



Central bank management of surplus liquidity

Simon T Gray

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CENTRAL BANK MANAGEMENT OF SURPLUS LIQUIDITY

Simon T Gray

A collection of papers following the Bank of England Centre for Central Banking Studies seminar on surplus liquidity management in February 2006.

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INTRODUCTION	3
CENTRAL BANK MANAGEMENT OF SURPLUS LIQUIDITY	4
A liability or asset-driven balance sheet?	4
Sources of the surplus	5
<i>Foreign exchange reserves build</i>	5
<i>Monetary financing</i>	6
<i>Bank rescue</i>	7
<i>Reduction in reserve requirements</i>	7
Differences from a liquidity shortage	7
Managing the surplus: foreign exchange flows	9
Domestic currency assets on the central bank's balance sheet	11
Co-ordination with government debt issuance	12
The impact of a surplus on financial sector development.....	15
Summary	17
EGYPT: THE NEW MONETARY POLICY FRAMEWORK.....	19
Institutional features:	19
Exchange rate developments :	19
Monetary policy framework :	20
HUNGARY: THE LONG-TERM DRIVERS OF LIQUIDITY	22
The balance sheet of the Central Bank of Hungary	22
The liquidity surplus and the international reserves	24
The consequences of increasing international reserves in Hungary	27
INDIA: MONETARY OPERATIONS & SURPLUS LIQUIDITY	30
Monetary Policy with Large Capital Flows	31
Evolution of the Operating Framework & Monetary Operations	32
Recent Challenges Amidst Change in Monetary Policy Stance	35
RUSSIA: MANAGING SURPLUS LIQUIDITY	41
Russia's Oil Stabilisation Fund.....	44
CBR Monetary Instruments	45
Summary	49
TURKEY: CAUSES AND MANAGMENT OF SURPLUS LIQUIDITY	52
Introduction.....	52
Developments in the main macroeconomic indicators	52
Main determinants of liquidity.....	54
Monetary policy & instruments	58
ANNEX: Monetary Operations - Managing Surplus Liquidity, by Mrs Samia Torky,	
Central Bank of Egypt	61
Introduction.....	61
Monetary Policy Targets.....	61
Monetary Policy Instruments.....	62
The most wide-spread operational framework	66
Liquidity Management.....	66

INTRODUCTION

Following a CCBS seminar in London, in February 2006, on the subject of central bank management of surplus liquidity, participants were invited to contribute to a collection of papers - case-studies of how a range of central banks around the world have tackled or are tackling the issues which arise from excess liquidity in the banking system. One of the aims was to produce something quite quickly. Much more remains to be said about the management of excess liquidity than is covered in this volume; but we hope that it will prove useful material to others who are addressing the same issues.

Interested readers are also referred to the CCBS Lecture Series no. 3: “Surplus Liquidity: Implications for Central Banks”, by Joe Ganley.

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The views expressed in these papers are those of the authors and do not necessarily reflect those of the Bank of England or the central banks of Egypt, Hungary, India, Russia and Turkey.

CENTRAL BANK MANAGEMENT OF SURPLUS LIQUIDITY

By Simon T Gray, Bank of England

A liability or asset-driven balance sheet?

A liquidity surplus in the market means that the central bank has net domestic currency liabilities vis-à-vis the commercial banking sector, rather than a surplus¹. Gross assets represented by claims on the commercial banks may be very small or zero eg occasional use by a bank of overnight standing credit facilities. Lending to problem banks (lender of last resort, or LOLR advances), and subsidised lending to ‘priority sectors’, are excluded here as they are not usually controlled by the central bank. LOLR is normally an unrealisable asset, and may simply represent a loss; and direct lending is normally undertaken at the behest of the government, and cannot easily be controlled. Liabilities may take a range of forms, including excess free balances on the commercial banks’ current accounts; reserve requirements; term deposits; and central bank bills. The relevant items are highlighted in bold in the table below.

Central Bank balance sheet: typical structure

<u>ASSETS</u>	<u>LIABILITIES</u>
Net FX reserves	Currency in circulation
Net lending to Government	Banks’ current accounts excl reserve requirements
Lending to banks (OMO)	Reserve requirements
Lending to banks (SF)	Deposits, central bank bills (OMO)
LOLR & lending to ‘priority sectors’	Deposits (SF)
Other	Capital and reserves
	Other

Where there is a structural deficit of liquidity in the market – so that the highlighted asset items ‘lending to banks’ exceed the four highlighted liability items – the balance sheet is *liability driven*. The economy has a demand for central bank liabilities, predominantly for payments purposes (cash and clearing balances at the central bank; and the central bank lends money to the commercial banks (OMO assets) or may purchase assets from them (normally government securities or foreign exchange) in line with this demand. There will probably be no OMO liabilities. This would describe the position of most developed country central banks: the Bank of England, the US Federal Reserve Bank, the European (System of) Central Banks, and the Bank of Japan.

¹ It could in theory be the case that the surplus is represented by excess cash in circulation (supply is greater than demand) rather than by commercial bank balances at the central bank; this is unlikely although it can be observed in a few countries.

But where there is a surplus of liquidity, the balance sheet is *asset driven*. An exogenous or policy-driven increase in certain asset items results in a balance-sheet expansion greater than that needed to accommodate the economy's demand for central bank liabilities; and the central bank then needs to – or at least should consider – undertaking operations to offset this. In this case, OMO and SF liabilities may be large, and there may be excess reserves in banks' current accounts, while there will probably be no OMO lending.

Sources of the surplus

There are three main sources of surplus liquidity in an economy:

- Foreign exchange reserves build – asset is net FX reserves.
- Monetary financing – asset is lending to government.
- Bank rescue – asset is LOLR credit, and – possibly - ultimately a loss (ie a reduction in the liability item 'capital and reserves'); and/or directed lending.

Foreign exchange reserves build In this case, the central bank is almost certainly pursuing a fixed or managed exchange rate regime, in practice if not necessarily explicitly. Many developing and emerging economies have seen in recent years a substantial inflow of foreign exchange, from a variety of sources:

- commodity exports (notably the case with oil exporting countries²);
- foreign borrowing by the government³ and perhaps by the private sector;
- FDI (in some cases relating to the privatisation of state assets⁴);
- donor funds⁵; and
- remittances⁶.

If the exchange rate is purely floating, the central bank does not need to purchase any of the foreign exchange and there will be no direct impact on domestic currency liquidity. But especially in developing and emerging economies, where (i) these flows may be very

² Nigeria and Russia are good examples of this.

³ Governments which borrow abroad, including from IFIs, typically sell the foreign exchange to the central bank to obtain domestic currency. This is a major source of surplus liquidity in many countries, including Croatia, Hungary, Jamaica.

⁴ Governments privatising state assets typically allow foreign bidders to pay in foreign exchange, and then sell the foreign exchange to the central bank to obtain domestic currency for local expenditure. This has been a major cause of surplus liquidity in Macedonia and Morocco, for instance; and is covered in the paper on Turkey.

⁵ Donor funds are a significant cause of surplus liquidity in many African countries, such as Ethiopia, Ghana, Malawi, Mozambique and Uganda, amongst others.

⁶ In Pakistan, workers' remittances rose from USD1.1 billion in 2000-2001 (13% of exports) to USD4.2 billion in 2004-2005 (29% of exports). Total net private sector transfers rose from 29% of exports to 59% over the same period. This is also an important factor in India.

substantial in relation to other current and capital account flows; (ii) exchange rate stability is seen as the key nominal anchor in delivering low inflation expectations; and (iii) competitiveness is an important factor, it is unusual for the central bank not to intervene.

In the first case, the size of flows coupled with their lumpiness and uncertainties about their durability mean that central banks intervene to smooth exchange rate volatility. This point is clearly brought out in Mridul Saggars' paper on the Indian experience. In the second case, nominal exchange rate stability may be an important tool in creating or supporting expectations of price stability (at least for traded goods). Da Afghanistan Bank and the Central Bank of Iraq operate to smooth volatility for these reasons⁷, but without operating an exchange rate peg as such. Many central banks are reluctant to allow a strong appreciation of the currency, in some cases because of a concern that foreign exchange inflows might not last, and a later unwinding of the flows would result in exchange rate depreciation (possibly overshooting) which would damage expectations of price stability.

In the third case, one of the central bank's goals may be to support the competitiveness of the economy. Strong exchange rate appreciation may be seen as damaging to this; and as disruptive if it might be reversed in the not-too-distant future. Where there is high unemployment, this may be a particularly important factor. By contrast with manufactured exports, foreign exchange flows resulting from commodity exports, foreign borrowing, and to a lesser extent donor funds and remittances, are not directly associated with employment creation. Argentina has an additional reason for monitoring competitiveness: a substantial portion of government revenues come from export taxes. If exports weaken, so does the fiscal position.

Monetary financing Historically, many governments have borrowed from the central bank: this represents 'monetary financing'. A growing trend towards central bank independence, notably since the early 1990s, has been accompanied by a reduction in new loans to government, though in many cases the central bank's balance sheet still reflects past monetary financing. If monetary financing is on-going, it is unlikely that the central bank's lending to the government will be in a readily marketable form. It may simply be an overdraft (eg in Nigeria, Syria), or it may be notional securities but with below-market yields. If the government has stopped monetary financing of its deficits, it may be possible to persuade it to convert its loans from the central bank into a marketable form – securities rather than an overdraft, and with a maturity and yield that would allow the central bank to sell the securities to the market. In Sierra Leone, the government overdraft with the central bank is converted into securities, which can be used in monetary operations, once a year (although the Ministry of Finance does also auction treasury bills once a week). The central bank may need to think creatively in order to mobilise such assets: the modified repo operations used by the Bank of Russia and described in Elena Vasilieva's paper is a good example.

⁷ But there are risks with maintaining nominal exchange rate stability. *"There is a trade-off between the greater short-run volatility of the real exchange rate in a flexible rate regime versus the greater probability of a clearly defined external financial crisis when the exchange rate is pegged."* Stanley Fischer, 1999.

Bank rescue

If a commercial bank runs into difficulties, and maybe is forced into bankruptcy, there may be a short-term increase in demand for liquidity – whether precautionary balances, or because banks are reluctant to lend to each other – but there is no destruction of central bank liabilities. However, if the central bank bails out part of the financial sector, there may be an accompanying large increase in its assets represented by a claim on the failed institution(s). In the stylised balance sheet above, this would be ‘LOLR’. The counterpart central bank liabilities normally end up being held by ‘good’ banks, and constitute surplus liquidity which the central bank needs to drain. Thailand and Turkey are examples of this.

In some countries, the government will at some stage fiscalise the loss, issuing marketable securities in order to recapitalise the central bank. In others, the government issues non-marketable securities which give the central bank positive (notional) capital, but which cannot be on-sold in order to drain the excess liquidity.

In the case of central bank lending to ‘priority sectors’ (National Bank of Belarus, Bank of Lao PDR), or in some cases subsidised lending to commercial banks in support of such credits (eg the State Bank of Vietnam’s lending to State-Owned Commercial Banks), the asset is in theory of good quality; but it is not marketable and cannot be used in support of operations. These loans generate excess liquidity just as much as monetary financing.

Reduction in reserve requirements

In some countries, the proximate cause of surplus liquidity, or of a recent increase in the surplus, may be a reduction in reserve requirements. This is touched on in the papers on India, Russia and Turkey. But the original cause of the excess liquidity, which may have been the reason for high reserve requirements previously⁸, will be one of the three specified above.

The causes may change over time. Some commodity exporting countries for instance indulged in monetary financing for a period, but now find that high world prices for their commodities have allowed the government to repay previous monetary financing (or in some cases to put a stop to new monetary financing, while inflation reduces the real value of historic monetary financing). The central bank’s assets may then change from ‘lending to government’ to ‘net foreign exchange’.

Differences from a liquidity shortage

Where there is a structural deficit, the central bank always lends enough to bring banks back to balance. If the central bank judges that demand for liquidity is growing too fast, it will usually increase the cost of supplying liquidity, whether by raising its policy rate, or forcing banks to borrow more at penal standing credit facility rates. But it will always lend a sufficient volume to offset the shortage. The alternative would be disruption in the payment system: either banks would not be able to purchase enough banknotes to satisfy

⁸ In early stages of transition, many central banks used high reserve requirements as a crude way of sterilising excess liquidity; in some cases there were also prudential motivations.

customer demand, or they would not be able to settle all payments due across the central bank's balance sheet. At the margin, banks might have sufficient funds to make due payments, but would be left with smaller working balances than desired. This would tend to put upwards pressure on short-term interest rates.

But where there is a structural surplus, the central bank rarely drains enough to bring banks fully back to balance. Failure to drain excess liquidity will not cause payment system disruption; rather, it will lead to a reduction of short-term interest rates, with consequences for inflation (if the excess liquidity feeds through to excess domestic demand) or a weakening of the exchange rate (if banks and other economic agents seek higher returns from foreign exchange investments, or take a view that higher domestic inflation will result in a weaker exchange rate in the future).

Some of these consequences might be desired by the central bank. The Bank of Japan's Quantitative Easing Policy (QEP) which involves providing the banking sector with (substantially) more than its desired level of domestic currency liquidity is in part aimed at increasing inflation to positive levels. The paper on Russia notes that the Central Bank of Russia preferred to leave excess liquidity in the market rather than raise domestic interest rates to drain it, as raising rates 'could have provoked additional capital inflow', with an adverse impact on competitiveness (via the exchange rate) and inflation (via excess demand).

Nevertheless, while this may be an appropriate trade-off, it is generally true that failure to manage liquidity weakens central bank control of the financial markets.

From the point of view of the banks, where there is a surplus they do not have to participate in CB operations. If there is a deficit, the market as a whole – and therefore some individual banks short of liquidity - must go to the central bank, and borrow on its terms. But where there is a surplus, the market as a whole – and therefore all individual banks - may choose not to accept the terms chosen by the central bank for draining, and instead maintain liquid assets (their current account at the central bank). One Latin American central bank offered to drain all excess liquidity, but at relatively long maturities (several weeks). Banks chose to maintain liquidity rather than earn interest on excess reserves. A similar trade-off is observable in other countries.

From the point of view of the central bank, draining liquidity costs money, whereas injecting it earns money. If the amount of liquidity which has to be drained is small relative to the central bank's balance sheet, this might not be a major problem for the central bank. Provided the total interest paid on its liabilities (plus any revaluation losses) does not exceed that received from its assets (plus any revaluation gains), it should still operate with a profit. But if the size of interest-bearing liabilities is large, or the interest-rate differential between its liabilities and its assets is large, the central bank may run a loss. The problem can then be compounded as payment of interest on its liabilities will increase the amount of excess liquidity in the market, putting further pressure on the central bank's balance sheet. The Bank of Korea, for instance, recorded a loss in 2004 because of the cost of sterilisation, as did the Central Bank of Armenia. Even small

interest rate differentials may discourage the central bank from draining all surplus liquidity: this is the case in some Gulf central banks.

The paper on India points to the benefits of involving the government in bearing long-term costs of such sterilisation through increased issuance of domestic securities: the Market Stabilisation Scheme securities issued in India are a direct liability of the government, whereas the Monetary Stabilisation Bonds in Korea are a liability of the central bank. In a debate held at the end of the February 2006 CCBS seminar on whether or not Ministries of Finance should bear the costs of sterilisation, the group was evenly balanced between those who felt it important the MoF should cover the costs, to prevent fear of loss distorting the implementation of monetary policy, and those who were concerned that using Treasury Bills might cede control of monetary policy instruments to the Ministry of Finance. The Indian solution appears to work well: MoF securities at market rates are used for structural liquidity management, leaving central bank instruments to implement monetary policy⁹.

One might argue that, at least in the short to medium term, a central bank loss need not be a major problem. But it is observably the case that in many central banks the formulation and implementation of monetary policy is inhibited by the costs of draining excess liquidity. This tends to be exhibited in a varying combination of:

- A temptation to use non-market tools to sterilise, such as raising unremunerated reserve requirements; this may distort markets and discourage intermediation;
- Holding interest rates lower than necessary to meet the inflation target and drain excess liquidity. This in turn will result in higher inflation, and may discourage banking intermediation and financial sector development.

We may conclude that if the central bank's balance sheet is asset-driven, it tends to be in a weaker position than if it is liability-driven. Underlying inflationary pressures – if of a long-term nature - may be hard to resist.

Managing the surplus: foreign exchange flows

If the source of the surplus is foreign exchange inflows on the current account, where the government is earning the foreign exchange, the government could consider setting up a stabilisation fund to smooth the impact of variable income on the domestic economy. A number of countries have set up stabilisation funds in recent years – notably hydrocarbon exporters in the Gulf region, as well as Azerbaijan, Norway, Russia and Trinidad. The government is encouraged to make expenditure decisions on a long-term basis, depending on the needs and absorptive capacity of the economy. If revenues from commodity

⁹ However, in India – as in other countries, including several Gulf countries – the government places a limit on the extent to which it will issue such securities.

exports (or taxes on them) are volatile, this need not affect expenditure if such a fund is properly set up. This will not remove the surplus itself, but will make its management much easier. The paper on Russia covers such a scheme.

If the source of the surplus is foreign borrowing by the government, it may be possible to persuade the government to borrow domestically rather than from abroad¹⁰. It may be cheaper for the government to borrow abroad, narrowly viewed. But if the central bank has to sterilise the resultant creation of domestic currency liquidity, then it may well be more expensive for the state (Ministry of Finance and Central Bank taken together) if the government borrows abroad – quite apart from the difficulties created for monetary management and development of the domestic financial sector.

If the source of the surplus is donor aid to the government, then in theory there should be an equivalent increase in imports or private sector foreign exchange outflows ('absorption'¹¹). This is not by any means the normal experience, although there will be at least some associated increase in imports. But it may be possible to organise the domestic currency disbursements in a way that will at least minimise volatility.

If the foreign exchange inflows are going to the private sector, it is worth considering whether exchange controls or lack of financial infrastructure prevent private sector imports or investment abroad. In some countries, administrative controls imposed by the central bank effectively trap inward flows of foreign exchange, and so create the surplus. While it is understandable that a central bank may be reluctant to abandon such controls quickly, especially if the foreign exchange inflows may be short-lived or quickly reversed, the central bank should certainly consider unwinding controls¹². The paper on India describes one example of gradual dismantling of controls. The paper on Hungary explains reasons why private sector foreign borrowing may justify an increase in central bank foreign exchange reserves¹³.

