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RBI's Balance Sheet and Liquidity Management

We have recently released guides on reading RBI's Weekly Statistical Supplement (WSS) (Part I and II). However, the coverage was mainly from an explanatory angle of the various items in WSS Tables and also covering on the linkages in the tables.

In this report, we take a more detailed look at RBI's balance sheet from a historical perspective. Central bank balance sheets form the foundation of any modern economy as they help create reserve money. It is reserve money which is then used by the various entities for their transactions. Right from a household who purchases items of daily needs to a corporate acquiring any other business entity, the mode of financing is the reserve money. Hence, understanding the evolution and changes in the balance sheet are crucial to understanding the changes in the economy. Infact, along with structural changes in economy, one should be seeing changes in central bank balance sheets as well.

In the second part of the report, we will explore the linkages in the balance sheet with liquidity operations of RBI.

I. RBI's Balance Sheet

RBI's balance sheet is a sum of balance sheets of two major RBI departments:

- Issue department: looks at issuing and management of currency in the system. This is done to maintain the sanctity of the currency issue function. This is in line with practice followed by Bank of England on whose broad model RBI was formed in 1937.
- Banking department: looks at all the other central banking operations like maintenance of CRR balances, loans to government, Open Market Operations etc.

Let us see how the balance sheets have evolved over the years. An important thing to note is that RBI's annual year closes on 30 June of a financial year. However, the annual balance sheet data RBI has given in its Database on Indian Economy is for March ending.

Issue Department balance sheet

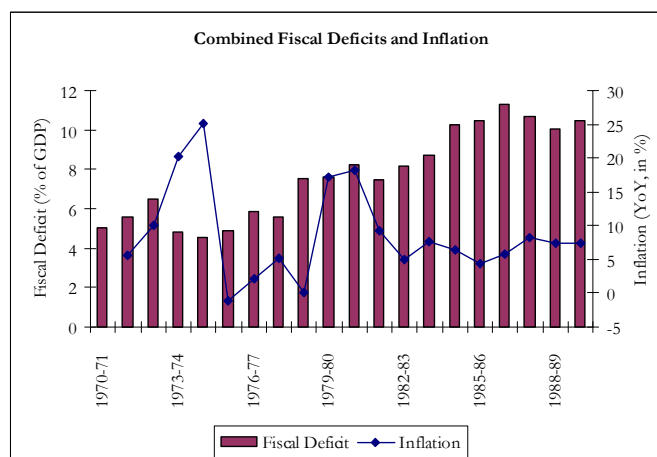
Issue department is responsible for the function which most people associate RBI with – printing and managing currency notes. Its balance sheet is also simpler as currency circulation in the economy forms its liability which is then backed by three main assets – gold, rupee securities and foreign securities. Table 1 shows the changes in composition of the Issue department balance sheet.



	1970s	1980s	1990s	2000s	1970-2011
Notes in Circulation	99.6	99.9	100.0	100.0	99.9
Total Liabilities/Assets	100.0	100.0	100.0	100.0	100.0
Gold Coin and Bullion	2.9	1.1	10.0	5.1	4.8
Foreign Securities	10.6	7.5	13.6	85.0	30.6
GoI Rupee Securities	86.1	91.2	76.3	9.8	64.5

Note: We have excluded Notes in banking system from Liabilities and Rupee Coins from Assets as they constitute a very negligible %age
Source: RBI

