

Coping With Liquidity Management in India: A Practitioner's View

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"Liquidity Management in India" is a subject that is not widely discussed but is the bread and butter of daily monetary management. Whereas I was not a monetary specialist prior to coming to the Reserve Bank, I have been able to gather some insights through on-the-job training. It is also an issue of current relevance and appeal.

Conduct of monetary policy and management in the context of large and volatile capital flows has proved to be difficult for many countries. As India became convertible on the current account, and liberalised its capital account in a carefully sequenced manner since the balance of payment crisis of 1991, it too has been faced with similar problems. The evolving policy mix involved careful calibration that took into account diverse objectives of central banking, changes in the monetary policy framework and operating procedures, and widening of the set of instruments for liquidity management.

Before opening of the economy through the 1990s, both the current and capital accounts were controlled. However, despite trade restrictions the current account was in constant deficit, which had to be financed mostly by debt, both official aid flows and private debt. Portfolio flows were not permitted and foreign direct investment was negligible. The only largely "uncontrolled" flows were NRI deposits, which waxed and waned according to macro-economic conditions. The exchange rate was also controlled: it was linked to a basket of currencies and moved as a crawling peg. Consequently, monetary policy management, such as it was, did not pose serious problems, particularly since most interest rates were fixed administratively.

It is only after substantial opening of the economy, and deregulation of interest rates that price discovery of the rate of interest has become important. Consequently the Reserve Bank has had to experiment on a continuous basis. It has had to operate simultaneously on the external account in the foreign exchange market to contain volatility in the exchange rate, and in the domestic market to contain volatility in interest rates. Since both the exchange rate and interest rate are the key prices reflecting the cost of money, it is particularly important for the efficient functioning of the economy that they be market determined and be easily observed. Excessive fluctuation and volatility masks the underlying value and gives rise to confusing signals. The task of liquidity management then is to provide a framework for the facilitation of forex and money market transactions that result in price discovery sans excessive volatility.

* Based on the addresses of Deputy Governor, Reserve Bank of India at 36th Gujarat Economic Association at N. S. Arts College, Anand on January 28, 2006 and at the 8th Annual Conference on Money and Finance in the Indian Economy at Indira Gandhi Institute of Development Research (IGIDR), March 27, 2006. The author is indebted to Chandan Sinha, Mridul Saggar and Partha Ray for their assistance in preparing the paper.

Liquidity Management and Management of Capital Flows

Let me begin with some general remarks on liquidity management and management of capital flows.

While in the macroeconomic context, liquidity management refers to overall monetary conditions, reflecting the extent of mismatch between demand and supply of overall monetary resources, for a central bank, the concept of liquidity management typically refers to the framework and set of instruments that the central bank follows in steering the amount of *bank reserves* in order to control its price, consistent with the ultimate goals of monetary policy (Bindseil, 2000). What is the price of bank reserves? The price of bank reserves is fixed in terms of short term interest rates. This is set in terms of overnight inter-bank borrowing and lending rates either secured or unsecured which affect the reserves that the banks keep. As markets do not clear often on their own the central bank itself steps in by influencing the short-term interest rates by affecting short-term repurchase obligations with banks (Borio, 1997).

The need for liquidity management arises from central banks' concept of liquidity measured in terms of the monetary base, of which it is the monopoly supplier. The supply of monetary base by the central bank depends on (i) the public's demand for currency, as determined by the size of monetary transactions and the opportunity cost of holding money and, (ii) the banking system's need for reserves to settle or discharge payment obligations. In fulfilling these needs, central banks also attempt to control and modulate liquidity conditions by varying the supply of bank reserves to meet its macroeconomic objectives subject to the constraint of financial stability. Bank reserves are, therefore, influenced through reserve requirements or open market operations. In so doing, central banks attempt to affect the level of short-term interest rates in a manner in which market movements of these interest rate movements are smoothed out as volatility of any monetary or non-monetary asset prices can be costly in terms of real output and investment decisions. It is from this standpoint that a central bank decides to modulate its market operations over a chosen time horizon to reflect its policy stance.

The importance of central bank liquidity management lies in its ability to exercise considerable influence and control over short-term interest rates by small money market operations. This ability is determined by the credibility of the central bank itself. The interventions that the central bank makes have a pronounced signaling affect. Consequently, developed country central banks typically aim at a target overnight interest rate, which acts as a powerful economy wide signal. As a result, the impact of these transactions is fundamentally different from those undertaken by private market participants. The liquidity management function of a central bank involves a larger economy-wide perspective. Central bank liquidity management has short-term effects in financial markets. However, the long-term implications for the real sector and on price level are more important.

By operating on the current account balances that the commercial banks maintain with the central bank or by directly operating on the short-term money market rate, central

banks attempt to influence money market liquidity in order to exercise control over the short-term interest rate. The central bank may directly set at least one of the short-term interest rates that acts as its policy rate. By controlling the short-term interest rate while letting markets determine the rest of the yield curve, the central bank attempts to transmit monetary policy impulses across the yield curve. The sovereign yield curve in turn influences the lending and deposit rates in the economy. Mortgage rates are found to be particularly sensitive to the policy rate changes through the interest rate as well as the credit channel. Once bank lending gets affected, interest rates impact real variables such as consumption and investment, which in turn impact output and inflation levels. So while active liquidity management has a localised objective of keeping short-term interest rates range bound, it also has a long-term meta objective of implementing monetary policy goals of inflation and output.

The difficulty is that monetary policy is formulated and implemented under considerable uncertainty. Injections or absorptions made over extended periods as an intended part of policy have implications on output and prices through changes in interest rates and aggregate demand. Typically, the transmission effects tend to differ across countries depending on country specific factors and institutional and regulatory frameworks. As transmission occurs with long and variable lags in all countries, the long-run impact is often unpredictable.

While liquidity management in most advanced country central banks is conducted in a setting where daily demand for money typically exceeds its supply, liquidity management in emerging markets is more varied, with surplus and shortage conditions alternating and with perhaps greater fluctuations in their external accounts (Saggar, 2006). In recent years, capital flows have been a major factor affecting liquidity management in a large number of countries, particularly in Asia, which have faced large and volatile capital flows. Capital flows have little effect on liquidity in the presence of equivalent current account deficits that result in the absorption of capital flows in the economy and they help to accelerate growth in investment, employment and in technology imports, contributing to productivity growth. In situations where they exceed the current account deficit, they result in a build up of foreign exchange reserves, which themselves act as a positive signaling device indicating financial stability.