In the long term, if there are continued foreign exchange inflows into the country, there may be no choice but to accept some degree of real exchange rate appreciation. This might come about through nominal appreciation, or through a stable nominal exchange rate with a higher level of inflation than in the target currency. Some central banks view the distribution effects associated with controlled nominal appreciation to be preferable to higher inflation. In either case, there is a need to be aware of potential risks to financial instability from a combination of low interest rates coupled with real exchange rate appreciation.

¹⁰ See argument in "Reconsidering external financing of domestic budget deficits: debunking some received wisdom", IMF Policy Discussion Paper PDP/00/8 July 2000, Simon Gray and David Woo.

¹¹ See discussion in "The macroeconomics of managing increased aid inflows: experiences of low-income countries and policy implications", IMF August 2005.

¹² One central bank has noted that anti-money laundering (AML) rules in other countries make it hard for its residents to transfer excess liquidity abroad; the consequent need to invest domestically has fuelled a construction boom.

¹³ There may be a moral hazard risk that if the central bank increases foreign exchange reserves to match private sector foreign borrowing, that this will bolster the exchange rate and so make foreign currency borrowing more attractive.

A number of central banks hold a substantial amount of foreign exchange assets, but are reluctant to sell them outright because of the impact on the exchange rate. Can such assets be used in swaps to manage surplus liquidity? A number of developed market central banks do, or at least have the right to, use foreign exchange swaps for liquidity management. Normally, they trade at the market rate, and so are not using the operation to implement a policy interest rate. A range of issues needs to be considered:

- In a dollarised or semi-dollarised economy, switching one transactions currency for another may have little impact on demand. Banks and their customers may be able to use foreign exchange in domestic transactions just as easily as the domestic currency.
- However, banks may prefer to hold foreign exchange, provided they can access investment opportunities with it, if this will give them a return higher than that available on the domestic currency (where they may be no marginal investment opportunities).
- But in a swap transaction, the central bank will pay the domestic currency interest rate on the balances it withdraws from the economy, and receive the foreign exchange interest rate on balances given to the banks. This is likely to be just as expensive as issuing domestic-currency denominated securities and keeping the foreign exchange invested abroad; but will do less to develop the domestic market¹⁴.

Domestic currency assets on the central bank's balance sheet

For liquidity management purposes, the central bank could drain a surplus by taking short-term deposits, or using long-term deposits or issuing long-term securities. (A central bank security is not substantially different to a tradable central bank deposit; securities facilitate liquidity management by individual banks, but require a little more infrastructure.) Many central banks do issue their own securities: Argentina, Armenia, Azerbaijan, Belarus, Cape Verde, Chile, the Czech Republic, Egypt, the Gambia, Ghana, Iraq, Jamaica, Korea, Macedonia, Mexico, Nigeria, Poland, Romania, Slovakia, Slovenia and Thailand to name a few.

The short-term instrument – with a maturity of 14 days or less – can also be used to implement a monetary policy price; the longer-term instrument would normally be issued at a market price. As indicated in the country papers included here, many central banks take the view that a structural position is best handled by structural (ie long-term) instruments, leaving a variable element to be handled with short-term instruments which can be rolled over or left to unwind, depending on liquidity conditions. Poland took this approach in the mid-1990s, issuing long-term bonds to drain the bulk of the surplus. The Banco Central de Chile is probably the longest-maturity central bank issuer, but others also regularly issue long-term securities, eg the Banco de Mexico. A few issue long-term

¹⁴ Using foreign exchange swaps to provide Standing Facility credit to banks which may not hold eligible securities can, however, be a very useful instrument for the central bank.

securities to target a long-term rate: the Bank of Jamaica and the Bank of Korea both target a one-year rate in their securities issuance.

However, there are two reasons in general why a central bank might not issue long-term securities. First, it may want to maintain a certain minimum volume of transactions at its policy rate, and so wish to roll over at least some of the structural position with short-term transactions. Many central banks in practice - whether operating with a surplus or a deficit of liquidity in the market - use long-term, market-priced transactions for part of their operations with the market, and short-term transactions at the policy rate for the rest. A sufficient volume of transactions needs to be at the policy rate for it to impact the market. Second, in developing market countries the yield curve may be steeply positive, and the cost of issuing long-term securities may be deemed to outweigh any associated benefits. This will be particularly important if the central bank is concerned about the risk of running a loss, and the impact of such a loss on its monetary control.

If the surplus has been generated by monetary financing, then as noted earlier, the government should (i) commit to ending monetary financing if it has not already done so and (ii) securitize any outstanding borrowing from the central bank so that the central bank can sell the asset to drain surplus liquidity if necessary.

If the excess liquidity has been generated as part of the rescue of the financial sector (eg bankrupt banks), ultimately the Ministry of Finance will have to pay (unless amounts are small enough). Fiscalising the cost means that the government will need to raise finance in the same way as it does for other expenditures. This could be done as a one-off operation, for instance where the central bank is given securities to restore its capital and reserves; the central bank can then sell the securities to drain excess liquidity in the market. Or the government could accept a lower, or zero, profits remittance from the central bank until such time as the central bank's capital and reserves are restored. In this case the government would have to make up for lost revenue by issuing securities in the market (or borrowing abroad, or cutting expenditure).

Co-ordination with government debt issuance

In some countries, the cause of the liquidity surplus means that the government has little need to issue domestic currency securities. This might be the case if the government benefits from high commodity prices and has a balanced budget and no debt¹⁵; although as suggested earlier, if the government is borrowing abroad, it may make sense to review borrowing practices and raise some finance domestically instead. But if the government does have a domestic currency borrowing programme, then the central bank should consider at least a minimum degree of co-ordination.

¹⁵ Even if it has a budget surplus, there may still be a need to refinance maturities of an existing debt stock.

Structural sterilisation

If the Ministry of Finance can be persuaded to issue securities for monetary management purposes, co-ordination may be simplified, though this is not guaranteed. The paper on India describes one approach: government paper is issued for structural liquidity management purposes, within pre-agreed limits, so that there is only one official issuer in the market. Some Gulf central banks have used this approach, which can work well provided the Ministry of Finance will agree sufficient limits to cope with normal needs. In Sierra Leone, treasury bills are auctioned weekly, and the central bank can vary the amount sold depending on liquidity conditions. A less formal approach could be used: the central bank could from time to time ask the MoF to issue more securities than needed for its own financing purposes¹⁶. The extra funds would normally be deposited at the central bank and remunerated at the issuance yield of the securities in question (if the government simply spent the funds, there would be no net impact on liquidity). There would be no net cost to the MoF of this approach, and there would still only be one issuer in the market. But the timing of MoF issuance may not suit the central bank, and the MoF may fear that the extra issuance volume pushed up yields.

If the central bank engages in longer-term, structural issuance of its own securities, it should be able to plan issuance on a longer-term basis – since it is not reacting to short-term liquidity swings. Korea and Mexico provide an example of this. It should be possible for the central bank to commit in advance to an issuance calendar – eg ‘longer-term securities will be auctioned on the third Thursday of every month’ – and also to give indicative volumes – ‘the central bank aims to drain X billion of the structural liquidity surplus through the issuance of longer-term securities’. This level of co-ordination should be fairly easy to implement. But if structural securities are issued in an ad hoc way, the commercial banks and other market participants may find the uncertainties created can disrupt participation in the Ministry of Finance issuance programme.

If the central bank and MoF are both issuing securities into the same area of the market, it probably makes sense to harmonise features of the securities. They could be held in the same registry, use the same discount yield calculation, be eligible for use as collateral in central bank operations on exactly the same basis, etc. This would make it easier for the market to trade them on the same basis and so enhance liquidity.

In the Gambia, there is close co-ordination between the Ministry of Finance and central bank in issuance of treasury bills and central bank bills, which have a similar structure. Indeed, the yield on short-term treasury bills is the central bank’s policy rate (Central bank bills were issued from 1990, but discontinued because of the impact of issuance cost on the central bank’s balance sheet). In Ghana, the weekly OMO meeting is attended by Ministry of Finance officials as well as central bankers; and discusses issuance of central bank and treasury bills in the coming weeks, in light of a liquidity forecast (BoG bills are sold on Wednesdays with maturities up to 56 days, and treasury bills on Fridays with maturities from 91 to 364 days). It is intended in time to use treasury bills solely for budget financing reasons, and central bank bills for residual liquidity management.

¹⁶ This was done in the UK before the DMO took over cash management for the government.

But such close co-ordination does not always work. One South Pacific country experimented with jointly-issued paper – reasonable on the grounds that the Ministry of Finance and the central bank should have an identical risk profile when issuing in their domestic currency – but found that this was extremely difficult to manage in practice: the Ministry and the central bank were issuing for different purposes, and had different views about the volume/price trade-off at each auction, so that on many occasions it was impossible for both to be satisfied. In Nigeria, a desire by the Ministry of Finance to hold down the costs of debt issuance has in past years meant that the central bank has had to take up large amounts of government securities unsold at auctions, so that at times government debt issuance added to the problem of surplus liquidity (becoming monetary financing) rather than supporting central bank liquidity management¹⁷. The CBN issued some of its own bills to drain excess liquidity, but was constrained by government debt management and P&L considerations.

Short-term liquidity management

It is probably impossible to co-ordinate fully when the central bank is issuing for short-term liquidity management reasons, since volatile and unpredictable liquidity movements may mean that the central bank has very little advance warning of the need. But such OMO are normally restricted to short-maturity instruments, and the auctions conducted once a week; it should then be possible to operate on a day, or at least a certain time of day, that supports rather than clashes with Ministry of Finance issuance. For instance, MoF securities could be auctioned in the morning, and central bank liquidity management operations conducted late morning or in the afternoon that day, after banks know the results of the MoF auction and therefore have an idea of their subsequent cash needs.

Aside from co-ordination in issuance of securities, a Ministry of Finance may be able to support central bank liquidity management through adjustments to its own cash management practices. Some Ministries run an active cash management programme, and minimise cash holdings (the UK is a good example). In some countries the government, including local government, may hold substantial cash balances with commercial banks. This in itself may indicate weak cash management, since the same governments may be issuing domestic securities (at a higher interest rate cost), or selling foreign exchange to the central bank to generate additional domestic currency cash. If the government and its agencies can transfer some of their cash holdings to the central bank, this will drain surplus liquidity from the market in a cost-effective way. The central banks in Nigeria and Russia have both at times encouraged their governments to do this: in Nigeria, for instance, naira 60 billion (over USD 400 million) of parastatal deposits were moved from commercial banks to the central bank in June 2005.

¹⁷ High oil prices meant that from 2005, the CBN was able to reduce holdings of government securities; but purchases of foreign exchange from the government had the same impact on liquidity creation.

The impact of a surplus on financial sector development

Is the impact for market development of surplus market liquidity any different to a situation of shortage? Situations of surplus liquidity are often associated with negligible secondary market trading of securities, and sometimes with weak loan demand; but the causal link is not always clear. And there are a number of markets characterised by a structural surplus of liquidity which nevertheless exhibit a reasonable degree of secondary market trading: Argentina, Croatia, the Czech Republic, Hungary, Korea and Mexico, for instance, describe elements of their interbank and securities markets as active.

If the central bank does not drain all surplus liquidity from the market in its operations, then it is clear that there will be little secondary market trading of securities. If there is a shortage of investment assets which can be bought with central bank balances (part of the surplus liquidity), then holders of assets will be reluctant to sell them, as they are unlikely to be able to employ profitably the cash received. The position may be similar if there were to be an unrelieved shortage of liquidity: if all banks were short of liquidity, there would be little demand to buy securities. Market development will benefit from good liquidity management by the central bank, whether starting from a market surplus or a deficit.

There will be further consequences of ex post (after central bank operations) surplus liquidity. Banks which have a surplus will have little incentive to bid for deposits, as they will not be able to employ the marginal funds profitably. This may mean that they have less incentive to develop customer services. But there is not a parallel with an unrelieved shortage here. In the case of a shortage, banks would indeed have an incentive to attract customer funds, and to improve the efficiency of their cash management operations.

Raising unremunerated reserve requirements would have a different impact on these two areas. By freezing excess liquidity, they might in the short term encourage more trading of securities, since some banks would from time to time be short of liquidity. But, as a tax on banking sector intermediation, higher unremunerated reserve requirements would also tend to discourage that intermediation. Moreover, the banks would have to adjust their interest rate structure in order to recoup the losses caused by the change in reserve requirements; and this would tend to push up both the yields on securities and the cost of borrowing. The former can discourage governments from borrowing domestically (so compounding the excess liquidity problem); and the latter can discourage productive investment¹⁸.

By contrast, if a central bank were to drain excess liquidity by issuing sufficient volume of securities, or taking remunerated deposits, the fact that there was an ex-ante surplus

¹⁸ This was indeed one of the original reasons for using unremunerated reserve requirements: that by widening the wedge between deposit and lending rates, they would make lending more expensive and so slow down the rate of credit growth.

should not of itself discourage financial market development. There may be other factors associated with the cause of the surplus which influence the demand for banking services: monetary financing might be associated with excessive government consumption and so with a sluggish economy; strong FDI might meet the demand for investment financing and leave little for the banks to do; a history of financial crisis might make depositors more wary of using the financial system. But these are not factors which the central bank can itself tackle directly.

Distribution of surplus

In a number of countries where there is an overall surplus of liquidity in the market, there is a strong skew in liquidity holdings. For instance, large state-owned banks, with an implicit (or even explicit) government guarantee might attract a lot of retail deposits, and perhaps government balances; while smaller private commercial banks are short of liquidity. Market segmentation might mean that the large, liquid banks are reluctant to lend funds to the smaller banks (whether for credit reasons or because of anti-competitive behaviour). This is the case in some North African countries, and was a feature of the former centrally-planned economies in Eastern Europe and the Former Soviet Union.

Central banks are normally reluctant to operate as an interbank broker, mediating funds between the 'long' and the 'short' (of liquidity) banks¹⁹. On the other hand, most would like to see more competition in the banking sector – not least because more competition should increase the efficiency of the monetary policy transmission mechanism – and so would like to encourage the smaller banks to grow. One possible response is to facilitate, though not to subsidise, Standing Credit Facility borrowing by the smaller banks. This could involve two aspects: first, adopting a broad definition of acceptable collateral, including foreign exchange; and second, setting an interest rate that is not too penal. A number of central banks facing a large surplus of liquidity note that banks do not use the credit SF, and that while its rate is substantially above market rates or effective policy rates, this does not impact the market. But in some cases, the high cost of SF access means that banks hold large amounts of precautionary liquidity, or will bid relatively high rates for customer deposits (this happens in Russia, for instance). Lower-cost access to the SF, and an acceptance that in a situation of skewed liquidity some banks might need regular access to it, might allow for a more efficient functioning of the market.

Move to a shortage?

Should the central bank aim to move the market to a position of shortage? The answer may depend on the cause of the surplus; and it would be important to consider flows as well as the stock position. There may be little point in undertaking an exercise to move the market into a position of deficit, if on-going flows – capital inflows, or monetary financing for instance – will soon return the market to a surplus.

¹⁹ Some do host a form of interbank market: the Central Bank of Azerbaijan, the National Bank of Georgia, the Bank of Thailand and the Central Bank of Turkey have at times hosted a form of interbank market.

Normally, the central bank could only move the market to a liquidity deficit by selling assets from its balance sheet – foreign exchange or government securities. This is unlikely to be possible, at least without (i) policy changes regarding the exchange rate or (ii) incurring a loss (it is rare that central banks facing a market surplus of liquidity hold a substantial volume of marketable government securities which are booked at market value). The central bank could try to sell sufficient volume of long-term securities to force the banks to borrow short-term from it. But it is normally the case that central banks facing a market liquidity surplus are working with a yield curve that is positively, sometimes strongly positively, sloped. Borrowing long and lending short is nearly always seen as too expensive in these circumstances; though if the central bank believed that changes in the market meant that a structural shortage would soon emerge, it might be prepared to pay the cost for a short period.

An alternative approach, adopted by the National Bank of Croatia²⁰, was to adjust the basis on which banks pay reserve requirements. In Croatia, the NBC switched the requirement to denominate reserve requirements in domestic currency for domestic currency liabilities, and foreign exchange for liabilities denominated in foreign exchange, to require 50% of reserve requirements on foreign exchange liabilities be paid in domestic currency²¹. This increased the banks' demand for kuna without increasing the overall level of reserve requirements. It did however alter their foreign exchange open position; some countries have adjusted reserve requirement calculations in the opposite direction, in part to ease the open foreign exchange position of the banking sector^{22 23}. Changing the currency of denomination of reserve requirements may also have a similar impact to foreign exchange intervention. In Croatia's case, this would have strengthened the kuna by increasing free holdings of foreign exchange while boosting demand for kuna.

Summary

The following papers represent case studies of the causes and management of surplus liquidity in a range of countries. In some cases, the problems arising from surplus liquidity need to be considered in the light of benefits to the economy from the cause of the surplus. A colleague at the Central Bank of Nigeria has noted recently that “the revenue from oil is both a curse and a blessing to the monetary authorities.” Many would

²⁰ The NBC's balance sheet is dominated by foreign exchange assets (some 95% of total); this reflects government borrowing in foreign currency, and strong FDI.

²¹ Developed market central banks which impose reserve requirements (or accept reserves deposits by commercial banks) as a rule accept only domestic currency. The use of foreign currency for reserve requirements is a reflection of the balance sheet structure of commercial banks in some countries, which are predominantly in foreign currency (itself a reflection of customer preference and a measure of distrust of the domestic currency).

²² If the nominal exchange rate is stable, an open position need not cause problems, though it still represents a risk. If the domestic currency is appreciating, banks may even profit from a long position in that currency; and it is possible that denominating reserve requirements in domestic currency may encourage the banks to seek domestic rather than foreign currency deposits.

²³ The Central Bank of Armenia, and the Bank of Lao PDR, have both moved in the opposite direction to Croatia, to allow banks to place foreign currency reserve requirements against foreign currency liabilities.

echo this sentiment: the economy is better off with high export revenues; but high revenues do need to be managed, and can leave monetary authorities with hard choices. In other cases, the cause of the surplus – monetary financing or financial sector crisis – are problematic in themselves.

For some of the problems arising from surplus liquidity there are solutions: some are described here. Others give rise to hard choices; we hope at least that the experience of others will help in clarifying the nature of those choices. In some cases, the financial cost to the central bank of maintaining a particular policy stance (normally, preventing exchange rate appreciation) may indicate that the policy is unsustainable. Yet other problems simply point to a cost to be borne; but it is as well to recognise that at times there is no solution, simply a price to be paid for past policy choices.