- Growth rate of notes in circulation has been rising gradually from 12.3% in 1970s to around 15.5% in 2000s. AS it is the only item in the liability the composition changes do not matter much. In asset items, we see large volatility in both growth rates and composition changes since 1970s.
- In 1970s, around 86% of currency issuance was backed by Government Securities (G-sec). G-sec also grew steadily by around 10.4% in 1970s. Growth in Foreign securities in 1970s is higher at 51.2% but this is mainly during the second-half of 1970s. In first half the forex assets contract each year till 1975-76. Even the share of foreign securities of total assets is a low of 3.9%. It then rises from 1975-76 onwards backed by huge growth rate to show an average share in 1970s at 10.6%. The policy approach then was to restrict foreign investment and hence forex reserves were scarce and precious. The share of gold remains unchanged at 183 Cr between 1970-76 and then rises gradually to touch Rs 225 Cr by 1979-80. Overall, gold's share in total assets averages around 3% in the 1970s.
- In 1980s, we see two main changes. One, the growth rate of G-sec in Issue department assets' rise sharply from 10% in 1970s to 17.6% in 1980s. This leads the share of G-sec to rise from a high of 86% in 1970s to 91% in 1980s. Two, the share of forex reserves decline from 10.6% to 7.5% because of decline in growth rate of forex assets in 1980s. This was mainly because of rise in fiscal deficits and government borrowings being increasingly placed with RBI. The monetization of deficits led to rise in inflation. The rise in fiscal deficits leads to government relying increasingly on the already scarce forex reserves, leading to Balance of Payments (BoP) crisis in 1991.

Figure 1


Note: The high inflation in 1970s is on account of two oil shocks in the decade
Source: RBI



- In 1990s, we see the reverse of the trends seen in 1980s. After the crisis, Indian economy was opened up to foreign competition leading to rise in forex assets. Hence, forex assets as a % of Issue department assets rise to 13.6% from 7.5% in 1980s. the share of G-sec declines to 76.3%. Growth of forex assets rises sharply from Rs 200 Cr in 1993-94 to Rs. 10,200 Cr in 1994-95, showing a jump of 5000%. This one time increase leads to overall growth average in 1980s to come to 520%. By 1999-00, forex assets had risen by seven time to Rs 72,700 Cr. In 1990s, efforts are also made to raise gold bullion assets following the BoP crisis. In 1989-90, gold was around 281 Cr which then rises to 6654 Cr in 1990-91 and is at 10384 Cr in 1999-00. The average growth rate of gold value holdings is 232% (because of the sudden jump in 1990-91) and share in total assets is around 10% (sharply up from 1% share in 1980s).
- In 2000s, we see forex assets rising even sharper with their average share in 2000s about 85%. Infact since 2003-04, the average share of forex assets in total assets is around 94.5%. The share of Rupee securities from 2003-04 has declined to almost nil levels. The rest 6% of total assets comes from gold. This means most of the currency issued in India is backed by forex assets. In gold standard days, each unit of currency was fully backed by gold. In today's times, a person will theoretically get foreign securities worth Rs 0.94 and gold worth Rs 0.06 for every rupee given to RBI.

This change in composition of asset portfolio coincides with implementation of FRBM and change in RBI's monetary policy operating framework to LAF corridor framework. With FRBM, the government stopped placing its bonds directly with RBI (private placement). This led RBI to increasingly rely on forex assets to create currency. The opening of Indian economy and high growth in the same also resulted in sharp rise in foreign inflows leading to generation of forex assets.

But this did not mean that RBI stopped having G-sec on its books. The LAF framework required the RBI to infuse/absorb liquidity in order to keep the call money market rate in the repo/reverse repo corridor. As this was a collateralized activity, the onus of managing G-sec in the books moved to banking department (explained later).

The analysis of balance sheet of the Issue department shows a lot of changes over the years. From a "mainly G-sec asset portfolio" to a "mainly forex securities asset portfolio" side is quite a transformation of the balance sheet. It is even important to note that most of these developments mirror the economic developments. The 1991 crisis is preceded by decline in forex assets and the resurgence of Indian economy shows sharp rise in forex assets. The FRBM Act has further led RBI to keep the G-sec in the portfolio to negligible levels of 1046 cr unchanged since 2005-06.

Banking Department balance sheet

This department is responsible for functions related to banking system like lender of last resort, refinancing, Open Market operations etc. This balance sheet helps one relate to banking developments.

- In banking department, the main liabilities are CRR reserves of Banks (mentioned as deposits of Commercial Banks) and cash balances of government (mentioned as deposits of central government). Unlike issue department where RBI prints currency, in banking department RBI creates reserve money via the Bank reserves. Then there is another item mentioned in the liabilities called as other liabilities which are nothing but non-monetary liabilities of RBI. These are items which do not add to the monetary liabilities of RBI like RBI's capital, reserves and provisions maintained by RBI.
- In assets, the main items are forex assets (mentioned as balances held abroad), investments in government securities (mentioned just as investments), loans and advances to government and



banks. Other assets include gold held in banking department, fixed assets etc.