But unsterilised capital inflows can result in inflation, currency appreciation, loss of competitiveness and attenuation of monetary control. The loss of monetary control could be steep if such flows are large. Even when these flows are sterilised through open market operations the costs could be large when sterilisation operations raise domestic interest rates and result in the trap of even greater capital flows. The fiscal impact of sterilisation also requires to be factored in, specially when a large stock of securities is required to be issued for the purpose.

Clearly, macroeconomic policy options for managing capital flows are difficult. The options also require taking into account the high volatility often associated with such capital flows. These flows are marked by sudden surges and reversals, which in some cases, could occur in a week's time or less. In other cases, surges could be followed by

stoppages in a short span of time. Stoppages could also give way to reversals at slight triggers. There are also cases where capital flows are sustained over a long period of time or a drought in flows occurs over a medium-term. In sum, these flows are somewhat unpredictable and it is very difficult to assess the liquidity scenario even over a quarter, far less over a year. At the same time, monetary policy operates with transmission lags that could run 3-4 quarters or longer and these lags are often unpredictable.

Typically, countries that are in the quest for capital flows fall under the impossible trinity problem, referred to earlier. Notwithstanding the theoretical basis, history is replete with examples of countries falling under the temptation to achieve all these goals when faced with opportunities for benefiting from global asset portfolio allocations (Obstfeld, Shambaugh, and Taylor, 2004). Generally, countries seek to retain their monetary policy independence as they face asymmetric shocks and common currency area conditions are not pervasive. They are also tempted to keep their exchange rates stable for financial stability or for inflation containment objectives. In most cases countries end up making a costly exit from a hard peg. With greater financial openness, many countries have to move towards greater exchange rate flexibility or accept the subordination of monetary policy goals to goals of global capital market integration. The latter, however, could be costly.

Let me now turn to our own situation and how we have coped with the evolving circumstances in India.

Capital Flows in India

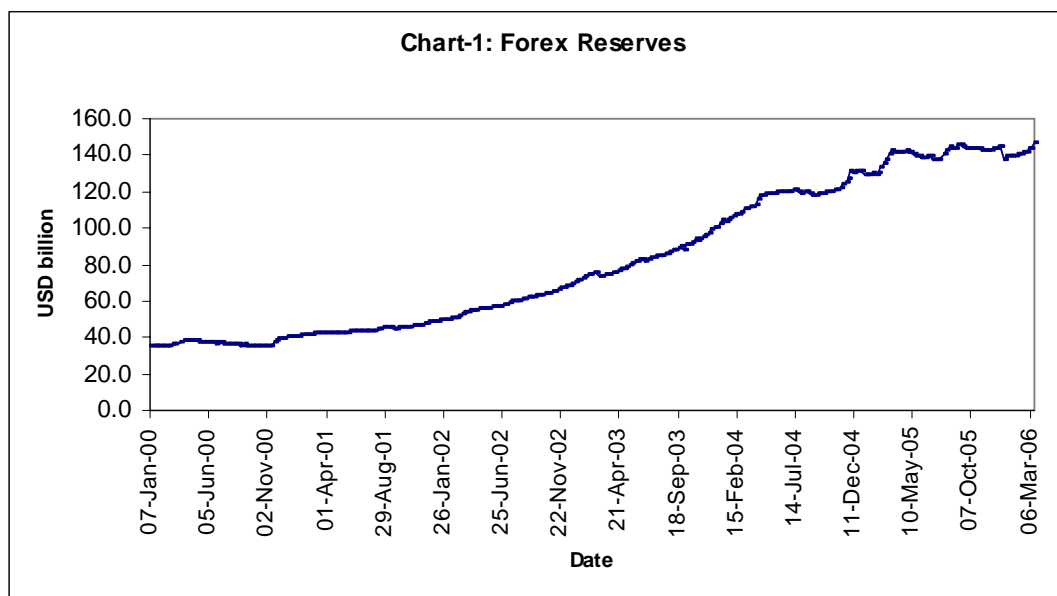
The far reaching economic reforms in India in the 1990s, witnessed a sharp increase in capital inflows as a result of capital account liberalisation in India and a gradual decrease in home bias in asset allocation in advanced economies. During 1990-91, it was clear that the country was heading for a balance of payment crisis caused by increased absorption due to deficit financed fiscal expansion of the 1980s and the trigger of oil price spike caused by the Gulf War. As foreign exchange reserves dwindled to less than a month's import financing requirements in 1991, global capital taps got switched off and the country faced a real possibility of a first ever sovereign default. Crisis managers got active and averted the default, leaving the country still with a default-free history. The survival stimuli it kindled, unleashed massive economic reforms. The reform story has been told several times in many different fora and I do not intend to repeat it here.

Foreign investment flows, mainly in the form of foreign direct investments, averaged US\$118 billion during 1990-91 and 1991-92. A significant change in our capital account took place when portfolio investments by foreign institutional investors were permitted in 1992. With the exception of 1998-99 when, in the aftermath of contagion from East Asian financial crisis, portfolio flows turned negative, total foreign investment in the form of direct and portfolio investment was US\$ 4-8 billion a year till 2002-03. Excluding 1998-99, it has averaged nearly US\$ 5.8 billion over a 9-year period starting 1993-94. There was another quantum leap in the following two years – 2003-04 and

2004-05 with direct investment averaging US\$ 5.1 billion and portfolio investment averaging US\$ 10.1 billion, taking total foreign investment exceeding US\$ 15 billion. As it happened, this increase in capital flows coincided with a slowdown in the economy, particularly the industrial economy after 1997-98, and instead of current account deficits we had current account surpluses. Consequently, even ignoring the non-resident deposit flows, equity investment flows in themselves posed a considerable challenge for monetary management.

While the year to year foreign investment flows provide some idea of the magnitude of the capital flows that may be required to be sterilised, the month-to-month or intra-month variations in these flows provide a better idea of the volatility of these flows with which central bank liquidity management has to cope and these variations have been sizeable. They have been dominated by portfolio flows. While these flows appeared to be mean reverting till October 2002, there appears to have been a strong trend with wider oscillations subsequently. This means that the monetary authorities now have to cope with larger and more volatile capital flows than it had been faced with in about a decade from the onset of reforms.

Faced with these large capital flows, there has been a steep accretion to foreign exchange reserves starting October 2000. Over US\$ 100 billion have been added in foreign exchange reserves since then, taking them from US\$ 34.9 billion to US\$ 143.6 billion in October 2005. IMD redemptions saw the reserves temporarily dropping to US\$ 135 billion at end-December 2005 but the reserves are back at US\$ 146.2 billion by March 17, 2006 (Chart 1). The reserve accretion of this large magnitude has been largely the result of massive capital flows. The capital flows are adding to absorption directly as well as indirectly through increased domestic credit growth and have resulted in a steep rise in trade deficit and, till at least recently, substantial excess liquidity in the economy. The problem of scarcity of 1991 is now seen as a problem of plenty by many.