EGYPT: THE NEW MONETARY POLICY FRAMEWORK

Samia Torky, Central Bank of Egypt

Egypt has witnessed a comprehensive reform process in the area of monetary policy, institutional developments and a new framework for monetary policy as follows:

Institutional features:

- The central bank is no longer under the supervision of any one ministry, as it was in the past. In September 2002; President Mubarak placed the CBE under his direct authority rather than that of the prime minister.
- The institutional framework of the central bank of Egypt is established by the law no. 88 of 2003 of the central bank, banking sector and monetary system. This creates provisions for disclosure and transparency in the central bank's activities. According to the law, the CBE is responsible for formulating monetary policy and supervising its implementations, realizing price stability and banking system soundness with the context of the general economic policy of the state.
- The Monetary Policy Coordinating Council has been established by a presidential decree in the year 2005. The council chaired by the prime minister, includes three government ministers, the governor of the central bank, the two deputy governors, and six economic and financial highly-ranked independent experts. The council aims to a greater degree of coordination and coherence between fiscal and monetary policies.
- The monetary policy committee (MPC) has been established which is the body responsible for taking monetary policy decisions. The committee has nine members comprising the governor of the CBE, the two deputy governors, and six members of the board of directors. The MPC normally convenes on the first Thursday of each month for the purpose of deciding on its policy rates, and issues a communiqué immediately following its meetings.
- A monetary policy unit within the CBE has been established (MPU) moved out of the banking control department so that it now reports directly to the CBE governor. The unit is currently undergoing restructuring and rationalization of staffing levels, with new staff and technical expertise being brought, in addition the MPU staff are receiving training and educational programs to improve capacity.

Exchange rate developments :

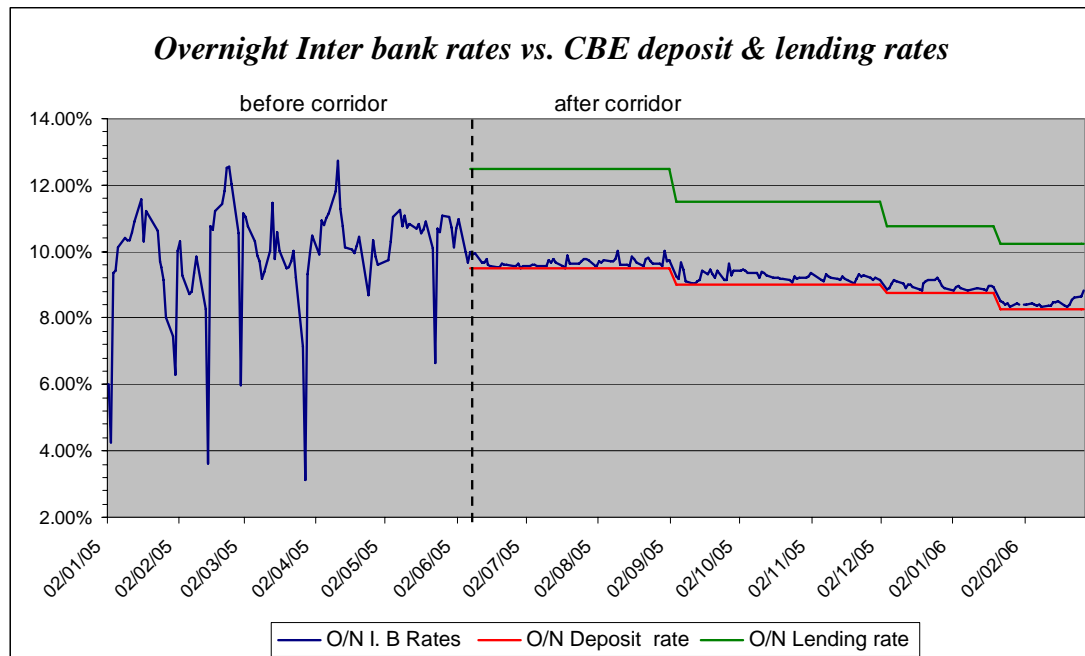
- In January 2003, the CBE abandoned the managed peg system and floated the pound.
- As of December 2004, the foreign exchange interbank market has been launched, and working actively, the CBE announced its commitment to a market-determined exchange rate.

- A successful unification of exchange rate has been achieved, in particular the disappearance of the parallel market premium, which has removed a serious distortion from the economy.

Monetary policy framework :

- Following the abandonment of the exchange rate as a nominal anchor, the CBE announced its intentions to put in place a formal inflation targeting framework to anchor monetary policy once the fundamental prerequisites are met. This will further enhance the predictability and transparency of the monetary policy in Egypt. In the transitional period, the CBE intends to meet its inflation objectives by steering short-term interest rates, keeping in view the developments in credit and money supply, as well as host of other factors which may influence the underlying rate of inflation.
- The CBE intensified efforts to develop a cohesive and credible monetary policy framework that effectively anchors inflation expectations in the context of a flexible exchange rate, which relies on a proactive interest rate policy.
- A new framework for monetary policy implementation has been established including :
 - Changing the operational target for monetary policy to be the overnight interbank rate instead of excess reserves.
 - Defines a set of instruments and procedures. The set of instruments enable the central bank to exert control on the money market conditions and steer short-term market interest rates. Through the short-term interest rates, the central bank can influence the developments of other economic variables, such as investment and consumption decisions and ultimately inflation developments. The CBE provides two standing facilities (an overnight lending facility and an overnight deposit facility) as its main policy instruments, providing the outer bounds of a corridor within which the overnight interbank rates fluctuate. The CBE continues to manage market liquidity through its open market operations.
- The new framework has been put in place as of the 5th of June 2005, as the first meeting for the MPC was held on the 2nd of June 2005. At the first monthly meeting the MPC decided the overnight deposit rate and overnight lending rate to be 9.5% and 12.5% respectively. Several meetings have been held up till now, the rates have changed during the period of eleven months until they reached 8% and 10% respectively.
- To enhance credibility and transparency, the CBE communicates more clearly to the market. A monthly statement is published immediately following the Monetary Policy Committee meeting explaining the general direction for its strategy. The first statement for monetary policy was published on 2 June 2005 which assured the central bank focusing on price stability (low and stable inflation).

The chart below clarifies the limited variations for interbank rates after the corridor system has been implemented :



- ◆ Since the application of the new framework, average overnight interbank rates for the period January/June 2005 were 9.6% compared to 8.1% at 11 May 2006. Customer deposit rates were 7.5% in June 2005 compared to 7.2% in March 2006. Average lending rates were 13.37% in June 2005 compared to 12.6% in March 2006.
- ◆ In spite of the huge liquidity surplus, retail credit growth is too low.

HUNGARY: THE LONG-TERM DRIVERS OF LIQUIDITY

Peter Koroknai, Magyar Nemzeti Bank

Hungary is a small open economy in the middle of Europe, it joined to European Union in 2004. The exchange rate regime was a crawling peg till 2001, after which the National Bank of Hungary (NBH) widened the band and introduced inflation targeting. Inflation became relatively low (3-4% in 2005) and economic growth is strong (4-5% in recent years). The main problems are the high fiscal and current account deficits.

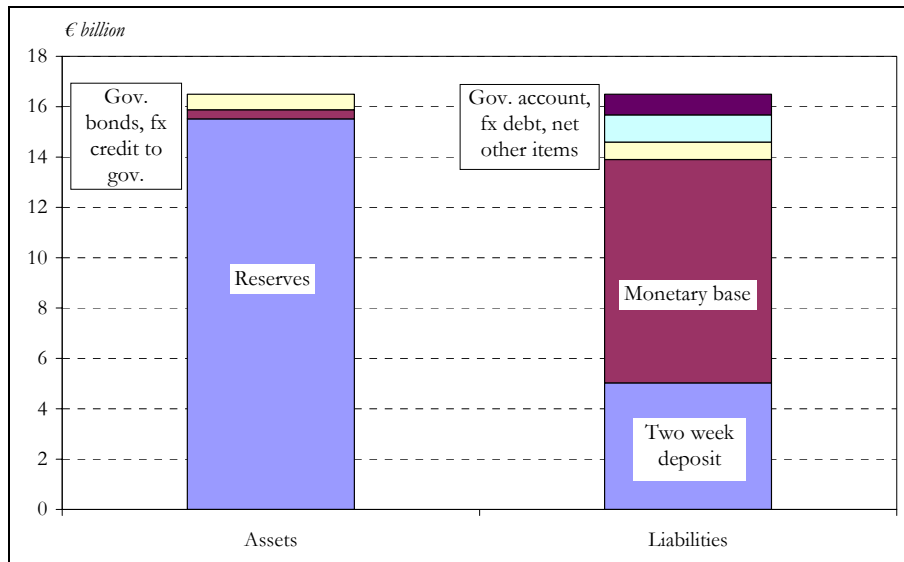
Because of the existing liquidity surplus, in Hungary the key instrument of the central bank is the interest rate on 2 week deposit. The level of liquidity surplus changed a lot in the past 6 years. In this paper we show the factors that mainly influenced the level of surplus. The paper includes 3 main parts.

- Firstly we examine the balance sheet of the NBH, and the factors that affected the liquidity surplus in Hungary in the last 6 years.
- Secondly we note that that in Hungary it is the international reserves that determine the changes in liquidity surplus; and in this part we reveal the factors that determine the optimal band of international reserves, thus the level of foreign reserves in Hungary.
- Finally we mention some Hungarian specifics related to reserve strategy, and related problems.

The balance sheet of the Central Bank of Hungary

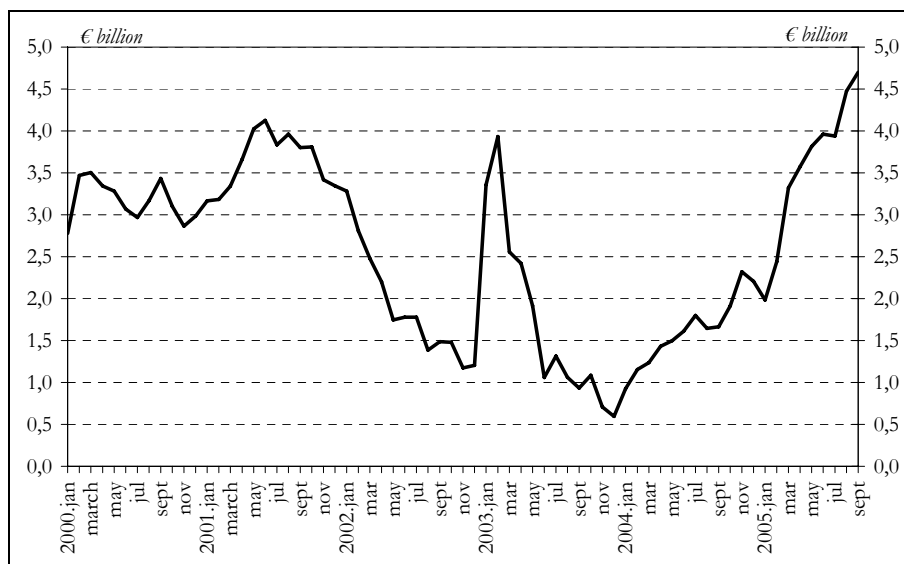
The balance sheet of the NBH contains the usual items: on the asset side the most important item is foreign reserves (Chart 1). On the liability side the largest item is the monetary base – ie cash in circulation, and commercial banks' current account at the NBH. There are some items of the government on both side, but their amount is relatively small. The liquidity surplus caused mainly by the large amount of foreign reserves is sterilized by the 2 week deposit, a standing facility and the key instrument of the central bank.

Chart 1: The balance sheet of NBH (December 2005)



The liquidity surplus (represented by the two week deposit) has changed a lot in the past 6 years (Chart 2). From 2000 to 2001 it was relatively stable, then till the end of 2003 it decreased significantly (apart from the speculation period in early 2003, when the NBH bought foreign exchange to offset upwards pressure on the forint), while from 2004 the liquidity surplus has increased. Since the liquidity surplus is a residual item in the balance sheet, in order to explain the main trends of changes, we have to analyse the changes of the elements of balance sheet and the related flows.

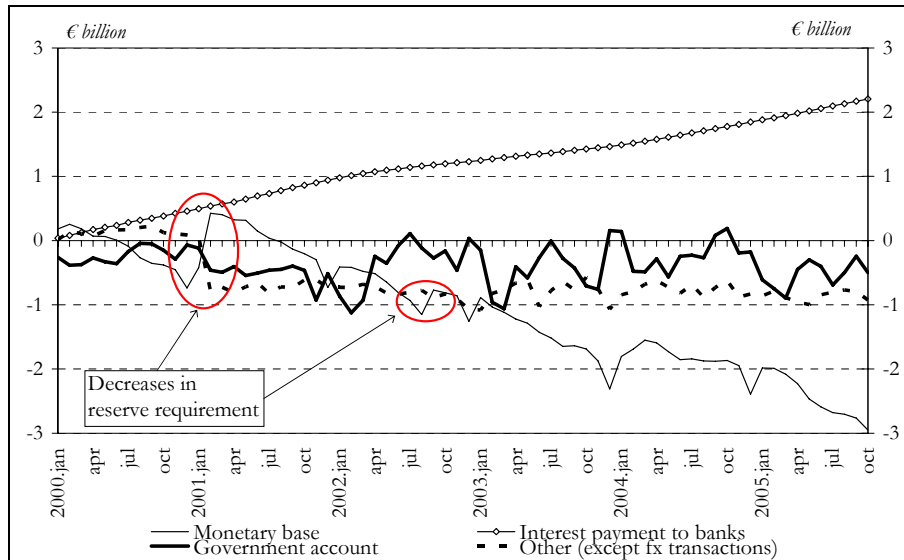
Chart 2: Level of liquidity surplus



As Chart 3 shows, the monetary base absorbed about 3 billion euro in 6 years. This absorption arises from two contrary sources: currency in circulation increased by a relatively stable rate (because of inflation and economic growth) absorbing about 4

billion euro, while the decreases in the reserve requirement ratio injected about 1 billion euro. The liquidity effect of a large decrease in reserve requirement ratio in February 2001 was counterbalanced by issuing bonds by the NBH (see other items on Chart 3).

Chart 3: Cumulative effects of different factors to liquidity surplus



The monetary base line includes the seasonal end-year increase in demand for currency in circulation, which reduces the liquidity surplus temporarily.

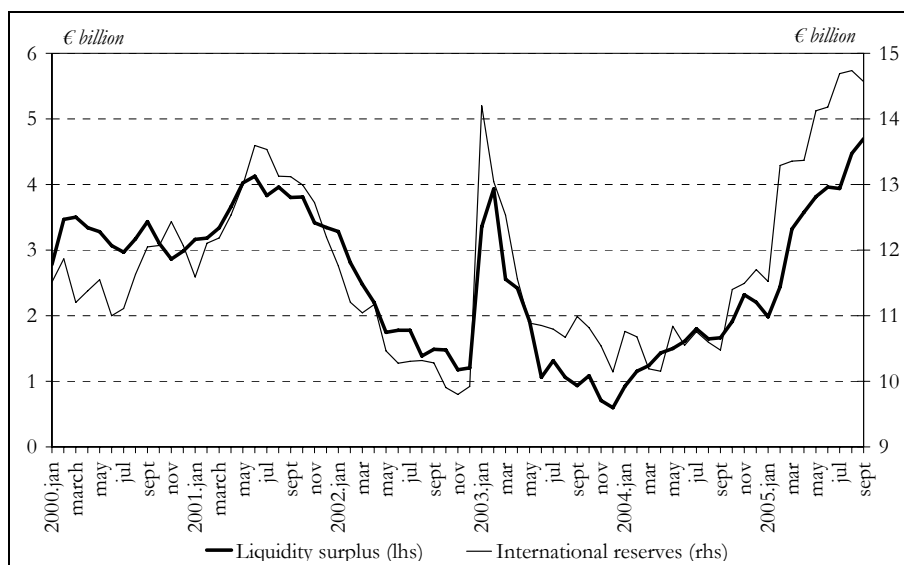
The other main effect influencing liquidity surplus is the interest payment to banks on reserves and two week deposits. The interest payment is determined by the stock of deposits and the interest rate paid on it. That is the reason why in the period of lower liquidity surplus from 2002 to 2004 the interest payment was lower – the line in chart 3 is flatter at this point.

The effect of the government account on liquidity surplus is almost neutral in the long run.

The liquidity surplus and the international reserves

The above-mentioned effects drained about 2 billion euro in the past 6 years roughly smoothly, so can not explain changes in liquidity surplus. We have not mentioned only one important factor: the foreign exchange transactions. So the conclusion is that foreign exchange transactions (thus the level of foreign reserves) determine the level of liquidity surplus (Chart 4).

Chart 4: Liquidity surplus and international reserves



Once again: generally we can state that the liquidity surplus in Hungary is determined by the level of international reserves, so in order to explain the changes in liquidity surplus, after all we have to explain is the changes in foreign reserves.

The objective of foreign reserve strategy is to sustain the necessary level of reserves – that means, a level that investors find satisfactory. Any other level of reserves would mean additional costs for the central bank.

- 1) If the level of the international reserves is considered to be insufficient, it can undermine the credibility of the exchange rate regime and increase the exposure to contagion and increase country premium.
- 2) Above the optimum level, there is no additional benefit from holding more reserves, while it has a price that is the difference between the yield on the reserves and the funding cost. In case of Hungary due to the country premium and the longer maturity of the central bank's foreign asset portfolio, the funding cost is higher.

The NBH takes into consideration several standard reserve adequacy rules in order to determine a relatively wide band for the optimal level of reserves: for example the Guidotti²⁴ rule, the monetary base rule and the stress test. The NBH does not use the indicators like import cover, because they do not seem very relevant economically.

- The Guidotti rule implies that foreign reserves should exceed the volume of the short term debt of the economy. As an adjustment, the short-term debt of the Hungarian economy is reduced (increased) by the net derivative assets (liabilities) of the banking sector.