There are many items under the assets and liabilities in the banking department balance sheet like Deposits with RBI shows Deposits of central government, state government, Commercial Banks, Cooperative Banks, Other Banks etc. Same thing we see in Loans and Advances as well. Hence, we have clubbed the balance sheet into major heads. It is important to note that unlike the issue department where we see consistent trend in the individual items, the growth trends in this department are highly volatile. The main reason is that balance sheet in banking department reports loans & advances and deposits on March ending of the year. These items are not necessarily cumulative barring CRR reserves. So, it could be that government has taken loans from RBI throughout the year but does not show in the balance sheet as they have been repaid by Mar-31. Hence, it is difficult to comment on the growth trends of different items. The focus of the analysis will be on changes in the composition of the balance sheet.

	1970s	1980s	1990s	2000s	1970-2011
Total Deposits	50.8	60.4	60.1	54.7	56.5
Deposits-Central Government	12.3	5.2	0.2	9.0	6.7
Deposits-Commercial Banks	21.2	39.2	51.3	40.4	38.1
Other Liabilities	49.2	39.6	39.9	45.3	43.5
Total Liabilities/Assets	100.0	100.0	100.0	100.0	100.0
Balances held abroad (Forex assets of Banking Department)	18.2	11.5	32.7	65.4	32.8
Loans and Advances	44.9	26.0	18.1	4.8	23.0
Loans to Government	0.0	0.0	0.3	0.5	0.2
Loans to Banks	13.1	5.7	4.8	0.8	6.0
Bills purchased and discounted	12.7	24.3	2.0	0.0	9.5
Investments (G-sec investment of Banking Department including LAF operations from 2000s)	11.6	29.7	40.4	25.5	26.8
Other Assets	8.6	8.4	6.8	4.3	7.0

Source: RBI

- In 1970s, both deposits with RBI and other liabilities form 50% of the total liabilities of the banking department. In asset side, we see loans and advances forming 45% of assets, forex assets as 18% and investments as 12%.
- In 1980s, we see deposits of commercial banks rise to 39%. This is mainly because of a continuous rise in CRR reserve ratio in 1980s from 6% at end of 1970s to 9% by 1984 and 15% by 1988. The investments in government securities also rises sharply from 11.6% of assets to 30% of assets on account of fiscal crisis explained above. The share of G-sec investments in assets rises from 18.7 in 1980-86 to 55.5% in 1987-90.
- In 1990s, we continue to see a rise in share commercial banks deposits to 51% on account of CRR rate remaining around 14-15% between 1990-94. The ratio is gradually eased from 1994 onwards to touch 9% by 1999. Hence, we see decline in deposits of banks from 58% of assets in 1994-95 to about 48% in 1999-00. In assets, we see sharp rise in forex assets from 11.5% to 33% tracking opening of Indian economy as suggested above. The average share of investments remains high at around 60% but this is mainly around the first half as the impact of crisis still lingered. The share starts to decline from 1994-95 onwards to around 25-30% but again rises to 40% levels as fiscal deficit worsened again around that time.
- One very important development in 1997 was the replacement of adhoc Treasury Bills with Ways and Means advances. This stopped the practice of automatic monetisation of government debts. It also gave RBI greater freedom on managing its assets as earlier RBI was involuntarily



saddled with domestic assets in its balance sheet. From hereon, RBI made that very important transition of relying increasingly on foreign assets for creation of reserve money.

- In 2000s, we see banks deposits with RBI declining to around 40% tracking decline in CRR from 9% in 1999 to 4.75% by 2002. CRR again rises in 2007-08 phase to touch 9% as RBI tightened liquidity to fight high inflation levels. So, share of deposits first declines from 48% in 1999-00 to 32.6% in 2004-05 and then rises to 39.9% in 2007-08. In assets, we see a sharp rise in share of investments to 65% tracking India growth story. The share of G-sec declines to 25.5%. G-sec investment also includes net LAF repo operations on 31-Mar ending in 2000s.