In these circumstances, the problem for monetary management was two-fold. First, it had to distinguish implicitly between durable flows and transient flows. If capital flows are deemed to be durable and indefinite, questions arise regarding foreign exchange management. If the flows are deemed to be semi-durable, essentially reflecting the business cycle, the task of monetary and liquidity management is to smoothen out their impact on the domestic economy, finding means to absorb liquidity in times of surplus and to inject it in times of deficit. Second, in the short term, daily, weekly or monthly volatility in flows needs to be smoothened to minimise the effect on domestic overnight interest rates. In practice, *ex-ante*, it is difficult to distinguish what is durable, what is semi-durable and what is transient. Hence policy and practice effectively operates in an environment of uncertainty and a variety of instruments have to be used to manage liquidity in this fluid scenario.

Shift from Direct to Indirect Instruments

There has been a worldwide trend for shifting from direct instruments of monetary control to indirect instruments (Alexander, Balino and Enoch, 1995). India is one of the emerging market countries, where such a change has distinctly occurred. A major transformation has occurred in the monetary policy framework in the 1990s. In response to the changing financial landscape, the Reserve Bank adopted several policy changes which transformed the monetary policy framework.

Monetary policy had to respond to the challenge posed by the problem of plenty, which required liquidity management to be honed up to meet the new challenge. Major institutional changes since 1991 have supported the possibility of transition in the monetary policy framework. Credit ceilings were removed, though directed lending was retained. Interest rates were freed with the exception of the saving deposit rate, some NRI deposit rates and lending rates for loans of below Rs 2 lakh. From a completely managed float, the exchange rate was made market determined and the rupee was made fully convertible on the current account, while the capital account was substantially liberalised. Automatic monetisation of budget deficits was stopped with the signing of the Supplemental Accord in 1997. Yields on gilts were made market determined, while the pricing of primary stock market issues were freed. With financial innovations, money demand was seen to be less stable than before and disequilibrium in money markets had begun to be reflected in short-term interest rates. The exchange rate had become endogenous to money, income, prices and interest rates. There is increasing evidence of increased integration among various financial markets. The money market has integrated substantially with the foreign exchange market at the short-end. Furthermore, foreign exchange market efficiency was found to hold at the short-end. The term structure was still somewhat segmented but some transmission across the yield curve was in evidence.

In response to the changing financial landscape, the Reserve Bank adopted several policy changes that transformed the monetary policy framework. Reserve requirements in the form of Cash Reserve Ratio (CRR) were brought down from the

statutory maximum of 15 per cent of net demand and time liabilities during July 1989 to April 1993 to 4.5 per cent in June 2003, which was raised subsequently to 5.0 per cent in two stages in October 2004. The Statutory Liquidity Ratio (SLR), which directs banks to maintain liquid investments, mainly in the form of government securities, was reduced from an all time high of 38.5 per cent in January 1993 to the statutory minimum of 25 per cent by October 1997. Legislation has now been introduced in Parliament to remove both the statutory minimum for SLR and CRR in order to provide for greater monetary policy flexibility.

From the point of monetary policy framework, the significant development was the move to a "multiple indicator approach" from 1998. Prior to the mid-1980s, monetary policy was based predominantly on direct instruments of monetary control with credit budgets for the banks being framed in sync with monetary budgeting. In view of the institutional changes stated in this section and the subsequent one, the Reserve Bank formally shifted its policy framework from monetary targeting to the multiple indicator approach since 1998-99. As part of this approach, it started using the information content in interest rates and rates of return in different markets along with currency, credit, fiscal position, trade, capital flows, inflation rate, exchange rate, refinancing and transactions in foreign exchange, juxtaposing it with output data for drawing policy perspectives.

Liquidity Management through Indirect Instruments: Early Trends

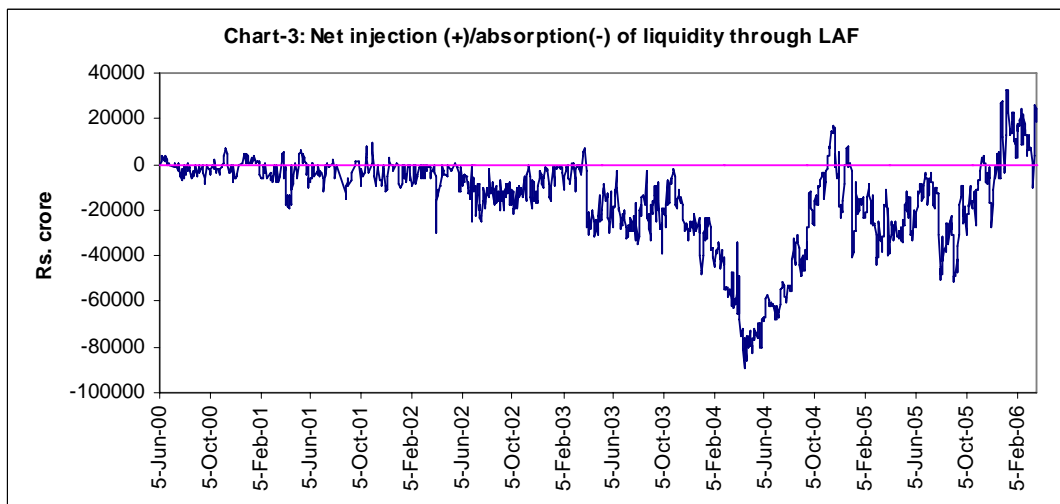
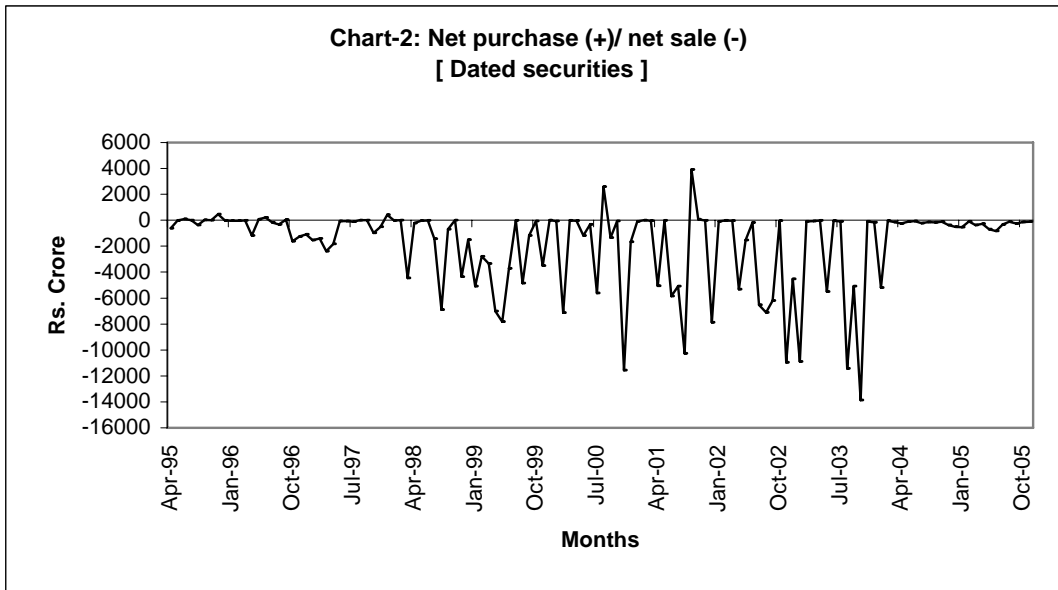
Before the advent of repos, market operations by the RBI almost invariably focused on open market operations through outright transactions in government securities. The scope of open market operations in the earlier period was limited as yields were repressed by an administered interest rate regime, including auctions of T-bills on tap at fixed coupon of 4.6 per cent. The move towards a market determined system of interest rates began by development of the secondary market by increasing coupons and decreasing maturity of government debt¹. The yields were made substantially market determined by introduction of auctions since the mid-1980s². The Reserve Bank introduced reverse repos for absorption from December 1992³. With the objective of improving short-term management of liquidity in the system and to smoothen out interest rates in the call/notice money market, the Reserve Bank began absorbing excess liquidity through auctions of reverse repos (then called repos). The development of repos into a full fledged monetary instrument in the form of LAF has been a fascinating case study of what it takes to undertake changes in operating framework. The chronology of these developments is provided in Box-I. Till 2003-04, market operations were primarily

