volatility in BDT/USD Exchange Rate and Call Money Rate



7. Concluding Remarks

Over the last two fiscal years both the foreign exchange and the money markets in Bangladesh experienced notable volatility, which resulted in substantial depreciation of BDT against major currencies and a temporary rise in the interest rate in the money market. In this paper a modest attempt has been made to explain these developments and the links between these two markets. It is observed that, when the gap between the monthly flow of imports and exports widens or demand for opening import LCs rises (as shares of reserves), the exchange rate tends to depreciate. Similarly, volatility of the exchange rate appears to move in tandem, with the two aforementioned pressures. On the other hand there is high positive correlation between exchange rate and average call money rate and between volatility of exchange rate and that of call money rate, which signal that temporary instability in one market can generate pressure in the other market. These findings are tentative but they deserve careful review in fine tuning the day-to-day management of the policy stance.