The analysis of Banking Department balance sheet is not as simple as issue department. For instance, the way RBI creates reserve money is by increasing bank reserves. Say, RBI does an OMO purchase of Rs 10,000 Cr. It pays to the banking system via increase in deposits/reserves with RBI. But this does not show in the balance sheet as banks could just adjust the increase in bank reserves with their CRR balances. Given these limitations, we still see how the balance sheet of the banking department has evolved over the years. Here also, we see a rise in forex assets as a share of balance sheet as seen in the case of issue department. This shift was possible because of two factors – replacing ad hoc treasury bills with WMA and rise in forex inflows.

Aggregate Balance Sheet:

Let us now compare the aggregate RBI balance sheet with economic parameters. We have tried to analyse it based on two parameters – GDP and inflation. We take GDP as it helps us understand the relation between monetary economy and real economy. We take inflation as monetary conditions determine inflation over a long run. As balance sheet also includes other liabilities which are non-monetary, we also see Reserve Money which is nothing but RBI's balance sheet net of non monetary liabilities of RBI. We did not have data for 2011-2012 in above analysis. However, we were able to approximately compute the size of Issue and Banking department balance sheets for year-ending 2012 from WSS. Hence, tables 3 and 4 shows data till 2011-12.

	1970s	1980s	1990s	2000-12	1970-2012
Banking	28.2	17.5	13.6	18.4	19.2
Issue	12.3	14.8	15.3	15.3	14.5
Total	16.9	16.0	14.3	16.4	15.9
Reserve Money	15.0	16.8	13.9	15.1	15.2
Money Supply	17.6	17.2	17.2	17.0	17.2
GDP	11.5	14.9	14.9	13.6	13.8
Inflation	9.4	8.0	8.1	6.0	7.7

Source: RBI



	1970s	1980s	1990s	2000-12	1970-2012
Banking/GDP	5.4	9.9	9.3	10.6	9
Issue/GDP	8.9	9.2	9.7	11.4	10
Total/GDP	14.3	19.0	19.1	22.0	19
Reserve Money/ GDP	11.9	15.2	15.4	17.2	15
Money Supply/GDP	29.2	42.0	51.3	75.6	50.8
Money Multiplier	2.7	3.0	3.4	4.6	3.5

Source: RBI

The above tables show some interesting trends.

- First, RBI balance sheet as a % of GDP has increased in each decade. It was around 14.3% of GDP in 1970s and has risen to 22% in 2000-12. However as reserve money is a better indicator of growth in monetary liabilities, the overall rise is smaller from 11.9% of GDP in 1970s to 17.2% of GDP in 2000s.
- Within the balance sheet, both issue and banking department balance sheets have risen as % of GDP. A higher rise is seen in the case of banking department balance sheet compared to issue department because of developments in financial markets in 2000s.
- Growth rate in money supply is fairly constant around 17% but there is volatility in reserve money growth in the decades. Money Supply as a % of GDP has risen sharply from 29% of GDP to 76% of GDP in 2000s (it is actually even higher in recent years at around 82% of GDP) because of both rise in reserve money and money multiplier. The reserve money has risen tracking rise in forex reserves and money multiplier has risen because of developments in financial markets.
- The overall impact of monetary liabilities on inflation can be seen but is not as strong as one would imagine. One does see that higher growth in reserve money led to higher inflation in 1980s but since then the relation has kind of weakened. This does not mean that there is no relation between money and inflation. It just means that due to financial innovation and improvements in financial markets, the linkages are not easily measurable. This does not imply that money growth is not useful to assess inflation trends. It just means that one cannot really project inflation based on monetary trends alone.

This is pretty much in line with the history of monetary policy. The main reason why central banks shifted from monetary targeting to managing inflation via interest rates was this loss of predictive power of money supply on inflation. However, most central banks went to the other extreme of not focusing at all on money supply trends. So we had a situation where monetary policy which means relating to money had no role of money! Post- 2008 crisis the importance of monetary indicators particularly credit trends has emerged as a strong indicator to gauge financial stability.