¹ During 1985-86 to 1997-98, the maximum coupon rate was increased from 6.5 per cent to 11.5 per cent. The maximum maturity was brought down from 30 to 20 years.

² T-bills auctions introduced included 182-days T-bills in November 1986, 364-days T-bills in April 1992 and 91-days T-bills in January 1993.

³ The nomenclature used at that time was repos for absorption and reverse repos for injections. Internationally, as a matter of practice, central banks generally use the term 'repo' for liquidity injections. Repo is defined as an instrument to borrow funds. The central banks choose to use the term from the market's point of view. RBI adopted this usage effective October 29, 2004 and the terms repo and reverse repo in this paper are used consistently as per this new definition.

conducted in the form of outright sales and purchases of government securities (Chart-2). Since then, LAF volumes have increased considerable (Chart-3). The important contribution of LAF has been in keeping overnight interest rates by and large range bound. With the activation of bank rate as a policy instrument, reverse repos helped in creating an informal corridor in the money market, with the reverse repo rate as floor and the Bank Rate as the ceiling. The use of these two instruments enabled RBI to keep the call rate by and large within this informal corridor.



Although repo auctions were conducted at variable rates when LAF was introduced, with a view to providing quick interest rate signals, RBI did have the additional option to switch over to fixed rate repos on overnight basis, in order to meet unexpected domestic or external developments. LAF was introduced on the basis of uniform price auctions, but the auction system was switched to multiple price auctions from May 5, 2001 (Box - I).

Box-I: Liquidity Adjustment Facility

The choice of operating framework and operating procedures in any economy is always a difficult one and depends on the stage of macro-economic and financial sector development and is somewhat of an evolutionary process. As part of the financial sector reforms launched in mid-1991, India began to move away from direct instruments of monetary control to indirect ones. The transition of this kind involves considerable efforts to develop markets, institutions and practices. In order to facilitate such transition, India developed a Liquidity Adjustment Facility (LAF) in phases considering country-specific features of the Indian financial system. LAF is based on repo / reverse repo operations by the central bank.

In 1998 the Committee on Banking Sector Reforms (Narasimham Committee II) recommended the introduction of a Liquidity Adjustment Facility (LAF) under which the Reserve Bank would conduct auctions periodically, if not necessarily daily. The Reserve Bank could reset its Repo and Reverse Repo rates which would in a sense provide a reasonable corridor for the call money market. In pursuance of these recommendations, a major change in the operating procedure became possible in April 1999 through the introduction of an Interim Liquidity Adjustment Facility (ILAF) under which repos and reverse repos were formalised. With the introduction of ILAF, the general refinance facility was withdrawn and replaced by a collateralised lending facility (CLF) up to 0.25 per cent of the fortnightly average outstanding of aggregate deposits in 1997-98 for two weeks at the Bank Rate. Additional collateralised lending facility (ACLF) for an equivalent amount of CLF was made available at the Bank Rate plus 2 per cent. CLF and ACLF availed for periods beyond two weeks were subjected to a penal rate of 2 per cent for an additional two week period. Export Credit refinance for scheduled commercial banks was retained and continued to be provided at the bank rate. Liquidity support to PDs against collateral of government securities at the bank rate was also provided for. ILAF was expected to promote stability of money market and ensure that the interest rates move within a reasonable range.

The transition from ILAF to a full-fledged LAF began in June 2000 and was undertaken in three stages. In the first stage, beginning June 5, 2000, LAF was formally introduced and the Additional CLF and level II support to PDs was replaced by variable rate repo auctions with same day settlement. In the second stage, beginning May 2001 CLF and level I liquidity support for banks and PDs was also replaced by variable rate repo auctions. Some minimum liquidity support to PDs was continued but at interest rate linked to variable rate in the daily repos auctions as determined by RBI from time to time. In April 2003, the multiplicity of rates at which liquidity was being absorbed/injected under back-stop facility was rationalised and the back-stop interest rate was fixed at the reverse repo cut-off rate at the regular LAF auctions on that day. In case of no reverse repo in the LAF auctions, back-stop rate was fixed at 2.0 percentage point above the repo cut-off rate. It was also announced that on days when no repo/reverse repo bids are received/accepted, back-stop rate would be decided by the Reserve Bank on an *ad-hoc* basis. A revised LAF scheme was operationalised effective March 29, 2004 under which the reverse repo rate was reduced to 6.0 per cent and aligned with bank rate. Normal facility and backstop facility was merged into a single facility and made available at a single rate. The third stage of full-fledged LAF had begun with the full computerisation of Public Debt Office (PDO) and introduction of RTGS marked a big step forward in this phase. Repo operations today are mainly through electronic transfers. Fixed rate auctions have been reintroduced since April 2004. The possibility of operating LAF at different times of the same day is now close to getting materialised. In that sense we have very nearly completed the transition to operating a full-fledged LAF.