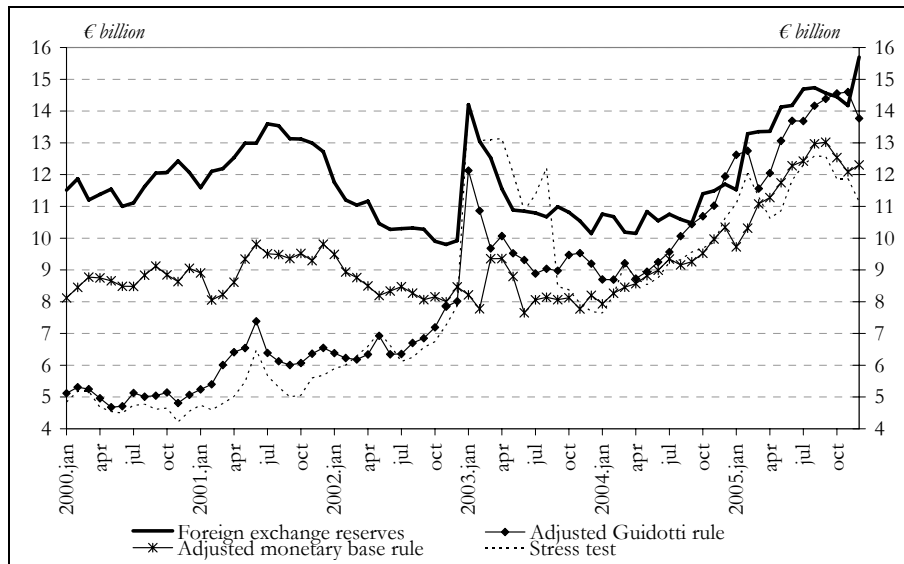
²⁴ See references at end of paper.

- The stress test shows us the potential amount foreign investors could take abroad. The main element of this indicator is the Hungarian government bonds owned by foreigners.
- The monetary base rule basically means that the reserves should cover the monetary base. Because of the high level of liquidity surplus, we adjust the monetary base with the short term liabilities of the central bank (2 week deposit), because this amount also could be converted in the short run. The adjusted monetary base rule is endogenous: not only the higher reserves cause higher liquidity surplus, but (because of the increasing 2 week deposit) the higher liquidity surplus also results in higher optimal reserve.

Theoretically, the reserves should be at least as much as the highest of these criteria shows. Nonetheless, because of the costs of holding more reserves the NBH usually tolerates somewhat lower level of reserves, and tries to hold the reserves in a certain band.

Now looking at Chart 5, we can identify the main factor of changes in liquidity surplus. Till the middle of 2001 the level of reserves was relatively high because of the narrow exchange rate band. The more flexible an exchange rate regime is, the less foreign reserves are considered to be enough to maintain the regime. So after widening the exchange rate band, the NBH could take into consideration the optimal band of reserves of 8-10 billion euro, determined by different rules. That is the reason why the NBH decided to decrease the level of reserves and thus the liquidity surplus. In early 2003 a speculation aiming to move the band took place so the NBH had to intervene in the foreign market causing the reserves to rise temporarily. Apart from this period the level of reserves was steadily low. From the middle of 2004 the household sector started to take foreign exchange credits that are financed by short term foreign credit of the banks, so the Guidotti rule and stress test indicated a significant increase in the optimal band of reserves of 13-16 billion euro to the end of 2005. As a consequence, the liquidity surplus also increased that caused an increase in the adjusted monetary base rule too. After all, the NBH had to increase its reserves to satisfy the adequacy rules.

Chart 5: International reserves and the adequacy rules

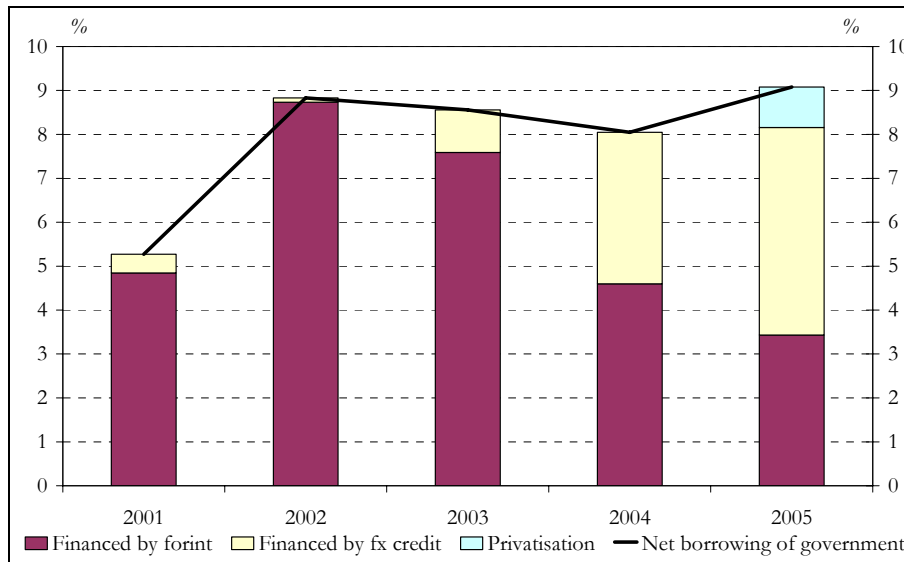


The consequences of increasing international reserves in Hungary

How could the NBH increase the level of reserves? The level of reserves is determined by the foreign intervention of central bank, the maturing debt of the central bank, the transactions with European Union and the foreign transactions of government like privatization, interest payments on foreign debt and new foreign credit. From among these factors only the new foreign credit is endogenous, so the NBH can influence the level of reserves by changing the foreign credit.

Now we have to tell some words about the Hungarian system to understand the situation. Firstly, in Hungary only the government can take foreign credit from abroad, the NBH can not. Secondly, all the foreign transactions of government are changed at the NBH, not at the market. The consequences of these circumstances are as follows: changes in foreign reserves are controlled by government, the influence of NBH is limited, and therefore the level of liquidity surplus is also influenced basically by government. Now let's see what happened in 2004, when the NBH established that the optimal level of reserves was increasing and wanted to raise the level of foreign reserves. NBH suggested to the government to increase foreign reserves without raising liquidity surplus, which could be done by depositing foreign credit at NBH, or repaying forint denominated credit at NBH. However, the Hungarian government decided another alternative: it took foreign exchange credit from abroad and used it to finance fiscal deficit (Chart 6).

Chart 6: Structure of deficit financing (as percent of GDP)



What are the consequences of this solution? On the one hand, the fiscal expenditures, namely the interest payment of the government is lower, because of lower foreign exchange interest rate. The interest payment is also decreased by the lower domestic interest rate because of the lower domestic government bond supply.

However, the disadvantages of this solution seem to be much more.

- Firstly, the decision of the government causes liquidity surplus to be raised significantly, so interest payments at NBH are higher by about the amount of savings at the fiscal side.
- Secondly, though the higher share of foreign public debt is accompanied by higher foreign exchange reserves (thus the open position of the state does not change), there exists exchange rate risk: if the exchange rate depreciated, the public debt would be higher hurting the Maastricht criteria.
- Thirdly, the lower domestic government bond supply results in a low domestic interest rate that is not based on fundamentals.
- And fourthly, there is a real serious risk of the government's solution that it financed the deficit from foreign credit instead of domestic government bonds. This solution means after all that the state finances the deficit from the two week deposit, in other words the average maturity of the government debt decreases very much, that means a higher interest rate risk because in the case of a crisis, the government has to pay higher interest rate on the two week deposit immediately.

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INDIA: MONETARY OPERATIONS & SURPLUS LIQUIDITY

Mridul Saggar, Reserve Bank of India

Mridul Saggar

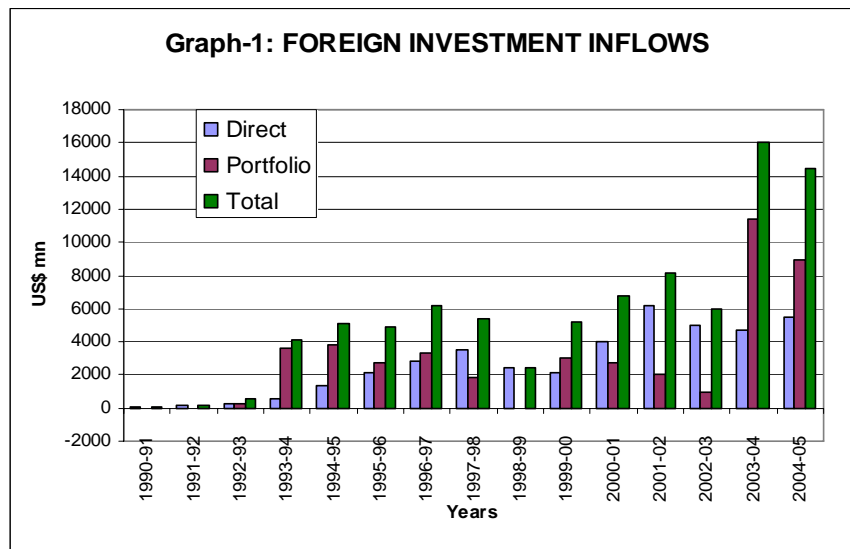
Conduct of monetary policy and management of large and volatile capital flows has proved to be an arduous and thorny issue for many countries. As India liberalized its capital account in a carefully sequenced manner of reforms after the balance of payment crisis of 1991, it too was faced with similar problems. The policy mix involved a carefully calibrated policy which took into account diverse objectives of central banking, a change in monetary policy framework and operating procedures and increased set of instruments for liquidity management. In recent times, the policy mix concentrated on a strategy which eschewed the classical trilemma problem, gave considerable emphasis on affecting expectations and communicating with financial markets, especially to prepare them for the impact of possible interest rate reversal. The Indian experience suggests that while theoretical underpinnings of the policy cannot be avoided, it is important that central banking policies lay emphasis on modulating policies based on practical microeconomic considerations and operational details with a view to remove constraints and develop institutions.

In the 1990s, a large number of central banks faced the problem of liquidity surpluses as capital accounts were liberalized and large capital flows occurred from developed to developing countries. Increased capital inflows have been a major, though not the only source of surplus liquidity in many emerging markets. This is typically the case when country receives large direct or portfolio investments, or remittances in form of foreign currency bank deposits. Managing surplus liquidity could pose substantial difficulties if there is a continuous inflow of liquidity, leading to accretion in liquidity surpluses with the banks. The policy response requires innovative actions by central banks covering not just monetary policy, but also the operating framework in which monetary policy is conducted.

This paper provides the Indian experience in this respect, focussing on how the operating framework evolved and how monetary operations were conducted through increased reliance on indirect instruments of monetary control in recent period. Section-I of the paper explains the problem of monetary management arising from large capital inflows. Section-II details the central bank response in developing an operating framework based on indirect instruments of monetary control. Section-III brings forth the more recent problems in liquidity management arising from transition in liquidity conditions from marginal surpluses to deficits. The paper concludes by highlighting major lessons from the Indian experience.

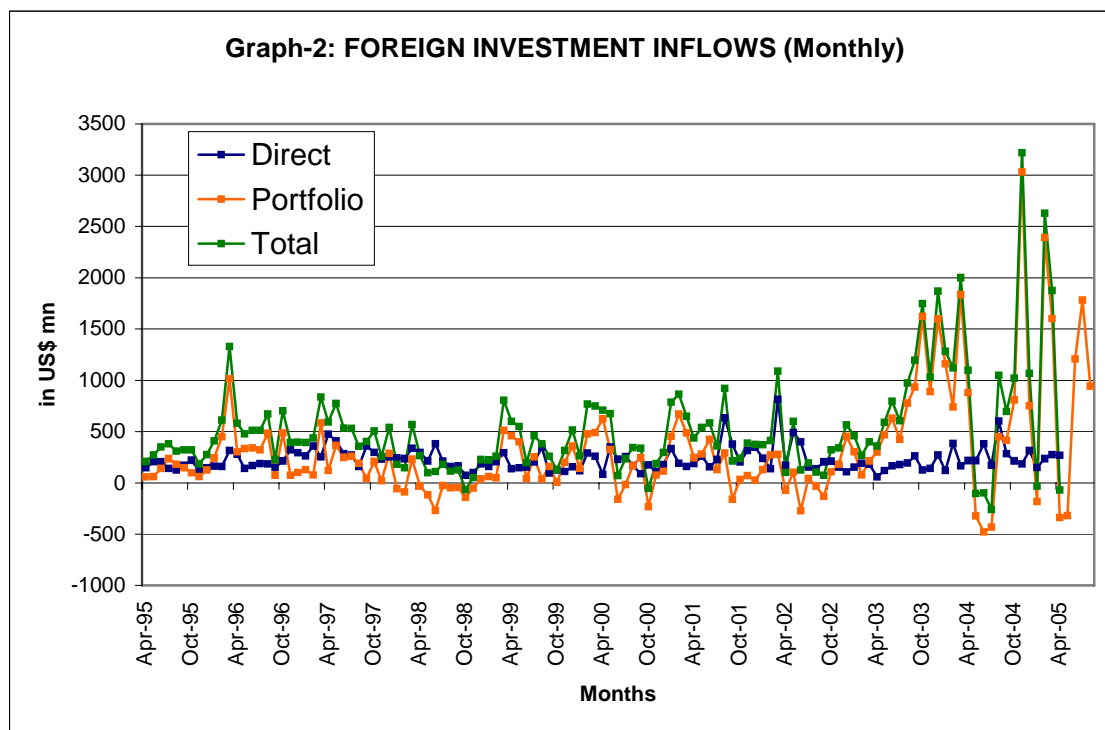
Monetary Policy with Large Capital Flows

Far reaching reforms were unleashed in India since mid-1991 after the country faced its worst ever balance of payments crisis following the fiscal profligacy of the 1980s and the oil price shock of 1990-91 following the Gulf War. India's foreign exchange reserves dwindled to less than US\$ 1 billion at one stage, not even enough to meet a week's import requirements. The country faced the spectre of its first ever external debt default. Policy makers reacted with alarm and alacrity and launched the country on path of all round reforms covering both financial and real sectors. First, the currency was devalued in two quick steps by about 18-20 per cent against world major currencies²⁵. Two years later, the Indian rupee was made fully convertible on current account and in phases capital account was substantially liberalised over five years or so²⁶. In response to the opening of the economy and commitment to structural reforms, starting 1993-94, India has received large portfolio and direct investment flows. These flows were in the region of US\$ 4-6 billion per year during 1993-94 to 1997-98, before the flows abated temporarily due to the contagion from East Asian crisis. Industrial production decelerated and the monetary authorities responded with easing of monetary policy through soft interest rate bias in an effort to pump prime the economy. Together with credible reforms, restructuring of the corporate sector and boom in new economy information and communication technology (ICT) segment, capital inflows revived in a big way. Total capital inflows have averaged US\$ 15 billion a year during 2003-04 and 2004-05 posing serious problems for sterilizing these flows (Graph-1). Preliminary estimates



²⁵ On July 1, 1991 the rupee was adjusted downward by 7 to 9 per cent against the five major international currencies - USD, DM, yen, Pound sterling and French Franc. Next, there was a further downward adjustment by around 11 per cent on 3rd July, 1991. Cumulatively, this amounted to a depreciation of 17 to 19 per cent in the value of rupee against major currencies.

²⁶ India accepted current account convertibility obligations under Article VIII of the Articles of Agreement of the IMF on August 20, 1994.



suggest that in 2005-06 also, direct and portfolio flows were of a similar magnitude. While on an annual basis these flows have stabilized at a high level, month-to-month and intra-month volatility has been very large (Graph-2). In addition to direct and portfolio investment foreign investment flows, capital inflows also came in form of external commercial borrowings raised by Indian firms abroad and non-resident deposit inflows. However, while other flows have been relatively calibrated, predominance of portfolio flows in the overall capital flows has become a major source of volatility of overall flows and made liquidity management difficult.

The central bank with the objectives of curbing excessive exchange rate volatility and maintaining orderly conditions in the foreign exchange market, preventing undue appreciation of the domestic currency and providing sufficient insurance against currency turmoil as witnessed during the East Asian crisis, has been intervening in foreign exchange markets from time to time. As a result, foreign exchange reserves rose from less than a billion US dollars at the time of 1991 crisis to over US\$ 157 billion now.

Evolution of the Operating Framework & Monetary Operations

The reforms in the 1990s facilitated several changes in institutions and market practices in the financial markets. The main changes which facilitated this process are: (i) Yields in the government securities market were made market determined with the introduction of 91-day and 364-day T-bills and through widening and deepening of both the primary and

secondary G-sec markets²⁷, (ii) automatic monetization of budget deficits was stopped with the signing of the Supplemental Accord, (iii) partial removal of credit ceilings and interest rate controls²⁸, (iv) introduction of several new money market products, including repo amongst market participants (market repo) CPs, CDs, IRS/FRAs, etc, (iv) introduction of repos with RBI under Liquidity Adjustment Facility (LAF). There was also evidence of increased integration among various financial markets. The money market had integrated substantially with 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. All these developments supported transition in monetary policy framework (Mohan, 2006).

Financial sector reforms and financial innovations, together with the developments mentioned above, led to central bank slowly undertaking transformation of the monetary policy operating framework from direct to indirect instruments of monetary control. The transition process confirms the view expressed by Alexander, *et al.* (1995) that the process is a lengthy one with most countries taking 5 or more years to make the transition to indirect instruments. However, the transition in framework became necessary as money demand stability became weaker, money multiplier less predictable and disequilibrium in money markets had begun to be reflected in short-term interest rates. Also, exchange rate had become weakly endogenous to money, income, prices and interest rates (Ray, *et al.*, 1998).

The evolution to the framework which targets short-term nominal interest rate, as advocated by Borio (1997) was a slow process for it involved many changes which covered instrument development, setting up of institutions, changes in market practices and development of human capital through training and learning by doing. Reserve Bank supported this process in a number of ways, which covered its own policy actions as also guiding and helping financial markets develop the necessary skills.

At its own end, reserve requirements in the form of Cash Reserve Ratio (CRR) were brought down from 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. Statutory Liquidity Ratio (SLR), which directs banks to maintain liquid investments in the form of eligible securities (mainly government securities), was reduced from an all time high of 38.5 per cent during September 1990 to statutory minimum of 25 per cent by October 1997. Bank rate, which was the refinance rate, was activated in the second half of the 1990s as signaling instrument for monetary policy stance and was used both ways to tighten or ease monetary policy. For instance, it was cut thrice by 100 bps each during 1997 before being hiked by 200 bps in January 1998 to 12.0 per cent to contain contagion from the

²⁷ T-bills were earlier auctioned on tap at fixed coupon of 4.6 per cent

²⁸ Some credit ceilings continue in the form of directed lending stipulating targets for priority sector lending to agriculture, small scale industries and some other forms of lending such as that to small housing loans, loans to small transport operators. Interest rate regulations now remain only on saving deposit rate, some NRI deposit rates, lending rates for small loans in general and small crop loans for seasonal agricultural operations.