II. Reserve Money and Liquidity

The above exercise helps us understand one very crucial component of monetary operations – liquidity management. If one looks at reserve money, it is nothing but liquidity operations of RBI. When RBI provides reserve money either via currency or bank reserves it is providing liquidity to the banking system which then circulate the money to the overall economy. In a normal cycle, the reserve money creation is smooth as the central bank purchases assets (either domestic government or foreign securities) as per its projections. However when the cycle is disrupted or there is a shock



to the system, the reserve money creation process is also disrupted.

In RBI's case, its reserve money creation has increasingly relied on forex assets over the last few years. The reliance on government securities has declined with Issue department hardly using rupee securities to create currency. This helps RBI maintain stronger independence from government but leads to problems whenever there is a shock to the system as seen in 2008-09 and 2011-12.

In both the years, there was a shock to the system and capital flows reversed and currency depreciated. One can see in the table 5 that between 2005-08, RBI has been creating reserve money mainly via forex assets. In 2008-09 following Lehman shock, the foreign reserves decline. This does not show in Reserve Money table as rupee depreciation leads to higher valuation of the foreign securities in rupee terms.

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Currency in circulation	75.2	71.9	68.0	73.0	72.5	69.0	74.5
Bankers' deposits with RBI	23.6	27.3	31.4	26.5	27.0	30.8	25.4
Other' deposits with RBI	1.2	0.8	0.6	0.5	0.5	0.3	0.2
Reserve Money Components & Sources	100.0	100.0	100.0	100.0	100.0	100.0	100.0
RBI's Claims on Govt.	1.2	-0.4	-19.4	3.5	15.5	28.8	37.7
RBI's Claims on Banks & Commercial sector	1.3	1.3	0.7	2.4	0.4	0.5	0.7
Net forex assets of RBI	117.4	123.4	142.5	134.2	111.2	96.5	102.4
Govt's currency liabilities	1.5	1.1	1.0	1.1	1.0	0.9	1.0
Minus Net non-monetary liabilities of RBI	21.4	25.5	24.8	41.2	28.1	26.7	41.8

Source: RBI

Table 6 shows that though total foreign reserves have declined in USD terms from 310 bn in 2007-08 to 252 bn in 2008-09, it rises in rupee terms from 12.4 lakh Cr to 12.8 lakh crore. Hence, though one may be seeing share of forex assets in reserve money nearly similar to 2008-09, it is not the case of addition of forex reserves. Infact, these gains in forex valuation are shifted to Currency and Gold Revaluation Account in Other Liabilities which rises sharply in 2008-09 from 24.8% to 41.2%. RBI also intervened aggressively to prevent Rupee depreciation selling forex reserves worth USD 35 bn in 2008-09. All this tightened liquidity significantly with LAF Repo borrowing touching Rs 90,000 Cr. Rise in Repo borrowing was followed by OMO purchases and lowering of CRR from 9% to 6%. As a result in components/liabilities side, the share of currency rises but bank reserves decline following CRR cuts.

	Foreign Currency Assets		Total	
	(Rs crore)	(USD Million)	(Rs crore)	(USD Million)
2005-06	647327	145	676387	152
2006-07	836597	192	868222	199
2007-08	1196023	299	1237965	310
2008-09	1230066	241	1283865	252
2009-10	1149650	255	1259665	279
2010-11	1224883	274	1361013	305
2011-12	1330510	260	1506130	294

Source: RBI



We see similar trends in 2011-12 as well. The liquidity tightened significantly based on two reasons. First, the foreign capital inflows slowed down tracking global uncertainty and domestic policy issues. Second, as Rupee depreciated sharply RBI intervened in forex markets. The tight liquidity conditions led RBI to take monetary measures like OMO purchases and easing CRR by 125 bps from 6% to 4.75%. It also took measures like deregulating interest rates on NRE deposits etc. One can see near similar movement in reserve money sources and liabilities as seen in 2008-09. In components, share of bank reserves decline following CRR cuts. In sources, share of RBI's claims against government rises tracking rise in LAF repo borrowing and OMO purchases. The share of forex rises in rupee terms but declines in dollar terms from USD 305 bn in 2010-11 to USD 294 bn in 2011-12. The valuation gains in forex assets are again shifted to other liabilities as its share rises from 26.7% in 2010-11 to 41% in 2011-12.