With the introduction of Second LAF (SLAF) from November 28, 2005 market participants now have a second window to fine-tune the management of liquidity. In past, LAF operations were conducted in the forenoon between 9.30 a.m. and 10.30 a.m. SLAF is conducted by receiving bids between 3.00 p.m. and 3.45 p.m. The salient features of SLAF are the same as those of LAF and the settlement for both is conducted separately and on gross basis.

The introduction of LAF has been a process and the Indian experience shows that phased rather than a big bang approach is required for reforms in the financial sector and in monetary management.

References:

RBI (1999), *Repurchase Agreements (Repos): Report of the Sub-group of the Technical Advisory Committee on Government Securities Market*, April, 1999, Mumbai: Reserve Bank of India.

RBI (2003), *Report of the Internal Group on Liquidity Adjustment Facility*, December 2003, Mumbai: Reserve Bank of India.

The introduction of LAF had several advantages.

- First and foremost, it helped the transition from direct instruments of monetary control to indirect and, in the process, certain dead weight loss for the system was saved.
- Second, it has provided monetary authorities with greater flexibility in determining both the quantum of adjustment as well as the rates by responding to the needs of the system on a daily basis.
- Third, it enabled the Reserve Bank to modulate the supply of funds on a daily basis to meet day-to-day liquidity mismatches.
- Fourth, it enabled the central bank to affect demand for funds through policy rate changes.
- Fifth and most important, it helped stabilise short-term money market rates.

The call rate has been largely within a corridor set by the repo and reverse repo rates, imparting greater stability in the financial markets. As has been mentioned, the emergence of corridor was gradual. The transition is not a menu choice as is sometimes viewed in text books.

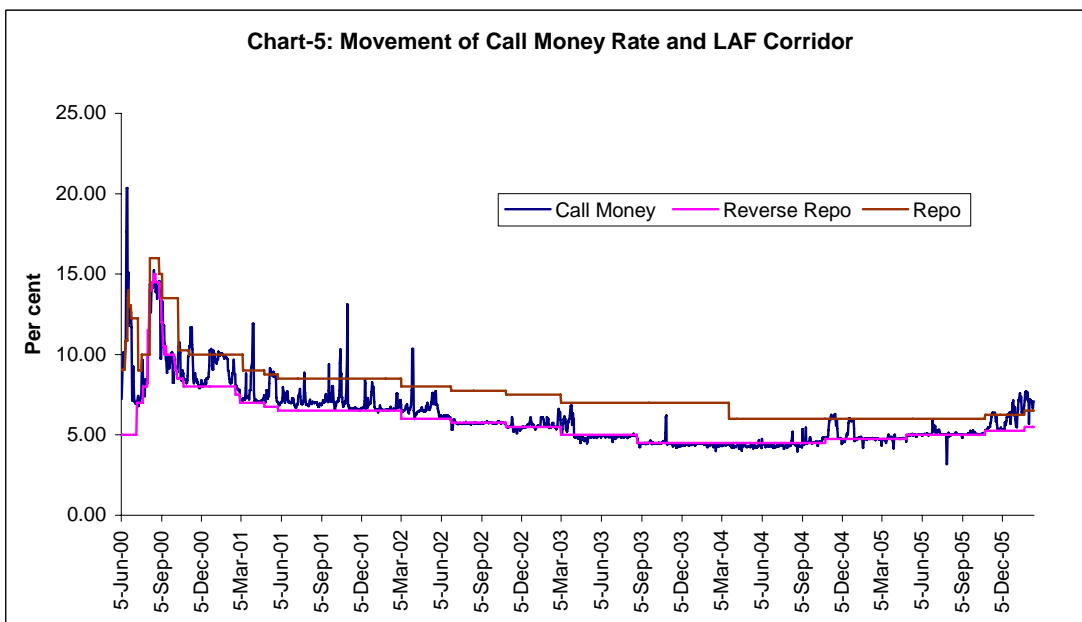
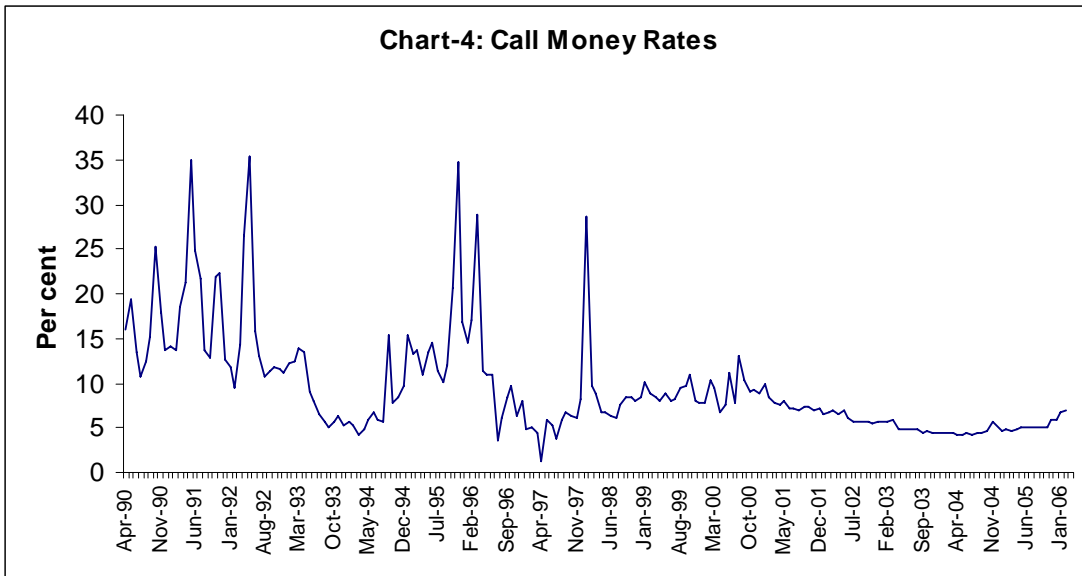
LAF has now emerged as the principal operating instrument of monetary policy. Although there is no formal targeting of overnight interest rates, the LAF is designed to nudge overnight interest rates within a specified corridor, the difference between the fixed repo and reverse repo rates, currently 100 basic points. The LAF has enabled the Reserve Bank to de-emphasise targeting of bank reserves and focus increasingly on interest rates. This has helped in reducing the CRR without loss of monetary control.