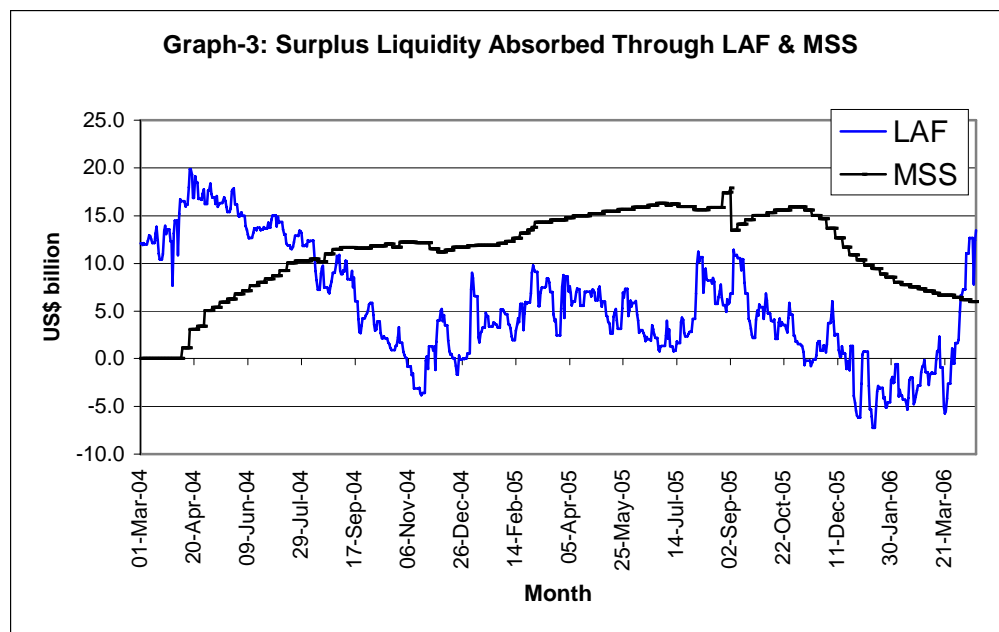
East Asian financial crisis. Once the contagion risks dissipated, bank rate was lowered 10 times and brought down to 6.0 per cent by April 2003. In recent years, with the phasing out of refinance schemes and its replacement by collateralized repo deals with the central bank, the bank rate has lost its relevance, though it is said to signal the medium-term policy stance²⁹. For all practical purposes, the repo/reverse repo rates have become the signaling rates and with economy in surplus mode of liquidity for most of the recent period, the reverse repo rate has emerged as the policy rate for the central bank.

The development of repo market took a long time with first experimentations being made in December 1992 when the central bank began absorbing excess liquidity through auctions of reverse repos. With tightening of monetary policy in 1995, the reverse repos were discontinued but by 1997 reverse repos were re-introduced. The auctions were changed to fixed rate. In April 1999, an Interim Liquidity Adjustment Facility (ILAF) was started with both, repos and reverse repos. A Liquidity Adjustment Facility (LAF) was formally introduced in June 2000. Reserve Bank began providing discretionary liquidity support through repos in addition to the standing facilities and the Reserve Bank started removing the standing liquidity facilities. Although initially repo auctions were conducted at variable rates, with a view to providing quick interest rate signals, RBI over time moved to fixed rate auctions. LAF brought many advantages apart from facilitating a shift from direct instruments of monetary control to indirect. It provided a key instrument for central bank for monetary policy operations and also facilitated central bank to move to informal interest rate targeting. It also lowered the volatility in the short-term money market rates. Most importantly, after the central bank became close to running out of securities as a result of open market operations mopping up Rs.1,859 billion (about US\$ 41 billion at current exchange rate) through outright net sales of dated government securities during the period 1999-2003, LAF provided the main instrument for absorbing surplus liquidity.

In the above background, RBI looked at possible alternatives to carry out its sterilisation objectives. RBI (2003) recommended several steps to improve its Liquidity Adjustment Facility (LAF), including introduction of daily repos/reverse repos under LAF for 7-day tenors in place of 1-day tenors. RBI (2004) recommended instituting sterilization bonds in the form of Market Stabilization Scheme (MSS). Making a clear choice in favour of issuing government bonds instead of central bank bills, MSS became operational from April 1, 2004. Central bank bills were not opted for because of risks of segmenting the market for risk-free bonds with central banks bills competing with gilts of corresponding maturities resulting in distortion of yield curve. Also, some risks to central bank balance sheet were perceived from issuance of bills. As such MSS bills were issued on government account and the proceeds from these are kept immobilized in a separate identifiable cash account maintained and operated by the RBI, which can be used only for

²⁹ The export credit refinance and liquidity support to PDs are the only standing facilities available today and they are now linked to repo rate. Effective April 2006, ways and means advances to centre and state governments have also be de-linked from bank rate and linked to repo rate. Only Rural Infrastructure Development Fund (RIDF) and General Line of Credit (GLC) scheme for NABARD is now linked to bank rate.

redemption and buyback of MSS securities. Initially, a ceiling of Rs. 600 billion was fixed on the outstanding amount of MSS with an understanding to revise it annually or at the point when it hits a threshold level close to the ceiling which too is fixed annually. The maximum ceiling fixed so far has been Rs. 800 billion (US\$17.8 billion) after the threshold was hit. MSS absorptions had helped bring down the LAF absorptions. However, overall liquidity surpluses continued to rise and were in excess of Rs.1000 billion in Q1 of 2004-05, before it began to unwind and decline to about half the earlier levels by November 2004. The unwinding of liquidity was largely the result of large credit offtake supported by boom in housing and personal loans led by new foreign and private sector banks, as also the resurgence of inflation which after having dropped to below 5.0 percent mark for last four years, reappeared in face of global oil price shock and even began to feed into manufacturing inflation and so reduced the banking sector's appetite for gilts.



Recent Challenges Amidst Change in Monetary Policy Stance

Amidst worries about resurgence of inflation, RBI changed its monetary policy stance and moved away from easy monetary policy to calibrated hardening, making it clear to the markets that it would prefer to provide "appropriate" rather than "adequate" liquidity. However, large capital flows continued and surplus liquidity again built up and exceeded Rs.1000 billion for most of 2005-06 till October. As absorption picked up in the economy, reflected in all round credit growth covering industrial as well retail sectors, RBI continued with gradual tightening, raising its liquidity absorbing reverse repo rate from 4.5 percent in October 2004 to 5.5 percent by January 2006. Four hikes of 25 bps along with accelerating credit growth sucked away most of the surplus marginal liquidity. Anticipating these trends, RBI had begun to unwind MSS since September 2005 when it

was at a high of about Rs.800 billion. By March 2006, Rs.500 billion were released through phased unwinding of this instrument. The central bank raised reverse repo rate and repo rates by 25 basis points again in January 2006 to 5.5 and 6.5 per cent respectively. The rate hike took a large segment of financial markets by surprise which was transiting from a surplus to a deficit mode since December 2005 India Millennium Deposits (IMDs) redemptions. As a result of system transiting from surplus to deficit mode, the 25 basis points policy rate increase resulted in 125 basis points hardening given the 100 basis point corridor. The rates could not be anchored in-between the corridor in absence of a mid-point policy rate to support large outright transactions under open market operations. The LAF, though discretionary window, became the principal source of liquidity provision by the central bank in addition to the liquidity providing forex operations. Under the circumstances LAF acted more as standing facility with access of banks and primary dealers becoming limited only by collateral holdings in the form of gilts rather than as a tool of open market operation.

Since mid-December 2005 to February 2006, markets witnessed tight liquidity conditions which were frictional rather than structural. The tightness was mainly the result of three factors. First, a bulk redemption of IMD of Rs. 320 billion (US\$7.1 billion) took place during December 27-29, 2006. The IMDs were foreign currency denominated deposits issued by India's largest commercial bank, viz., 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 years³⁰. The liability redemption in December 2006 was met by sale of USD against Indian rupee resources provided by the SBI which traditionally was a lender in overnight money markets, Second, there was a sharp increase in government cash balances maintained with the Reserve Bank, which during December 2005 and February 2006 were higher by about Rs.180 billion as compared to January-November 2005. Build up in government cash balances close to end of the fiscal year was partly the result of restrained spending behaviour of the Government of India facing fiscal rules under the Fiscal Responsibility and Budget Management (FRBM) Act, 2003 and partly the result of sub-national State Governments exhibiting a similar behaviour on account of their own commitments under similar legislations as also the debt relief being linked to prudent fiscal behaviour under the award of the 12th Finance Commission. Third, robust credit offtake sucked up substantial part of surplus liquidity with the incremental credit-deposit ratio being more than 100 per cent for two consecutive years.

The central bank faced considerable pressures from banks and other market participants to ease liquidity conditions as overnight rates in uncollateralized inter-bank segment breached the upper ceiling of the corridor set by reverse repo rates. In spite, of the central bank introducing a second LAF auction since November 28, 2005, the overnight uncollateralized rates could not be maintained within the corridor on several days during the tight liquidity phase of mid-December 2005 to February 2006. The breaching of the rates was partly the result of paucity of collateral in the gilt repo market and partly the result of segmentation of overnight markets caused by conscious policy implemented over last four years to phase out non-bank participants from uncollateralized markets by

³⁰ 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.

turning call money market into a pure-inter-bank market on consideration of risk mitigation and clearer monetary transmission. In contrast, the rates in the collateralised segment of gilt repo market stayed within the informal interest rate corridor set by the central bank. The collateralised segment includes the segment of Collateralised Borrowing and Lending Obligations (CBLO) in which transactions are in a nature of tripartite repo with guarantee from Clearing Corporation of India Limited (CCIL), which is a central counterparty. Over two thirds of the overnight money market is now collateralised. Weighted by one-leg turnovers, the overnight interest rate in collateralised and uncollateralized segments had stayed by and large within the corridor, except on few occasions in February 2006. However, since a large part of the lending in overnight money markets are largely from insurance companies, mutual funds and some non-bank financial companies, all of which have been phased out of uncollateralised segment and now lend only in collateralised market repo and CBLO markets, the interest rate pressures under tight liquidity are witnessed disproportionately in the uncollateralised inter-bank call money market. In order to partially relieve such pressures and enable deficit banks to borrow from central bank LAF windows the central bank announced in April 2006 that it would make State government securities eligible for LAF as well.

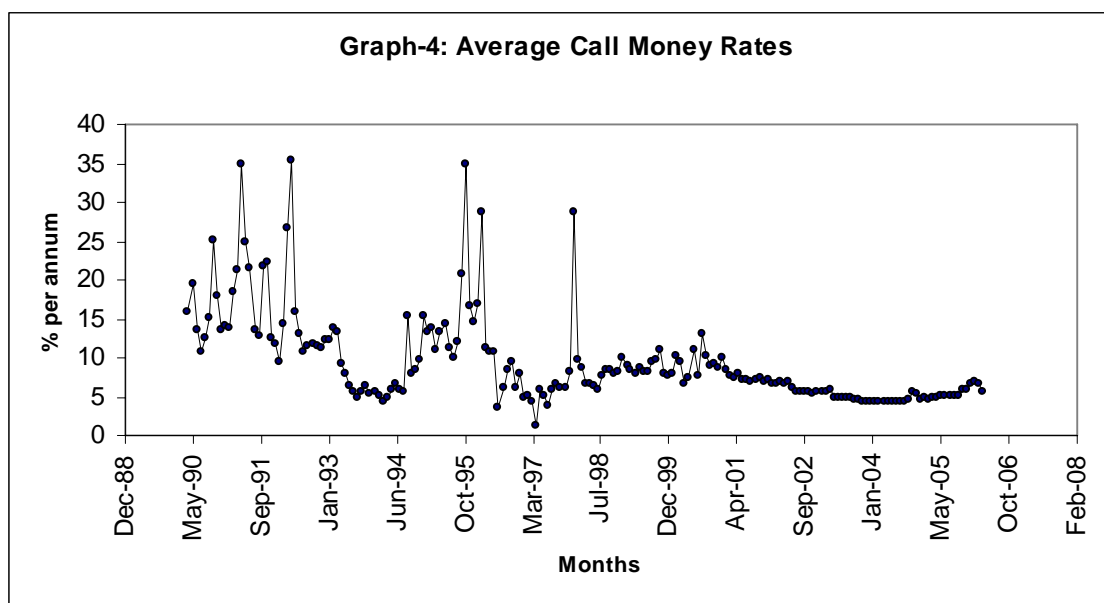
In April 2006 liquidity conditions have changed once again due largely to larger than expected government spending and hangover of past liquidity-providing central bank interventions. Government drew down its entire cash balances maintained with central bank which were in excess of Rs.600 billion sometime in March 2006, as both centre and States met their year-end expenditures. While seasonal decline in government balances is seen in April, in 2006 this decline was double its normal magnitude. Overnight interest rates declined again and with this the daily absorptions under LAF surpassed Rs.600 billion towards the end of April 2006 and the central bank decided to resume T-bills auctions under MSS which had remained suspended since November 2005 as liquidity had tightened.

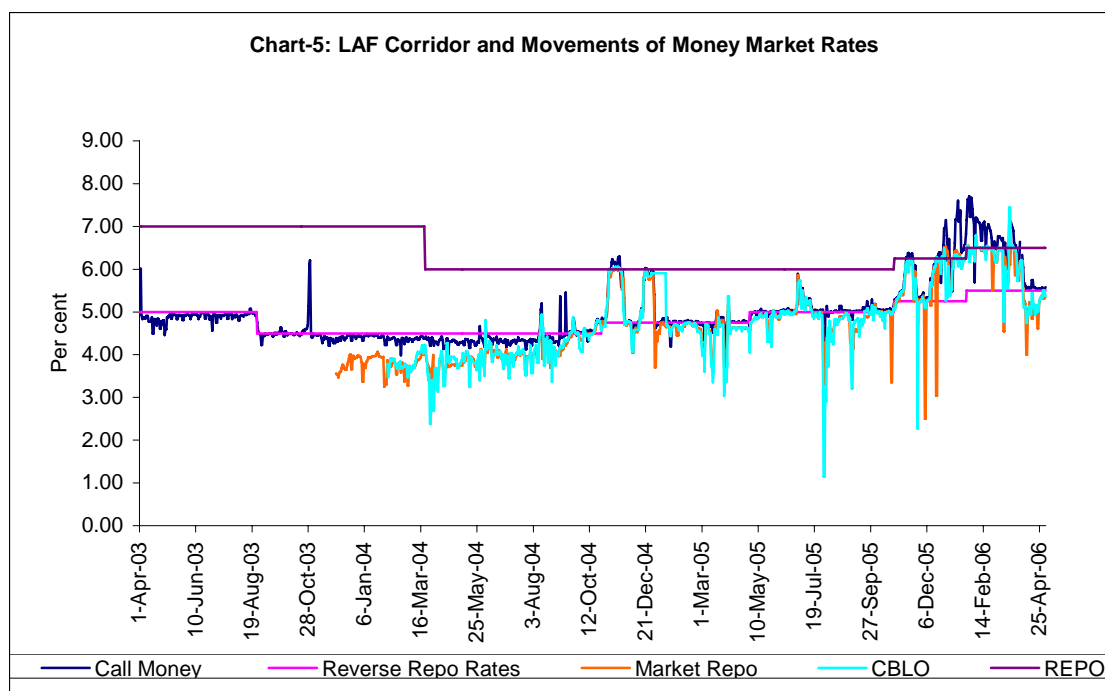
Notwithstanding the recent challenges faced in monetary operations, monetary operations in India have been reasonably successful in delivering monetary policy objectives and the short-term interest rates in uncollateralized as well as collateralised segments have by and large remained anchored to the reverse repo rates.

There are several lessons from the Indian experience.

- First, the shift to indirect instruments based on repo/ reverse repos with central bank may involve arduous institutional developments, but yield rich dividends in form of lower short-term interest rate volatility which helps central bank influence interest rates. In India, LAF has delivered volatility in short-term rates which has been distinctly lower when compared to many other emerging market countries (Saggar, 2006). That the call volatility has significantly come down after introduction of LAF can be easily seen from Graph-4. Graph-5 shows that interest rates get anchored to policy rates and while they may breach the corridors in event of enduring large surpluses or deficits, they nevertheless remain around the policy rate(s).

- Second, institutional development is important for shifting to indirect instruments. There is a whole gamut of slow but steady institutional changes which were supported by the central bank to develop indirect instruments. These include support to T-bill auctions, supporting emergence of primary dealers, supporting setting up of CCIL, implementation of Securities Settlement System, launching of Real Time Gross Settlement (RTGS) system, etc.
- Third, India continuously experimented in search of innovative instruments for monetary policy operations and its dependence on MSS was very effective. MSS model of sterilizing bond has inherent advantage of monetary-fiscal coordination which keeps markets unified and does not put undue pressure on central bank balance sheet. The instrument has been flexibly used to modulate liquidity conditions in both directions.





- Fourth, in recent period, the central bank had consciously decided to impart much greater flexibility to exchange rates and had abstained from intervening in the foreign exchange market in 2005, though interventions for monetary policy purposes of providing liquidity were undertaken during February and March 2006. The increased exchange rate flexibility has been pursued consciously to avoid the trap posed by the impossible trinity or the trilemma³¹. This helped in lowering absorptions amidst enduring surpluses.
- Lastly, when faced with large capital inflows it is best to undertake some capital account management so that macroeconomic management could sustain capital flows over a long period.

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³¹ Impossible trinity refers to the Mundell-Fleming literature which shows that it is impossible to simultaneously achieve free capital mobility, a fixed exchange rate and monetary policy independence.