Let us now see the outlook for 2012-13. RBI has projected Money supply growth for 2012-13 at 15%. Assuming money multiplier at 5.2 (which is the average CRR since CRR cuts in Jan-12), reserve money for the year comes to around Rs 16.2 lakh Cr for 2012-13. This implies a growth of 13% vs. around 4.3% seen in 2011-12. In absolute terms, it implies that in 2012-13, RBI will have to create incremental reserve money worth Rs. 1.87 lakh Cr. How will RBI create this reserve money?

Assuming, there is a status quo and we see similar conditions like last year – forex flows are weak and rupee remains under depreciating pressure. If the forex flows in Rupee terms rises by 10% as seen last year and other liabilities as a % of total reserve money remains at 42% as seen last year, RBI's claims on government needs to rise by around 24% to 6.7 lakh Cr. In absolute terms, this increase stands at Rs 1.30 lakh Cr. This would imply RBI could again be conducting OMOs by around 1 lakh Cr. As RBI's claims on government is already inclusive of LAF Repo, it is expected that LAF repo will continue at similar levels of around Rs 1,00,000 Cr depending on liquidity conditions. LAF repo will address the immediate tightness in liquidity and OMO's will provide a more medium term relief to the markets.

III. RBI's Liquidity Model

RBI publishes a simple liquidity model in its quarterly macroeconomic and monetary developments report released one day before its quarterly Monetary Policy. The table has three main heads.

- First is drivers of liquidity which shows the variables which have led to a systemic deficit or surplus liquidity. This includes variables like RBI's purchase of forex assets (net of valuation; mentioned as RBI's net Purchase from Authorised Dealers), currency with public, Government balances with RBI, Ways and Means Advances (loans to government) and a residual item. These are all autonomous ways of creating liquidity
- Second is management of liquidity which shows RBI's operations to manage the liquidity. This includes LAF operations, OMO purchases, CRR etc. These are discretionary measures used by RBI to ease or tighten liquidity.
- Third is a sum of drivers and management categories which shows whether bank reserves have declined or increased.

Table 7 analyses how each of these three heads have changed over the years. We picked this data from RBI's quarterly Macroeconomic and Monetary Developments Report (MMDR). For 2008-09, data is not completely given and we still do not have a complete picture of 2011-12. One cannot even project the missing data as both government surplus balances and purchase of forex assets net of valuations changes is neither available nor computable. RBI releases government cash balances in its WSS but the government has extra balances over the WSS which are revealed in MMDR. Similarly,



the valuation adjustments of forex reserves is only known to RBI.

The methodology provided by RBI to compute annual data in Table 7 is not really annual changes but sum of quarterly changes in the year. We have mentioned the methodology in the Note at the end of the Table. Based on limitations of data, one should just be using the table to gauge the overall trends.

Table 7: Reserve Bank's Liquidity Management Operations (in Rs Cr)

	2005-06	2006-07	2007-08	2008-09 (Apr-Aug)	2009-10	2010-11	2011-12 (Apr-11 to 25-Nov-11)
A. Drivers of Liquidity (1+2+3+4)	-31719	61739	204026	54804	-101353	-117200	-31380
1. RBI's net Purchase from Authorised Dealers (net of valuation)	68834	118994	312054	-28886	3869	7558	-21160
2. Currency with the Public	-57280	-70352	-84571	-19223	-102043	-146677	-58430
3. a. Centre's surplus balances with RBI	-22726	-1164	-26594	59192	-1962	1765	4710
3. b. WMA and OD	0	0	0	0	0	0	21330
4. Others (residual)	-20547	14260	3137	43720	14657	94	22170
B. Management of Liquidity (5+6+7+8)	57969	-24257	-117743	-89673	132190	175645	8010
5. Liquidity impact of LAF	12080	36435	21165	-42750	495	106995	-7250
6. Liquidity impact of OMO* (net)	10740	720	13510	6344	82355	78413	15260
7. Liquidity impact of MSS	35149	-33912	-105419	-5266	85340	2737	0
8. First round impact of CRR change	0	-27500	-47000	-48000	-36000	-12500	0
C. Bank Reserves # (A+B)	26250	37482	86283	-34869	30837	58445	-23380
<p><i>Note : Annual Data is a sum of Quarterly data provided by RBI. The quarterly data in turn is simply the change in one quarter over the previous quarter data e.g. Suppose, cash balances on last Friday of Q1 2007-08 are 100 Cr and they rise to 5000 Cr on last Friday of Q2 2007-08. RBI reports this as a rise in absorption of liquidity under cash balances in Q2 2007-08 worth Rs. 4900 Cr. The Annual data for 2007-08 is simply sum of the variables in Q1, Q2, Q3 and Q4. For 2011-12, it is a sum of balances between two reported periods - 31-Mar-11 to 21-Oct-11 and 21-Oct-11 to 25-Nov-11. Hence, all data pertains to last Friday for all other quarters.</i></p> <p><i>(+) : Injection of liquidity into the banking system.</i></p> <p><i>(-) : Absorption of liquidity from the banking system.</i></p> <p><i>* : Includes oil bonds but excludes purchases of government securities on behalf of State Governments.</i></p> <p><i># : Includes vault cash with banks and adjusted for first round liquidity impact due to CRR change.</i></p>							
Source: RBI							