Liquidity Management in the More Recent Period

Let me now focus on our experience in liquidity management in recent years. After the introduction of the second stage of LAF in May 2001, liquidity has generally been in surplus mode with the increase in levels of capital flows and in the presence of a current account surplus until 2003-04. With the continuing accretion to foreign exchange reserves, there was corresponding injection of liquidity that had to be sterilised. At the same time, the reverse repo policy interest rate was reduced in successive steps from 6 per cent in March 2002 to 4.5 per cent by August 2003 before raising it to 5.50 per cent by January 2006 in four increases of 25 basis points each. Thus, the aim of monetary policy was to keep overnight call money market rates in the system within the informal interest rate corridor.

On the whole, LAF has had a pronounced favourable impact of lowering volatility of short-term money market rates. Monthly average call rates, which were volatile in a 5-35 per cent band during 1990-98, have clearly stabilised subsequently and have generally ranged between 5-10 percent (Chart 4). Call rates have become largely bounded by the informal interest rate corridor after the introduction of LAF (Chart 5). The

corridor between repo and reverse repo rates which was set at 200 basis points initially and was widened to 250 basis points in August 2003 was lowered to 150 basis points in March 2004, to 125 basis points in October 2004 and further to 100 basis points in April 2005. The call rates have remained anchored around the lower corridor since June 2002, except for a brief period during February-April 2003 and between October 2004 and January 2005. Again since October 2005, the system appears to have clearly moved from enduring surplus to marginal deficits.



Monetary management since mid-2002 has clearly focused on managing surplus liquidity. This was accomplished by the simultaneous operation of the LAF and open market operations.

Given that RBI had a finite stock of government securities its ability to mop up large capital inflows indefinitely was therefore limited, and LAF operations began to bear the burden of stabilisation disproportionately. Moreover, the LAF is essentially designed to take care of fictional liquidity on a day-to-day basis, hence its function was itself beginning to get distorted by such a sterilisation.

Box-II: Market Stabilisation Scheme (MSS)

The money markets operated in liquidity surplus mode since 2002 due to large capital inflows and current account surplus. The initial burden of sterilisation was borne by the outright transaction of dated securities and T-bills. However, due to the depletion in stock of government securities, the burden of liquidity adjustment shifted on LAF, which is essentially a tool of adjusting for marginal liquidity. Keeping in view the objective of absorbing the liquidity of enduring nature using instruments other than LAF, the Reserve Bank appointed a Working Group on Instruments of Sterilisation (Chairperson: Smt Usha Thorat). The Group recommended issue of T-bills and dated securities under Market Stabilisation Scheme (MSS) where the proceeds of MSS were to be held by the Government in a separate identifiable cash account maintained and operated by RBI. The amounts credited into the MSS Account would be appropriated only for the purpose of redemption and / or buy back of the Treasury Bills and / or dated securities issued under the MSS. In pursuance of the recommendation the Government of India and RBI signed a Memorandum of Understanding (MoU) on March 25, 2004. As part of the MoU, the scheme was made operational since April 2004. It was agreed that the Government would issue Treasury Bills and/or dated securities under the MSS in addition to the normal borrowing requirements, for absorbing liquidity from the system. These securities would be issued by way of auctions by the Reserve Bank and the instruments would have all the attributes of existing T-bills and dated securities. They were to be serviced like any other marketable government securities. MSS securities are being treated as eligible securities for Statutory Liquidity Ratio (SLR), repo and Liquidity Adjustment Facility (LAF).

The payments for interest and discount on MSS securities are not made from the MSS Account. The receipts due to premium and/or accrued interest are also not credited to the MSS Account. Such receipts and payments towards interest, premium and discount are shown in the budget and other related documents as distinct components under separate sub-heads. The T-bills and dated securities issued for the purpose of the MSS are matched by an equivalent cash balance held by the Government with the Reserve Bank. Thus, they only have a marginal impact on revenue and fiscal balances of the Government to the extent of interest payment on the outstanding under the MSS.

For mopping up enduring surplus liquidity, policy choice exist between central bank issuing its own securities or government issuing additional securities. A large number of countries, such as, Chile, China, Colombia, Indonesia, Korea, Malaysia, Peru, Philippines, Russia, Sri Lanka, Tawian and Thailand have issued central bank securities. However, central banks of many of these countries faced deterioration in their balance sheets. As such, there are merits in issuing sterilisation bonds on government account. This is more so, in case of an already well established government debt market, where issuing of new central bank bills of overlapping maturity could cause considerable confusion and possible market segmentation which could obfuscate the yield curve, reduce liquidity of the instruments and make operations that much more difficult.

MSS has considerably strengthened the Reserve Bank's ability to conduct exchange rate and monetary management operations. It has allowed absorption of surplus liquidity by instruments of short term (91-day, 182-day and 364-day T-bills) and the medium-term (dated Government securities) maturity. Generally, the preference has been for the short-term instruments. This has given the monetary authorities a greater degree of freedom in liquidity management during transitions in liquidity situation.

Reference:

RBI (2003), *Report of the Working Group on Instruments of Sterilisation*, Mumbai: Reserve Bank of India, December 2003.

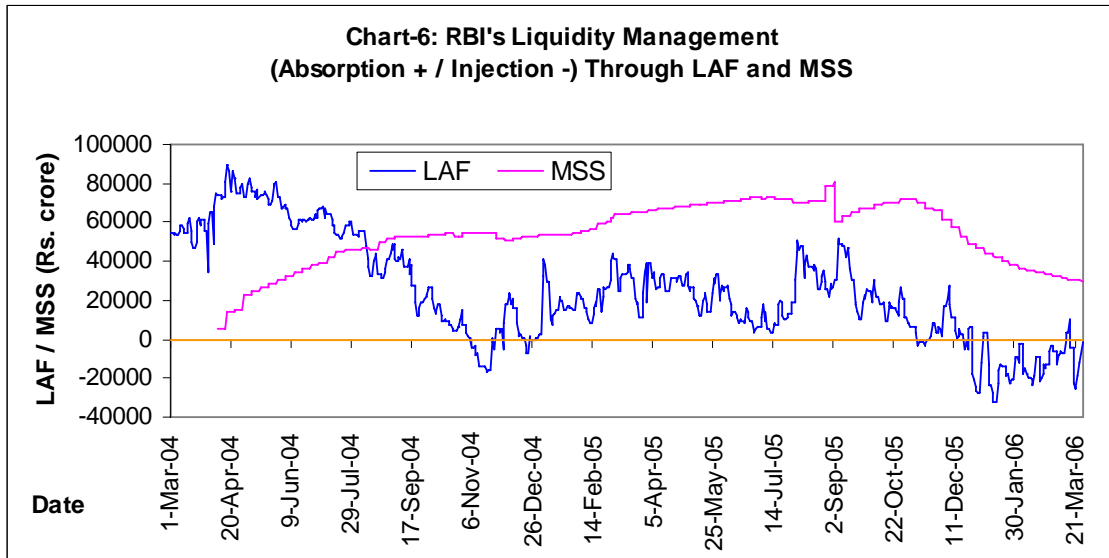
In order to address these issues the Reserve Bank appointed a Working Group on Instruments of Sterilisation (Chairperson: Smt. Usha Thorat). After considerable discussion, the consequence was that the Reserve Bank signed a Memorandum of Understanding (MoU) with the Government of India for the issuance of Treasury Bills and dated Government Securities under the Market Stabilisation Scheme (MSS) on March 25, 2004. The new instrument empowered the Reserve Bank to undertake liquidity absorption on a more enduring but still temporary basis. The objective is to keep LAF for fine tuning on a day-to-day basis, while using MSS to manage sterilisation operations, along with the use of more conventional open market operations (OMO) for the absorption or injection of liquidity on an even more enduring basis. The major features of the MSS are enumerated in Box-II.