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RUSSIA: MANAGING SURPLUS LIQUIDITY

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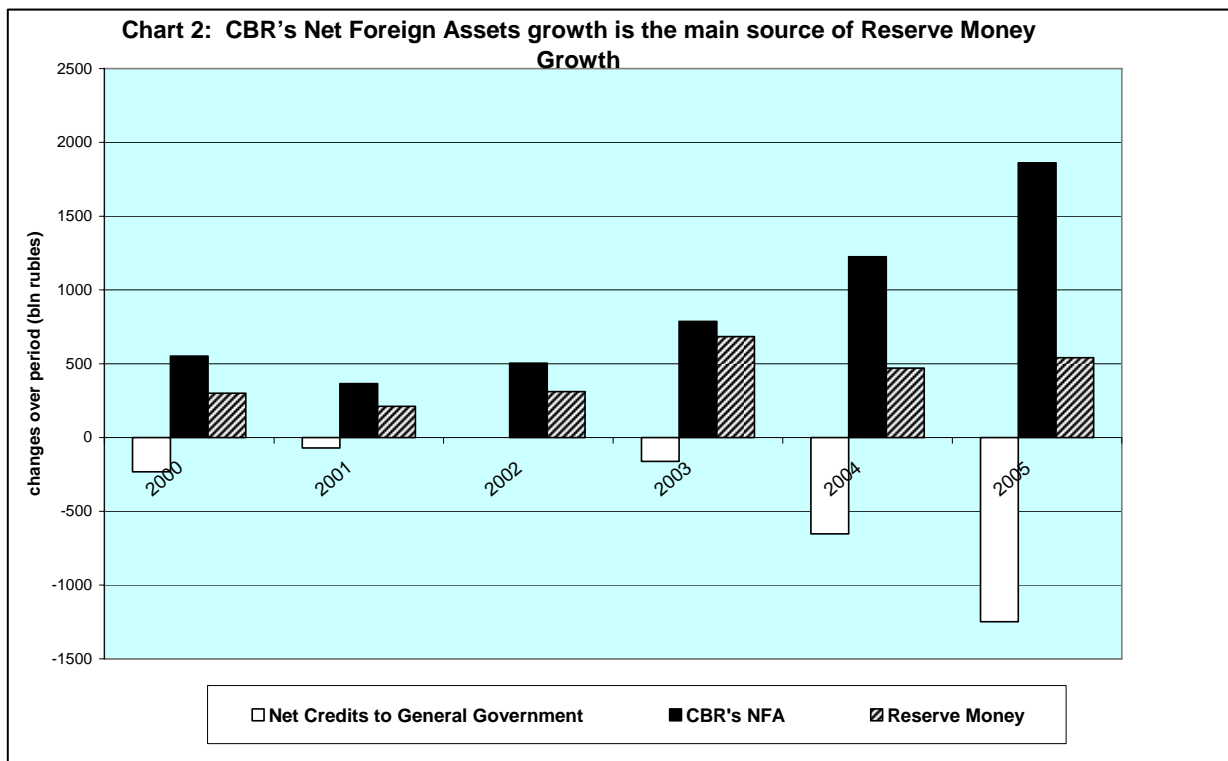
Recently the Bank of Russia monetary policy has been influenced by the increased impact of external economic factors on the Russian economy. As Russia is one of the major exporter of oil and petroleum products, considerable growth in world oil prices leads to massive inflow of foreign currency earnings from exports. Russia's current account surplus runs to \$87 billion in 2005, an increase of 80% as compared with 2000.

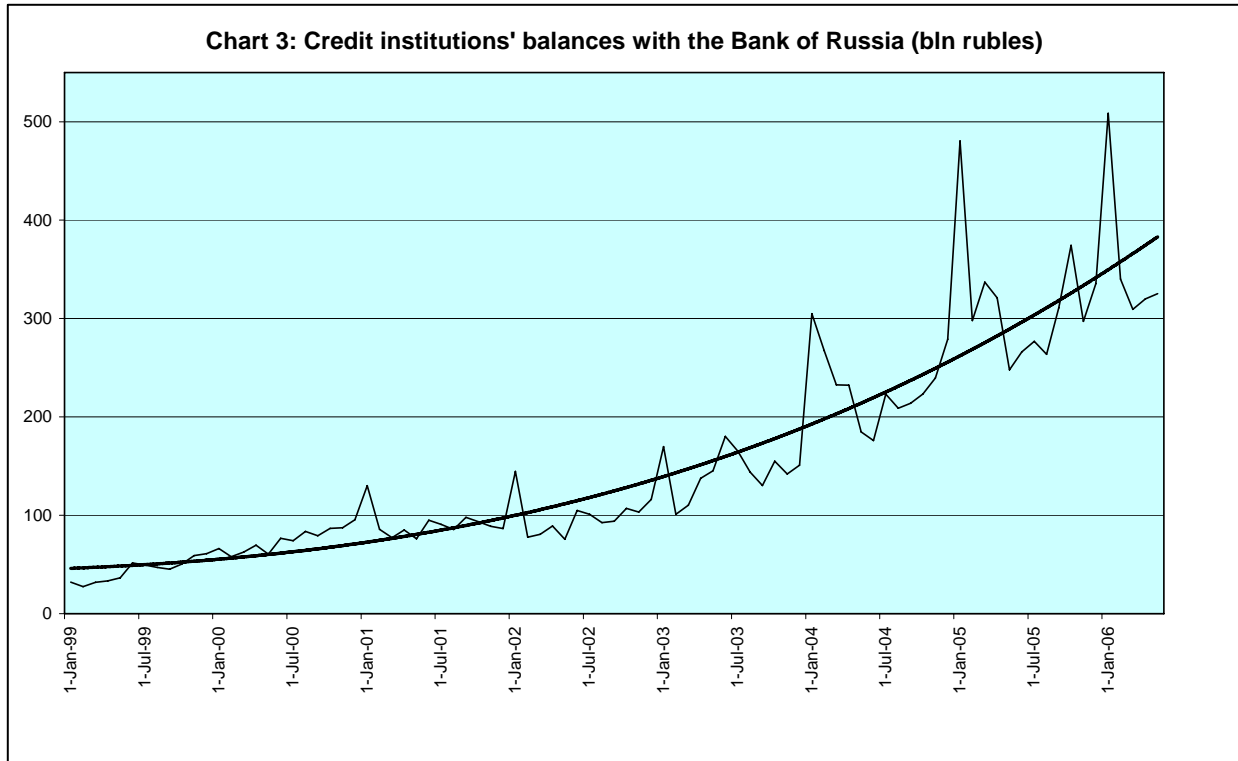
Significant growth of foreign currency supply on the domestic market creates preconditions for considerable appreciation of the national currency. To maintain economic growth, the Bank of Russia had to implement the **managed floating exchange rate regime**. As the foreign currency supply constantly exceeded demand for it, the Bank of Russia made interventions on the domestic foreign exchange market and restrained the rate of the ruble's appreciation. The ruble has stably appreciated since 2003. The Bank of Russia's purchases of significant amounts of foreign currency on the domestic market have resulted unprecedented growth in the country's international reserves (over the past six years they have increased by more than 14 times) and huge liquidity growth in the economy (chart 1).



Thus, the principal sources of surplus liquidity in the Russian economy in recent years has been the sustained favorable balance of payments' current account due to **trade**

balance surplus (chart 2) and managed floating exchange rate regime. The Bank of Russia's participation on the domestic foreign exchange market has been reflected in the CBR's balance sheet, especially in respect to significant growth of net foreign assets and the counterpart growth in liabilities to credit institutions (chart 3).





The problem of managing surplus liquidity is extremely important from the viewpoint of seeking the reduction of inflation as the principal goal of the CBR's monetary policy. The need to sterilize excess liquidity in the economy arises, above all, from the position that inflation is, in effect, a monetary phenomenon, which means that without corresponding economic growth, medium- and long-term expansion of the money supply puts an upward pressure on prices. As a rule central banks increase interest rates to constrain the amount of money in the economy and price growth.

However, the current internal and external conditions impose a limitations **on the Bank of Russia's ability to raise interest rates** for restraining the money supply growth. From the viewpoint of the effectiveness of the interest rate channel of the **transmission mechanism**, the Russian economy has not yet demonstrated an obvious correlation between the change of any CBR's interest rate and its ultimate effect on economic agents' behavior. The transmission mechanism of the Bank of Russia's monetary policy is weak. Credit and interest rate channels are still ineffective. Interest rates play a small part in having an impact on inflation, especially in comparing to the exchange rate channel. Besides, significant differences between interest rates in Russia and abroad also did not allow the Bank of Russia to play a leading role in sterilisation by raising interest rates on its instruments. The raising of interest rates in that situation could have provoked additional capital inflow, while liquidity sterilisation could have produced the opposite result.

It should also be noted that the use of such a crude liquidity absorption instrument as changes in reserve requirements also has its limitations. The main cause is that the raising

of the required reserve ratios under the regional differences in free banks' reserves concentrations and a high degree of the money market segmentation could have created liquidity problems for some small and regional banks. It should be mentioned in this context also that liquidity absorption operations involve interest payments: a significant rise in the CBR's interest rates, may on the one hand increase the cost of sterilisation for the CBR and, on the other hand, lead to further growth in banks' reserves, maintaining spiraling of this process due to the short-term nature of such operations.

Russia's Oil Stabilisation Fund

The analysis of the experience of the oil-exporting countries in regulating and using their rapidly growing incomes from exports and managing surplus liquidity in the economy shows that many of these countries have created so-called 'stabilisation funds'. Russia established its own **Stabilisation Fund** in February 2004, aiming to accumulate additional budget revenues from the high prices of exported energy commodities. As at May 1, 2006, the Stabilisation Fund accounted for 1,800 trillion rubles (about 66 bln.\$).

Box: Russia's Oil Stabilisation Fund

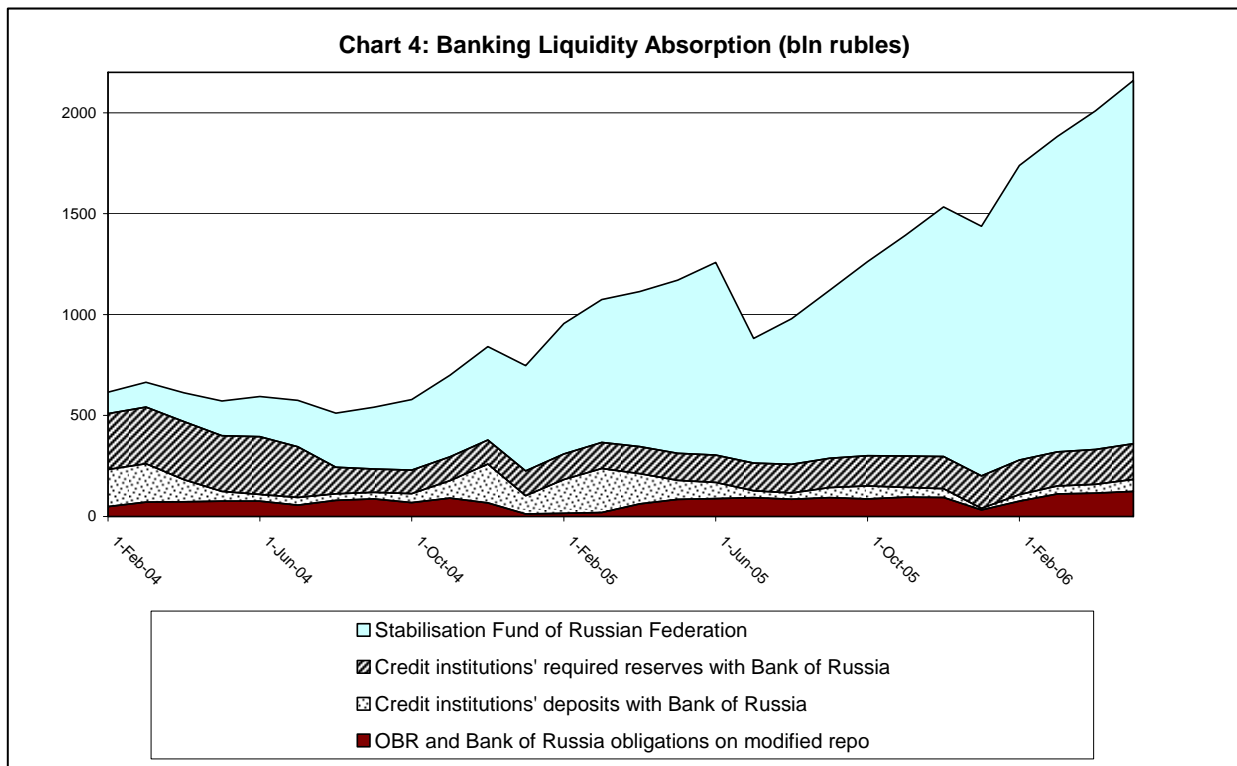
The sources of the Stabilisation Fund are follows:

- additional federal budget revenues from export duty on oil and of tax on oil extraction if the price of crude oil "Urals" is higher than the legislatively set base price;
- federal budget balances at the beginning of a financial year.

The Stabilisation Fund may be used to finance the federal budget deficit when the price of oil falls below the base price and for other purposes if the Stabilisation Fund exceeds 500 billion rubles (about \$18 billion), for example for paying off foreign debt. Domestic spending is limited by the threat of inflation growth. By now Stabilisation Fund has been carrying out a sterilization function also. The decisions to use the Stabilisation Fund are made within the framework of the federal budget law.

Volume of the Stabilisation Fund is not yet sufficient to ensure federal budget against falling oil prices. In Russia Stabilisation Fund is equal to 5.7% GDP. But: in Kuwait – around 80%, in Norway – 70%, in Oman and Azerbaijan – 20% and in Kazakhstan – 12%. As Stabilisation Fund increases there is the possibility of forming a Fund for future generations.

At present, the Stabilisation Fund is being kept on the ruble government accounts with the Bank of Russia. It is permitted to transfer it into foreign exchange assets (US dollars, euros and GB pounds) and invest in government securities of 14 states.



The reality of the past two years has shown that the **Stabilisation Fund** in its current status helps **sterilise majority of surplus liquidity** in the economy (chart 4). The Stabilisation Fund has a relatively long-term sterilizing effect on money supply, but it is a crude liquidity absorption instrument and the duration of its effect is unpredictable. When the Stabilisation Fund mechanism was established, the Bank of Russia focused its own efforts on current banking liquidity regulation in the short-term by using monetary policy instruments. However, a strong balance of payments, characterised by significant growth in foreign currency reserves, and the high level of free banks' reserves compelled the Bank of Russia to make a trade-off between the classical fine-tuning of banks' reserves and measures for reducing money supply growth (in favour of the latter).

CBR Monetary Instruments

As **liquidity absorption instruments**, the CBR uses deposit operations, issuance of CBR bonds, reverse modified repos operations and outright operations (sale of government securities from CBR's own portfolio).

The Bank of Russia implemented **deposit operations** with credit institutions on a regular basis in the second half of 1998. At present it conducts deposit operations at fixed interest rates and at interest rates set by deposit auctions. Fixed-rate deposit operations are realized daily on standard terms and deposit auctions - weekly.

The procedure for conducting **reverse modified repos operations (OMR)** with federal loan bonds (OFZ) from CBR's own portfolio was established by the Bank of Russia in 2001. It allowed the Bank of Russia to use for the purposes of monetary policy federal loan bonds that could not be used in direct operations because of their extremely long maturity periods and non-market coupon interest rates. OMR operations were a means of absorbing liquidity and complied with the needs of credit institutions for short-term instruments. It should be noted, however, that the Bank of Russia began to conduct regular operations with government securities by reverse modified repos operations and sell government securities from its own portfolio in late 2002. Before that, for a long period since 1998, the Bank of Russia did not sell government securities from its own portfolio or conduct reverse modified repos operations (OMR) because it had no bond issues with marketable parameters in its portfolio. In the latter half of 2004 after the Bank of Russia started to place its own bonds (OBR), it began gradually to replace OMR by operations with its own bonds and in 2005 the Bank of Russia did not conduct OMR.

In 2004 the CBR broadened the scope of its operations for absorbing free reserves of the credit institutions by issuing its own securities. Bank of Russia bonds (OBR) were issued for the first time in the middle of 2001. Their yield was lower than that the yield of the short-term government securities (GKO) or federal loan bonds (OFZ). In 2002 and 2003, the Bank of Russia didn't conduct operations with its own bonds, which were resumed in September 2004. Since the March 2005, the Bank of Russia puts into practice bilateral operations with OBR daily for the purpose of giving market participants the opportunity to invest their temporarily free funds or sell bonds to the Bank of Russia.

Reserve requirements also play a positive role in absorbing banking liquidity. However, despite the necessity to limit money supply growth, the Bank of Russia in 2004 (when the banking sector demonstrated the signs of its destabilization) decided to reduce the required reserve ratios to prevent a systemic banking crisis. In 2004, the required reserve ratio for funds attracted from corporate entities in rubles and funds attracted from corporate entities and private individuals in foreign currency was reduced from 10% to 3.5% and the required reserve ratio for funds attracted from private individuals in rubles was reduced from 7% to 3.5%. Some changes were made in the required reserve base on August 1, 2004 (in particular, credit institutions' obligations to non-resident banks, for which the required reserve ratio was set at 2%, were included in it). At the same time, the CBR introduced a procedure for averaging required reserves. This procedure means that banks must keep 20% of required reserves in their correspondent balances with the Bank of Russia. This mechanism actively used by credit institutions.