Table 7 reaffirms what we have analysed above. Before 2008-09, the major driver of liquidity is rising foreign assets. In 2006-08, RBI is actually absorbing liquidity (as seen in management of liquidity) in backdrop of liquidity market being in large surpluses leading to inflationary pressures. Though, Government cash balances are absorbing liquidity, the larger forex inflows keep overall liquidity in surplus. RBI tightened liquidity in this period via issuing of MSS bonds and increasing CRR. Despite surplus liquidity, banks are borrowing from RBI on the Repo window leading to overall rise in bank reserves.

In 2008-09, the situation reverses with decline in forex reserves leading to problems in reserve money creation. Though, cash balances reverse injecting liquidity in the system. As we only have data for first half of 2008-09 one does not get the complete picture. The forex reserves declined sharply in second half leading to lower CRR, rise in OMO and desequating of MSS balances.

In 2009-11, we see forex assets again becoming positive but much lower than what we saw in 2006-



08 period. As a result, we see RBI managing liquidity via LAF repo, OMO and desequelting of MSS. RBI raises its CRR ratio exiting from the easy monetary policies taken in 2008-09, thereby absorbing liquidity. Overall, we see bank reserves rise in this period.

The situation again reverses in 2011-12 and we see similar trends as seen in 2008-09. Forex reserves decline on account of both outflow and intervention in forex markets by RBI. This leads to lower reserve money creation. The government cash balances provide some relief but not as much as seen in 2008-09. Moreover, there is rise in WMA in this period leading to further tightening of liquidity. RBI manages liquidity by LAF repo and OMO purchases. There is no MSS balance this time. As RBI has released data till 25-Nov-11, it does not show CRR cuts which started in Jan-12 and OMO purchases worth Rs 1,13,000 Cr. The net change in the period Apr-11 to 25-Nov-11 is a decline in bank reserves worth 23,880 Cr indicating tight liquidity conditions.

III. Conclusion

The above analysis is an extension of our previous analyses on RBI's Weekly Statistical Supplement. The analysis shows how RBI's balance sheet has evolved over the years and the changes within it. It is interesting to note how changes in the balance sheet mirror the changes in the economy. In 2000s, RBI has increasingly relied on forex assets to create reserve money. which served the purpose well till the Lehman crisis when share of rupee securities increased in the balance sheet. As economy recovered quickly post-crisis, forex assets again started rising and situation seemed to have returned to normal. The strategy was again tested in second half of 2011-12 when forex flows slowed and rupee depreciated sharply.

With things expected to remain the same in 2012-13, it is again expected to prove a challenging year for RBI as far as liquidity management is concerned. If situation on external front does not improve much, it is again expected to rely on government securities for liquidity creation. RBI should also be looking at its recent strategy of relying extensively on forex assets for creating reserve money/liquidity. Though, if RBI shifts its portfolio towards higher government securities it will lead to markets criticizing the RBI for monetizing the Central Government deficit. The various combinations have put RBI into a complicated position on liquidity management.



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