As has been explained (Box-II), proceeds of the MSS are held by the Government in a separate identifiable cash account maintained and operated by the Reserve Bank. The amount held in this account is appropriated only for the purpose of redemption and/or buyback of the Treasury Bills and/or dated securities issued under the MSS. The ceiling on the outstanding amount under MSS was fixed initially at Rs. 60,000 crore but in accordance with the MOU provisions was enhanced to Rs. 80,000 crore (discounted value) on October 14, 2004 and has now been reduced again to Rs.70,000 crore. The total outstanding amount absorbed under the Market Stabilisation Scheme (MSS) had increased to over Rs.78,906 crore as on September 2, 2005 but has been unwinding since then and the outstandings have currently dropped to Rs 30,000 crore. Nearly Rs. 50,000 crore of liquidity has been released through MSS unwinding, even while overall marginal liquidity has transited from surplus to deficit.

The introduction of MSS had succeeded in restoring LAF to its intended function of daily liquidity management. With MSS levels averaging about Rs.54,000 crore in November 2004, total surplus liquidity averaged around the levels seen before the introduction of MSS as excess capital flows continued. LAF operations returned to surplus mode thereafter and by March 2005 averaged around Rs.30,000 crore with total surplus liquidity as reflected in LAF, MSS and government cash balances in the vicinity of Rs.1,15,000 crore. By September 2005, total surplus liquidity had surpassed Rs.1,20,000 crore. However, the liquidity situation has changed significantly since then. With the change in stance of monetary policy, hiking of the policy rate four times by 25 bps each since the start of October 2004, high credit growth and bulk redemptions of IMD liability of US\$ 7.1 billion. LAF levels again turned to neutral levels in December 2005 and there have been liquidity injections through LAF thereafter (Chart-6).

Credit growth has witnessed a sea change since mid-2004. Thus, the growth in non food credit in 2004-05 was over 30 per cent, the highest in 35 years. In recent years the banks had been subscribing to government securities much higher than the minimum SLR requirements. Making a forward looking assessment, the Reserve Bank began to unwind MSS from September 2005 and the MSS part in the weekly auctions was discontinued since November 9, 2005. This helped in the orderly withdrawal of liquidity equivalent to US\$7.1 billion involved in the redemption of IMD. Managing bunched

withdrawal of liquidity of such a large size is expected to pose a big challenge for monetary operations. Box-III explains the measures taken proactively by the Reserve Bank, which helped in limiting the liquidity mismatch to a large extent. Coupled with the high demand for credit (31.1 per cent growth year-on-year as on March 17, 2006) that has emerged the liquidity situation has nevertheless changed radically relative to the situation prevailing in most of 2005. The availability of LAF and MSS has enabled the RBI to manage these changes in an orderly manner.



Box-III: Liquidity Management During IMD Redemption

The India Millennium Deposits (IMDs) were foreign currency denominated deposits issued by State Bank of India in 2000, on advice of the Government of India. It mobilised a sum of USD 5.5 billion for a tenor of five years. IMD carried coupons of 8.50 per cent, 7.85 per cent and 6.85 per cent on US dollar, Pound Sterling and Euro denominated deposits respectively. IMD subscription was limited to non-resident Indians, persons of Indian origin and overseas corporate bodies. The interest income earned on IMD was exempted from tax and there was provision of premature encashment after six months only in non-repatriable Indian rupees. These IMDs matured on December 28-29, 2005 and the large sums involved threw a challenge for liquidity management.

Liquidity management in face of IMD redemptions was carried out to contain disequilibrium while retaining monetary policy stance with a medium-term objective. Outflows on account of the redemptions were met by smooth arrangements worked out in this regard. During December 27-29, 2005, RBI sold foreign exchange out of its foreign exchange reserves to State Bank of India (SBI) totalling nearly US\$ 7.1 billion, which in rupee equivalent terms was about Rs.32,000 crore. SBI on its part had built up the necessary rupee resources to meet the obligations. Temporary tightness in liquidity, was met by release of liquidity through repo window (including the second LAF) averaging about Rs.23,000 crore per day in the last week of December coinciding with the IMD redemptions, outflows due to advance tax payments and the continued surge in credit offtake. The second LAF window made available since November 28, 2005 provided an additional opportunity to market participants to fine tune their liquidity management. The smooth redemption of the IMD liability of this size, bunched at a point of time, reflects the growing maturity of the financial markets and the strength of the liquidity management system that has been put in place. Short-term money market rates eased remarkably in the first week of January 2006 reflecting smooth redemptions of IMDs but again firmed up in the second week reflecting pressures emanating from scheduled auctions of Government securities.

The evidence of this efficient liquidity management may be seen in the relatively orderly movement in both exchange rates and interest rates. During times of excess visible liquidity, the call rates have essentially hugged the reverse repo rate, as might be expected, whereas they are near or slightly higher than the repo rate in times of tighter visible liquidity (Chart 5).