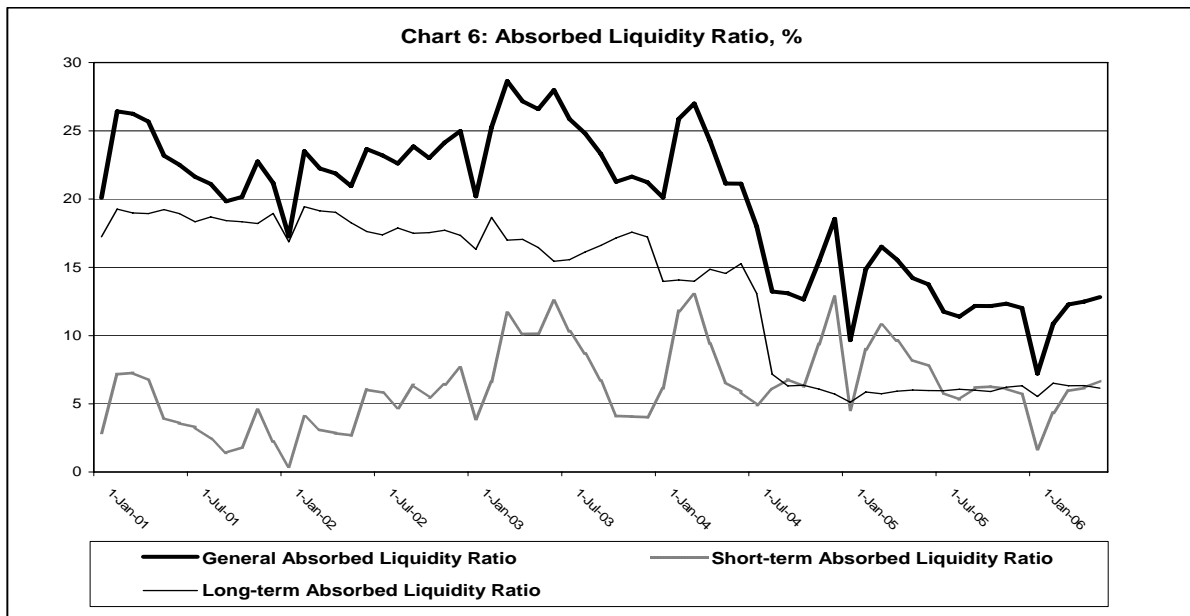
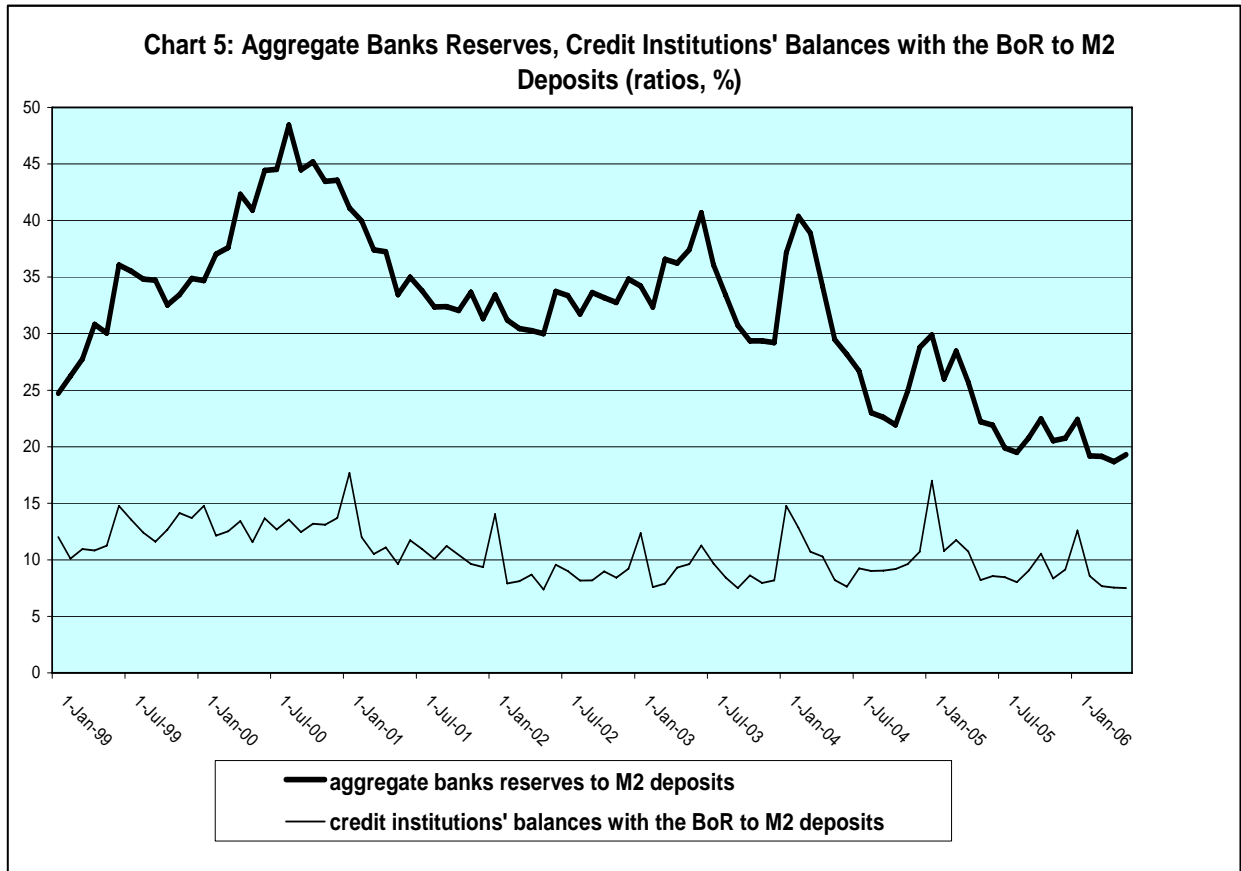
Liquidity Absorption Operations

Kind of Facilities	Type of operation	Maturity, Interest Rate (as of April 2006)
Standing Facilities	CBR's deposit operations by fixed-term rate	tom+next, spot+next, demand deposits (1,5%), 1 week (2%)
Open Market Operations	Deposits auctions	4 weeks (aprox. 2,5%), 3 months (aprox. 4,8%)
	CBR's Bonds	to 6 months (aprox. 5,2%)
	Reverse REPOs (auctions)	28 days, over 6 months (until 2005)
	Outright Operations	-

Some changes in the level of free bank reserves may reflect the ratios of aggregate bank reserves¹ and credit institutions balances with BoR to M2 deposits (chart 5) and the dynamics of the so-called absorbed liquidity ratios² (chart 6).

¹ **Aggregate banks' reserves** include cash in vaults of credit institutions, required reserves, correspondent account balances of credit institutions with the Bank of Russia, banks balances on Bank of Russia deposit facility, Bank of Russia obligation to buy back securities, Bank of Russia bonds (OBRs) held by banks.

² The **long-term** absorbed liquidity ratio is accounted as the ratio of the required reserves to the broad monetary base. The **short-term** absorbed liquidity ratio is calculated as the ratio of banks' deposits with the Bank of Russia and OBR (OMR) to the broad monetary base.



Summary

The increased role of the federal budget as a channel for sterilising money supply led to the reducing of credit institutions' account balances with the Bank of Russia. At the same time, the business activity brightening caused the growth of the Russian real sector's demand for credit and stimulated the use of the instruments for providing liquidity in the periods when demand for it grew. The demand for the refinancing instruments rose particularly in 2004 and 2005.

The main CBR instruments to provide liquidity are intraday, overnight, Lombard loans and repo operations. In addition, the Bank of Russia uses currency swap transactions whenever necessary and conducts outright operations.

Refinance Operations

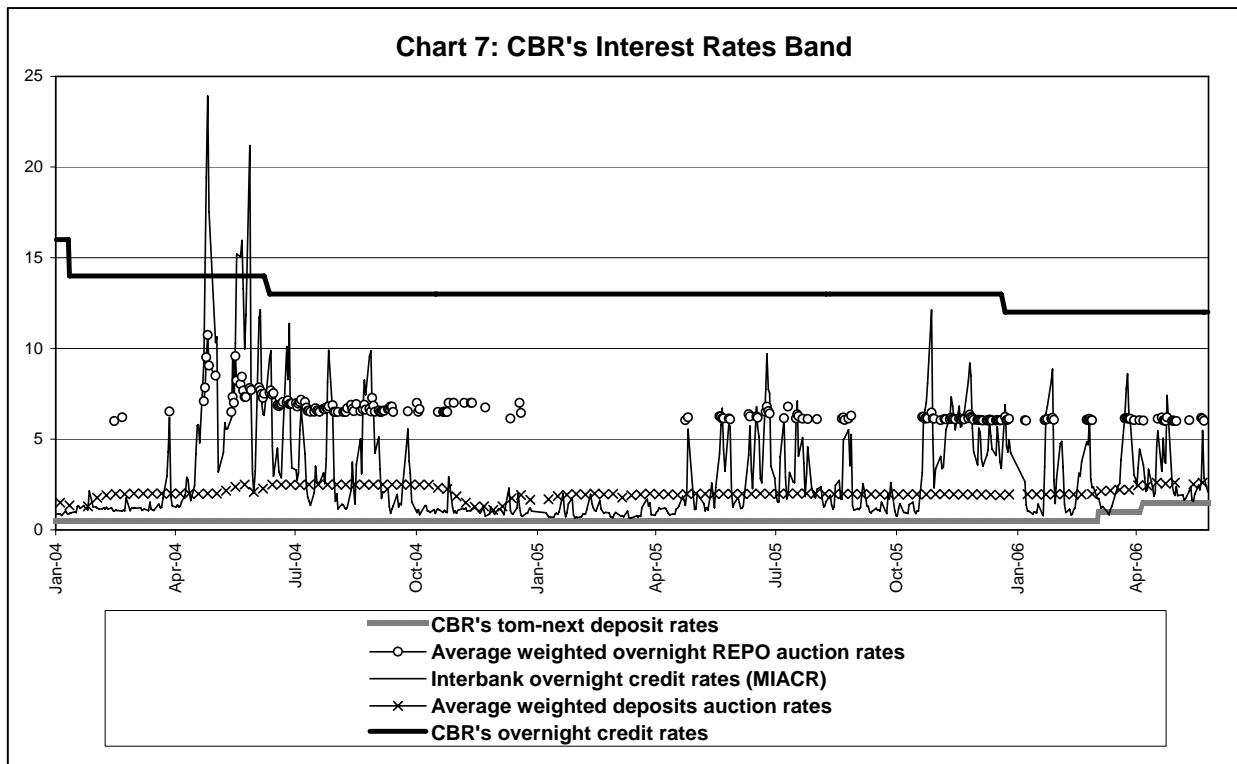
Kind of Facilities	Type of operation	Maturity, Interest Rate (as of April 2006)
Standing Facilities	Credits	intra-day (no interest), overnight (12%)
	Lombard Credits	7 days (12%)
	Currency Swap Operations	overnight (12%)
Open Market Operations	REPO's (auction)	1-7 days (aprox. 6,2%), 1 week
	Lombard Credits auctions	2 weeks (7,1%)
	Outright Operations	-

The Bank of Russia began to implement repo operations regularly in the second half of 2002 to provide liquidity to credit institutions. This instrument has been increasingly used in recent years. In 2005 repo operations became the major source of liquidity for credit institutions provided by the Bank of Russia in the periods of increased demand for it.

The Bank of Russia makes some efforts to raise the importance of interest rates as an instrument of its monetary policy. But under the current economic conditions the interest rates on the Bank of Russia operations play rather the role of a limiter than a regulator of the market interest rate (chart 7). In 2000-2005 CBR's interest rate policy aimed to maintain the interest rate band for its operations. The interest rate on tom-next deposits (the largest part of total credit institution funds taken on deposit) establishes the floor of the band (it equal now 1.5%). The Bank of Russia overnight credit rate and currency swap rate places the ceiling of the band (it equal now 12%).

Alongside with the reduction of yields on the interbank credit market, government securities market and inflation, the Bank of Russia has reduced interest rates on its own

operations and the refinance rate. The overnight interest rate, which equals the refinance rate, decreased from 50% at the beginning of 2000 to 12% at the end of 2005. Interest rate on “tom-next” deposits fell from 4.5% in 2002 to 1.5% in 2005. The short-term money market interest rates were mostly within the Bank of Russia interest rate band. But there is no significant correlation between long-term interest rates of Government securities (by now the Government of Russia has abandoned the issue of bonds with short maturities like former GKO) and short-term interest rates of money market, including CBR’s interest rates.



Now the Bank of Russia has to implement “combined strategy” of monetary policy. On the one hand, the CBR’s task is the monetary policy elaboration being based on the principles of monetary targeting and using elements of inflation targeting. On the other hand, implementing exchange rate policy, the Bank of Russia takes into account influence of exchange rate dynamics on the Russian economy. The ruble appreciation restrains growth in domestic prices. At the same by maintaining smooth exchange rate dynamics, the Bank of Russia not only prevents economic shocks and creates sustained conditions for production, but also reduces risks on the financial markets, thereby maintaining financial stability.

But the Bank of Russia recognizes that “a door must be either shut or open”. As the Bank of Russia will intend to use in the future inflation targeting regime it has to minimize its presence on the domestic foreign exchange market and switch to a free floating exchange rate regime when a proper conditions will create possibilities for a transition to this strategy.

Over the past five years, inflation (for consumer price index) has been reduced from 20.2% in 2000 to 10.9% in 2005. By 2008, the Bank of Russia and the Russian Government intend to reduce inflation to 4-5.5%, a level that matches the main parameters of Russia's social and economic development scenarios for this period. One of the main reasons for the high rate of inflation in recent years have been the significant increase in prices for marketable services rendered to household administered at the regional and municipal levels and petrol price dynamics at the consumer market amid high world energy prices.

Now in Russia the only way to achieve the inflation target is to take concerted action between the Bank of Russia and the Russian Government in implementing monetary, exchange rate, fiscal, tariff, structural and social policies.

TURKEY: CAUSES AND MANAGMENT OF SURPLUS LIQUIDITY

Sule Senel Tabak, Türkiye Cumhuriyet Merkez Bankası

Introduction

A high level of liquidity surplus, which the Central Bank of Turkey (CBT) has been sterilizing through open market operations, can characterize the post-2001 crisis period. In the period prior to the November 2000 - February 2001 crisis, the overnight (O/N) borrowing needs of the public banks and the banks that were transferred to the Saving and Deposit Insurance Fund (SDIF) were extensive, causing sharp movements in interest rates and distorting the money markets. After the crisis, in 2001 a comprehensive Banking Sector Restructuring and Rehabilitation Program was initiated.

As a key first step of this program, these banks were heavily funded to meet their O/N borrowing needs within the framework of Treasury-Central Bank coordination. In this context, to cover the duty losses³² & capital requirements of the state-owned and SDIF banks, the Treasury issued CPI indexed bonds, with 5-9 years maturity, amounted to YTL 14 billion to these related banks; and the CBT purchased these securities to provide liquidity. This operation solved the structural liquidity needs of the above-mentioned banks and increased the amount of available funds in the market. As a by-product the conditions of the excess liquidity started to emerge. Initially, this excess liquidity was expected to be temporary and decrease as demand for base money increased or Treasury redeemed the bonds in the Central Bank portfolio. However, as a result of the prudent monetary and fiscal policies that have been implemented in the post crisis period, the foreign exchange inflows to Turkey became stronger and CBT has had to mop up this unforeseen FX inflow, purchasing the foreign exchange and so generating more domestic currency liquidity. As a consequence, excess liquidity conditions turned into a structural liquidity surplus and the CBT incurred losses³³ in 2003, 2004 and 2005 and this trend seems to be continued in 2006. The losses of the CBT are associated with increased interest-bearing domestic liabilities as open market operations were used to sterilize the increased liquidity in the market.

Developments in the main macroeconomic indicators

After years of political and economic instability, Turkey has undergone a major transformation process since 2001. Inflation came down to 8% from a high 80% and the

³² Exceptional treatment of state banks in terms of assigning certain non-bank activities/duties to them, such as extending subsidies to agricultural sector, thereby creating losses which was to be financed from the central governments budget. In the past, financial conditions of state banks, which provided significant resources for accomplishment of public duties, have been deteriorated due to duty losses. Legislation to eliminate all existing provisions authorizing creation of duty losses in the state banks was adopted in 2001 within the context of restructuring and rehabilitation program of the state banks.

³³ 2003, 2004 and 2005 loss: YTL 1,550 million, 509 million and 131 million.

CBT has adopted formal inflation targeting strategy as of January 2006. Economic activity rebounded strongly and the economy grew at an impressive pace in the past 3 years despite high oil prices. Improved economic indicators (Table 1), political stability, new opportunities in sectors such as information, energy and communication technologies together with the Brussels' decision to start accession talks with Turkey in October 2005 made Turkey a major destination for global funds and capital, looking for high-yielding markets. Foreign companies are increasingly interested in the large and fast-growing Turkish market, and especially local banks have indeed been the targets of M&A deals.

Table 1: 2001 – 2006 Main Economic Indicators (Realizations, Program for 2006)

	2001	2002	2003	2004	2005	2006-Prog.
CPI (%)	68.0	29.7	18.4	9.3	7.7	5.0
GNP (%)	-9.5	7.9	5.9	9.9	7.6	5
Primary Surp. / GNP (%)	6.8	4.3	5.2	6.1	7.4	6.5
Public Sector Borrowing Requirement / GNP (%)	16.3	12.6	9.3	4.7	0.9 (*)	-0.7
Net Debt Stock / GNP (%)	90.5	78.5	70.4	63.5	55.8	56.5
CBT interest rates (end year) (%)	59	44	26	18	13.5	
FX Reserves of the CBT (Billion USD)	18.7	26.7	33.6	36.0	50.5	65.0

(*) : Projection

Sources: CBT, Treasury, Ministry of Finance

Thanks to positive developments in the economy, mentioned above, reverse currency substitution started in 2002 and the lira has been on the appreciation trend for the last 3 years. One of the main contributors to the appreciation of the YTL has been Turkish residents' conversion of USD & Euro savings into YTL, which has started with the implementation of a stabilization program in 2002. Turkish residents' total deposits amounted to YTL 133.8 billion as of end 2002, of which 57% was denominated in foreign currencies. By the end of 2005, the foreign currency share had slipped to 36%.

Main determinants of liquidity

The main factors affecting liquidity in the 2002-2006 period were:

- CBT-Treasury transactions;
- Treasury's net FX income including external debt management;
- CBT interest payments for excess liquidity & required reserves;
- Increase in money demand; and
- FX transactions of CBT.

The rise in base money, coupon and principal redemption by the Treasury to the CBT, the increases in Treasury accounts and net foreign currency debt reimbursement by the Treasury via borrowing YTL have decreasing effects on the liquidity. On the other hand, purchasing of foreign currency by the CBT and interest payments for reserve requirements have increasing effect on the liquidity.

III. A. CBT-Treasury or Semi-Treasury Transactions

These transactions can be classified into two categories. First one is the CBT purchase of government securities from SDIF and Public Bank. This operation can also be classified as CBT-Treasury linked operation.

The second one is the IMF credits extended to the Treasury through CBT accounts. Until November 2001, all IMF credits were extended to the CBT³⁴ in form of standby arrangement and in the second stage these credits were transferred to Treasury in the form of domestic FX-linked credits. When the credits are extended, the liquidity in the market increases and on due dates with the repayments of Treasury the excess liquidity decreases. However, in 2001 the procedure changed and IMF extended additional external financing³⁵ of USD 9.6 billion to Treasury for budgetary purposes in the form of supplemental reserve facility with standby agreement and CBT acted as an intermediary in this purchase on-lending credit facility³⁶ due to the regulatory structure of the IMF. Since 2002, the Treasury has been a net debt payer to the CBT and this has been one of the main elements that controls the increase in excess liquidity in the market.