Preparing the Markets

An important element in coping with liquidity management has been smoothing behaviour of the central bank and the communication strategy. In August 2004, the headline inflation rate shot up to 8.7 per cent, partly on account of rising global oil prices and partly due to resurgence in manufacturing inflation. The turning of the interest rate cycle looked imminent. The issue was addressed through burden sharing by appropriate monetary and fiscal coordination and by preparing markets for a possible interest rate reversal. In measured and calibrated steps the monetary policy stance was changed and measures such as those on CRR and reverse repo were taken in a phased manner. Also, banks were allowed to transfer HFT (Held for Trading) and AFS (Available for Sale) securities to HTM (Held to Maturity) category, thereby affording them some cushion against the possible interest rate shock. Markets were prepared with a careful communication on the stance of the monetary policy by explaining that the central bank would strive for provision of appropriate liquidity and would place equal emphasis on price stability. It would consider measures in a calibrated manner. Monetary management succeeded in building credibility and keeping inflation expectations low. Headline inflation receded with the year ending with 5.1 per cent inflation. Inflation again surged temporarily early this year, but has been kept under leash even while the central bank moved to mop up excess liquidity. Markets were again told in October 2005 that the central bank is prepared to take measures in calibrated and prompt manner and while genuine credit needs would be ensured, emphasis would be on price stability. Policy communications have been backed by credible actions in accordance with stance to keep inflation in tight leash.

In the more recent period, the IMD redemptions were carried out successfully with temporary volatility in money markets accompanied by liquidity shortages during December 2005. However, monetary policy operations were carried out to contain disequilibrium in line with the monetary policy stance with a medium-term objective. At the same time necessary liquidity has been provided in recent months to address the tighter liquidity due to frictional factors. It may be added that the Reserve Bank has enough instruments to manage liquidity.

Lessons from the Indian Experience & Coping Ahead

What has been the lesson from the Indian experience of coping with liquidity management under large and volatile capital flows?

First, by putting reforms on a more stable footing by adopting gradualism but avoiding reversals, it has been able to sustain capital inflows on a more stable basis with lower volatility than has been seen in some other emerging markets. This has helped central banks in smoothening out interest rates under cyclical transition.

Second, in cases where money and debt markets have depth, development of open market operations through repo operations is particularly important for building up microeconomic capacities for macroeconomic objective of liquidity management. In India, the emergence of LAF was a single biggest factor which helped to manage liquidity amidst large and volatile capital flows and to keep short-term interest rates stable in this environment. It widened the range of instruments for monetary policy and enabled the Reserve Bank to operate on shorter range of interest rates. Restricting the maturities of interest rates at which central bank operates to a smaller range at the short-end has reinforced market functioning.

Third, in the face of constraints on sterilisation arising from paucity of instruments, the monetary authorities in India adopted a careful strategy which preserved the strength of the central bank balance sheet and the credibility of the central bank, while causing minimal frictions in the debt markets. MSS was not contemplated of initially even while capital flows had distinctly increased since 1993-94. However, in face of large surplus liquidity since 2000, MSS was evolved as a very useful instrument of monetary policy to sustain open market operations. MSS has marginal costs, but it has helped the monetary authorities manage business and liquidity cycles through the surpluses and the deficits. With MSS, the monetary authorities now have the option of assigning LAF for day-to-day liquidity management, using MSS for addressing semi-durable liquidity mismatches, while using outright sales/purchases of dated securities for truly long-term liquidity surpluses or deficits. The MSS experience tells us that operating framework and procedures undergo changes and one need to keep innovating to calibrate market operations to the evolving liquidity conditions.

Fourth, by focusing on the microstructure of the markets and by facilitating development of a wider range of instruments such as Collateralised Borrowing and Lending Obligation (CBLO)⁴, market repo, interest rate swaps, Certificates of Deposit (CDs) and Commercial Papers (CPs), in a manner that avoided market segmentation while meeting demand for various products, liquidity management could be placed on a much firmer footing. Market and central bank practices evolved to institutional developments. However, the payment and settlement system proved to be the most difficult area, but one which delivered the enabling environment for micro and macro developments supportive of the liquidity management procedures now in place. The focus

⁴ CBLO is a money market instrument developed by Clearing Corporation of India Limited (CCIL) under RBI regulations. The instrument is issued as a discounted instrument in electronic book entry form to enable eligible market participants to undertake collateralised borrowing or lending from overnight to 90 days maturity. It is in the nature of tripartite repo in which CCIL holds the underlying charge on securities. The product was developed mainly for the non-banks, who were phased out from the uncollateralised call money market during 2001-06. Currently, banks, financial institutions, insurance companies, mutual funds, primary dealers, non-bank financial companies, Non-Government Provident Funds and some corporates are participating in the CBLO market.

on micro-aspects reinforced the central bank's ability to signal and transmit policy changes.

Fifth, with efforts to build up indirect instruments for liquidity management, the transmission of monetary policy has improved. The link between overnight interest rates and yields on T-bills and liquid dated securities has become far stronger. While the lending rates and even more so deposit rates have been taking considerable time to adjust, the strength of the transmission has been in evidence in recent periods. It is important to note that in a situation of large surplus liquidity, the transmission is understandably weaker. However, in the more recent period as considerable amount of excess liquidity was mopped up by the central bank, the rate signal efficacy has gone up substantially.

Sixth, monetary policy setting through signalling improves, as the central bank's liquidity management is able to establish its control over short-term interest rate by reducing volatility in these rates. By removing working balance constraints for the banks, it can influence the term structure of interest rates as reflected in money market rates of various maturities and the sovereign yield curve.

Lastly, while temporary mismatches in liquidity conditions do pose a problem for maintaining immediate goals of monetary operations, the overall objective of liquidity management needs to accorded primacy. In India, in spite of difficulties posed by sudden transitions in liquidity conditions, macroeconomic success of overall policies are reflected in delivering low inflation, which at 4.7 per cent, has averaged below 5.0 per cent over last five years in terms of the headline rate. Consumer price inflation has averaged still lower at around 4.0 per cent on a point-to-point basis and 3.9 per cent on an average basis.

In spite of the relative success in liquidity management in India, several challenges remain ahead.

First, notwithstanding the large size of the debt markets, absence of a vibrant term market, the illiquidity of a large set of securities and limitations of corporate debt market continue to come in way of further contemplated changes.

Second, while the Reserve Bank now enables market participants to meet their marginal liquidity demand twice a day on each working day, there is a moral hazard that passive operations by central bank in the market may be resulting in some market players not doing enough for their own liquidity management.

Third, as the system moves to maintenance of SLR securities at statutory minimum levels, liquidity provision would become more difficult unless the instrument set is widened to facilitate market players to even out their liquidity mismatches.

Fourth, as RBI withdraws from the primary market in accordance with the FRBM Act, 2003, there is an urgent need to bridge the institutional gap with minimal necessary changes so that market operations retain their efficiency, both from the view point of central bank and the market participants.

Finally, further improvements in liquidity management would substantially depend on our abilities to improve forecasting of liquidity in the system. The short span within which liquidity conditions have been changing by a large amount has been the biggest constraint in targeting short-term interest rates. More effort for understanding the fiscal position and the government cash balances, as also the timing of foreign capital flows are of paramount importance in this context.

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