³⁴ IMF credits are extended to countries if only they have balance of payment needs not for specific projects.

³⁵ The aim of this credit is providing financial assistance to members experiencing exceptional balance of payments difficulties due to short-term financing needs resulting from a sudden and disruptive loss of market confidence.

³⁶ Large-scale IMF disbursements started at the end of 2000, and the pace of IMF lending picked up in 2001. Turkey's outstanding purchases from the IMF via Stand-by arrangements are in downward trend since 2003 and as of February 28, 2006 the total is SDR 9.1 billion. On obligation basis, projected payments of Turkey to Fund will continue in the forthcoming 5 years and be completed in 2010.

III.B. CBT Net FX Purchases

On the exchange rate front, Turkey has been implementing a floating exchange rate regime since February 2001. The CBT may only directly intervene in the markets with a view to prevent excessive volatility in exchange rates that might occur, in either direction. On the other hand, taking advantage of the improved credibility of the current program, which has resulted in increased fx supply, the CBT aims to build up its foreign exchange reserves through fx buying auctions consistent with the floating exchange rate regime, with a predetermined calendar. For the period of January 2002 – March 2006, CBT injected YTL 63.3 billion to the banking system via net fx buying auctions and interventions. The total international reserves of the CBT rose by 208% from USD 18.9 billion in January 2002 to USD 58.3 billion as of end March 2006.

III.C. Treasury's Net Domestic and External FX Borrowing

Since the CBT is the fiscal agent of the Treasury and all foreign currency transactions are settled in CBT accounts, the liquidity conditions change depending on the Treasury's fx borrowing strategy both domestically and externally. If the Treasury is net borrower / payer in foreign exchange, the excess liquidity increases / decreases. The Treasury was in a net foreign exchange borrower position in 2002, but it has been in the net payer position since then - especially on the external side. The Treasury has been trying to reduce the exchange rate exposure by reducing both domestic fx borrowing and external fx borrowing since 2003. This strategy helps CBT as the Treasury finances net FX payments through YTL borrowing or increasing the primary surplus, which is in YTL.

III.D. Privatization Revenues in FX

Turkey has been initiating a variety of reform measures aimed at solving the main problems of the economy. Within this framework, privatization efforts of the state operated enterprises gained importance. Actually, privatization implementations started in 1984 but they have gained momentum since 2004. Total revenue generated from entities within the privatization program between 1986-2004 has amounted to USD 9.5 billion, USD 8.2 billion in 2005 and USD 7.3 billion as of March 2006. But the proceeds from these privatizations concentrated in 2006. The government transferred the foreign exchange proceeds to the Treasury accounts with the CBT and these funds are sold to CBT and used for domestic payments by the Treasury. As a natural consequence of these transactions, the fx income from these privatizations started to be a source of excess YTL liquidity.

III.E. Interest Payments of the CBT for Excess Liquidity and Required Reserves

With regard to the continued favorable economic trend in economic indicators, the management of the CBT decided to cut its main policy rates and they were lowered in several steps from 80% at the beginning of the 2001 to the current rate of 13.25% as of

end April 2006. This resulted in a substantial decrease in the interest payments of the CBT.

Table 2: Interest Payments of the CBT for Open Market Operations and for YTL Required Reserves (Million YTL).

YEAR	2001	2002	2003	2004	2005
OMO	2910	3883	3227	1298	634
RR		725	890	757	821
TOTAL	2910	4608	4117	2055	1455

Required reserves are also another important monetary policy tool in Turkey. Banks are obliged to maintain required reserves at the CBT for their liabilities: ratios for these reserves are currently 6 % for YTL liabilities and 11 % for foreign currency liabilities. With the aim of decreasing the financial intermediation costs of the banking system, YTL and fx required reserves have been remunerated starting from August 2001 and May 2002 respectively. The rate applied to YTL required reserves was 40 % in 2001, falling to 10.25 % in May 2005. The rate applied to fx required reserves was 0.84% for USD and 1.58 % for EURO in May 2002 and 1.4 % for USD and 0.96 % for EURO in May 2005. YTL required reserves have been maintained on average over a maintenance period of 2 weeks since the end of 2005. Prior to that, half of the YTL required reserves were kept on average over a maintenance period of 2 weeks and the other half were held in blocked accounts. As an EU candidate country, the policy of harmonization of financial markets has vital importance for Turkey. Therefore a number of changes have taken place in this area. One of the major changes in this area is the changing of the remuneration methodology. In this context, to be effective from January 2006, the YTL required reserves have been started to be remunerated at 75% of the O/N borrowing interest rate of the CBT - is currently 13.5 % - instead of the interest rate applied by banks on YTL deposits. The remuneration rates for YTL required reserves are currently 10.12 %. The interest payments of the CBT for required reserves increased by YTL 200 million from 2002 to 2005. Both YTL and foreign exchange required reserves are remunerated, but only the interest payment on the former increases the YTL liquidity. All in all, sterilization cost of excess liquidity together with the remuneration cost of YTL required reserves has amplified the level of liquidity further.

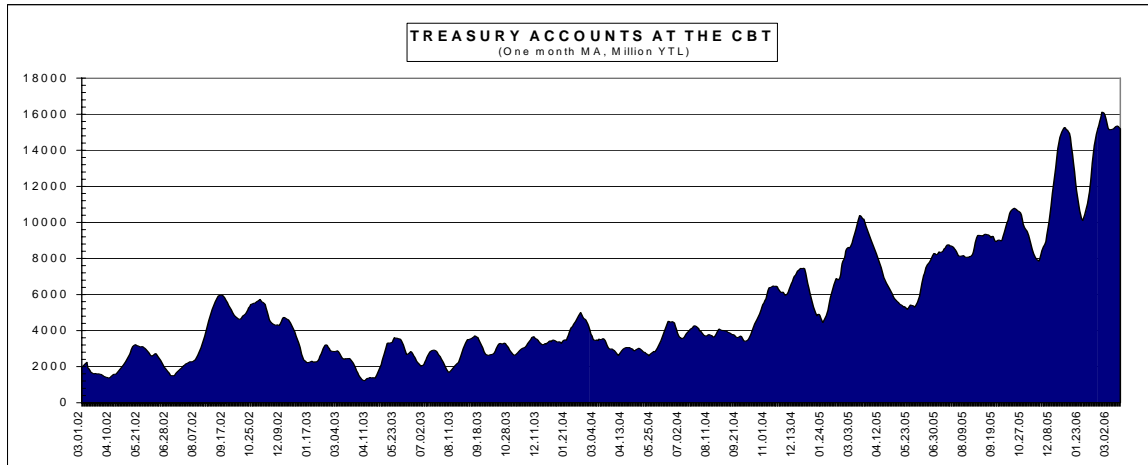
III.F. Base Money Developments

One of the most important factors that has reduced the level of excess liquidity during 2002-2006 period is the increased demand for domestic currency, which have resulted from the confidence environment, economic & financial stability and financial deepening. In real terms base money increased by 74 % in 2002, 56 % in 2003, 47 % in 2004 and 63 % in 2005.

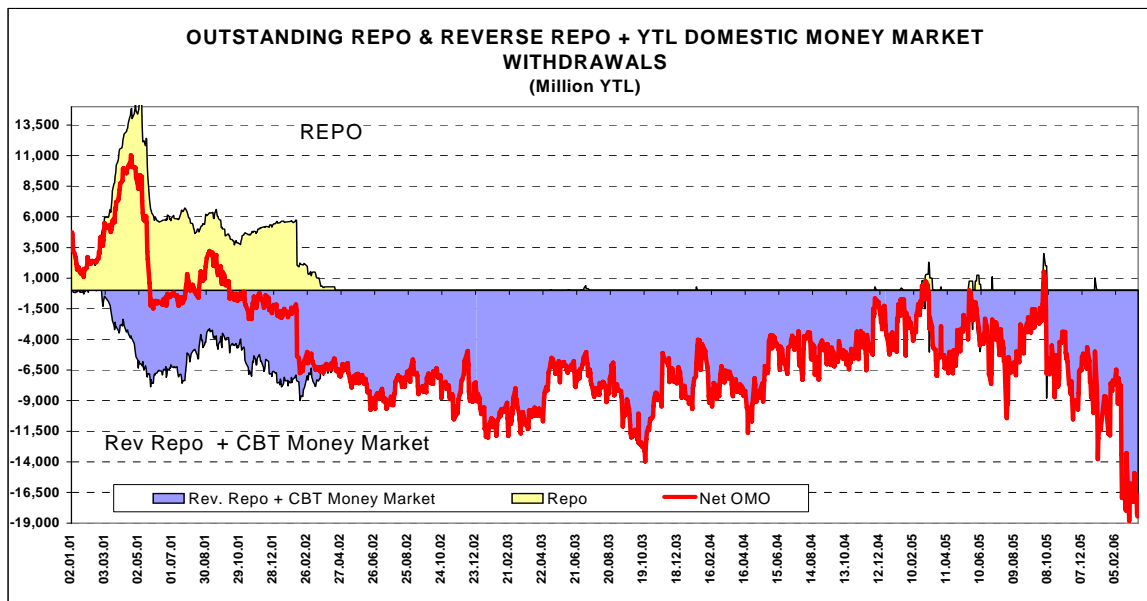
III.G. Changes in the Treasury's Cash Account at the CBT

Structural liquidity surplus conditions in Turkey necessitated much stronger Treasury-Central Bank coordination. In order to support CBT in management of the liquidity surplus, the Treasury increased its balances within the central bank³⁷, starting from 2004 and especially in the 2005 – 2006 period.

Graph 1: Treasury accounts at the CBT, million YTL.



Graph 2: Outstanding liquidity withdrawals by OMO, million YTL



Graph 1&2, which are on monthly average Treasury accounts at the CBT and on outstanding OMO withdrawals, clearly show that the large build up of the Treasury's cash deposits at the CBT contributed significantly to the tightening of the liquidity. Otherwise the excess liquidity would have reached very high levels. The importance of this coordination need increases as the privatization proceeds accelerates in 2006.

Table 3: THE SOURCES AND THE AMOUNTS OF THE EXCESS LIQUIDITY (Billion YTL)

	2002	2003	2004	2005	2006 (End March)
TOTAL OF THE LIQUIDITY INCREASING COMPONENTS	5.8	18.9	9.7	31.0	10.9
CBT Interest Payments for YTL Req. Reserves and OMO	4.6	4.1	2.1	1.5	0.7
CBT Net FX Purchases from the Market	1.2	14.8	7.6	29.5	10.2
TOTAL OF THE LIQUIDITY DECREASING COMPONENTS	-0.2	-18.1	-15.9	-31.7	-1.4
Treasury Payments to CBT	-5.3	-5.6	-6.9	-5.4	0.0
Treasury Net FX Borrowing and Privatization Revenue	8.9	-6.9	-3.2	-6.1	0.7
Change at Base Money (end year)	-2.6	-4.4	-5.3	-12.3	-0.1
Changes at the CBT accounts of Treasury (end year)	-1.2	-1.2	-0.5	-7.9	-2.0
OTHER ITEMS AND ERRORS (*)	2.7	-2.1	1.5	2.1	0.0
NET EFFECT	8.3	-1.3	-4.7	1.3	9.6
NET CHANGE IN EXCESS LIQUIDITY	8.3	-1.3	-4.7	1.3	9.6
EXCESS LIQUIDITY IN THE MARKET BEFORE CBT OPERATIONS	9.6	8.3	3.6	4.9	14.6
Yearly Average Exchange Rate (USD/YTL)	1.51	1.49	1.42	1.34	1.33

(*): This number represents the difference which comes from the calculation methods (yearly average exchange rate is used in the calculations, etc.,) and other items.

Monetary policy & instruments

Besides reserve requirements, CBT uses market-based monetary policy instruments, which are standard tools for open market operations. These are repurchase, reverse repurchase, direct purchase & sale of government bonds, central bank deposit facility, central bank lending facility and issuance of central bank bills.

Turkey has been implementing full-fledged inflation targeting since the beginning of the 2006, but before this period it implemented an implicit inflation-targeting regime between 2002-2004 and announced the year 2005 as a transition year to adopt a full-fledged inflation targeting. During 2005, the Monetary Policy Committee (MPC) was in an advisory position while the Governor took the final interest rate decisions. However, starting from 2006, with the official launching of the inflation targeting regime interest rate decisions are taken by the MPC.

³⁷ According to the CBT Law, the CBT is the treasurer of the Government. In this context, funds of the Treasury must be deposited with the CBT where the Bank is present or with its correspondent banks where it is not present and the CBT does not remunerate these balances.

Starting from 2002 the monetary policy strategy of the CBT can be defined, as an inflation-targeting regime and short-term interest rates are set by the CBT in view of future movements of inflation. In this context, the main policy tool of the CBT is short-term interest rates in the YTL Domestic Money Market within CBT and the rates in the Istanbul Stock Exchange (ISE) Repo and Reverse Repo Market. For that purpose, the aim of using open market operations is to keep interest rates consistent with the inflation targets. Therefore, keeping the volatility in short-term interest rates within a narrow band has vital importance.

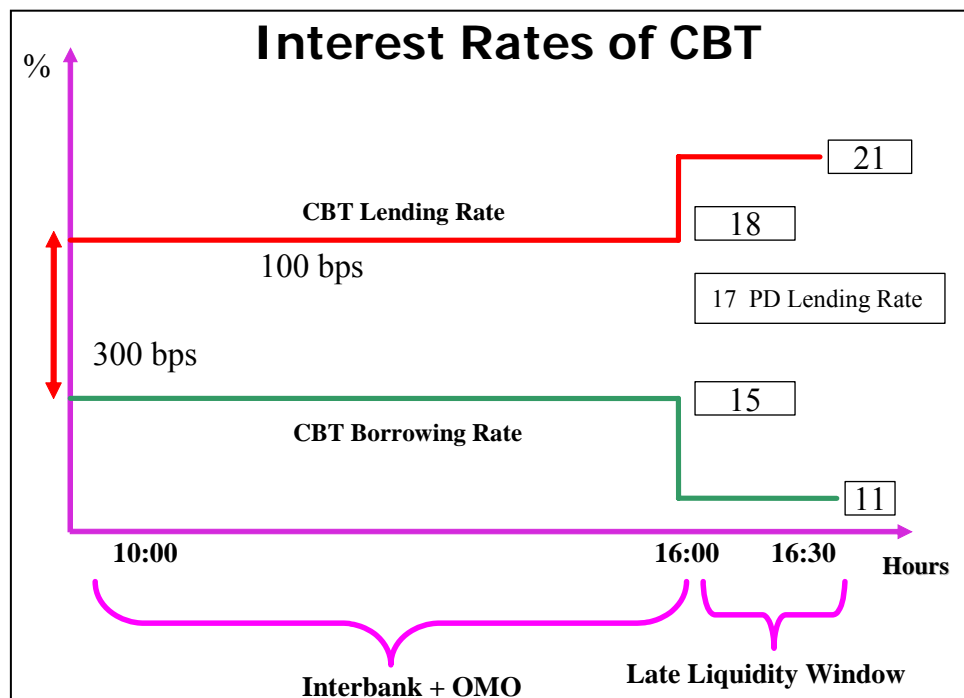
The CBT regularly announces daily lending and borrowing interest rates, which are applied by the CBT at the ISE Repo/Reverse Repo Market and at the YTL Domestic Money Market. Within this framework, the banks are able to lend to or borrow from the CBT at the YTL Domestic Money Market between 10:00-16:00 and at the ISE Repo-Reverse Repo Market between 10:00-14:00 hours. Since these rates are in line with the inflation target, short-term interest rates are formed with the inflation target.

As there has been too much liquidity surplus in the markets since 2001 and the CBT announces daily borrowing rate, which is valid in both ISE Repo/Reverse Repo Market and YTL Domestic Money Market within the CBT, O/N market interest rates constantly realize at this borrowing rate of the CBT and these rates then become the indicator for money markets. By changing this rate, the CBT influences short-term interest rates on the secondary markets and thus, market rates form in line with the CBT rates. The fine-tuning operations are provided for both repos and reverse repos and can be conducted in non-regular manner for standard tenors.

Because of the above-mentioned liquidity surplus in the markets, CBT has made sterilization heavily and has withdrawn the all-excess liquidity since 2001. The instruments that the CBT uses to drain the surplus reserves from the market can be classified as market-based. These are mainly regular liquidity absorbing reverse repo transactions carried out within the framework of open market operations at the ISE Repo/Reverse Repo Market and deposit operations at the YTL Domestic Money Market within the CBT in where banks have the option of depositing their excess liquidity for O/N maturity at a rate not exceeding the reverse repo rate.

Two types of standing facilities supplement open market operations are late liquidity window and intra-day loan facilities. The CBT provides unlimited liquidity lending/borrowing facility to the banks between 16:00-16:30 from the Late Liquidity Window and limited liquidity to the banks between 09:00-15:00 from the Intraday Liquidity Facility, both of which are against collateral.

Starting from the year 2002, the CBT also used supplementary operations to withdraw liquidity and introduced 2 and 4-week competitive interest rate auctions for the acceptance of deposits from the commercial banks. However, considering the relatively low level of Turkish lira liquidity at the markets compared to previous two years, the CBT decided to suspend these auctions in October 2004.



Since excess liquidity conditions are expected to continue in the foreseen future, liquidity management strategy of the CBT in 2006 is not going to be different from the above-mentioned structure. But, if the liquidity conditions in the markets turn into negative in the future the CBT will conduct its liquidity management operations through one-week repo auctions. In this context, the CBT will announce the amount of repo auction for that day on Reuter's screens at 10:00 and interest rates are assumed to realize one point above the daily borrowing rate of the CBT in the YTL Domestic Money Market and CBT will target the midpoint between the borrowing rate and the repo rate for primary dealers. In case of emerging of an unforeseen liquidity shortage at the markets, the CBT will also announce intraday repo auction, in addition to the regular ones.

If the liquidity conditions in the markets turn into a permanent liquidity shortage the benchmark short-term interest rate will be the repo auction interest rate, which is now the daily borrowing rate of the CBT in the YTL Domestic Money Market and at this situation, the CBT will terminate its transactions at the ISE Repo-Reverse Repo Market with a pre-announcement.

ANNEX: Monetary Operations - Managing Surplus Liquidity
by Mrs Samia Torky, Central Bank of Egypt

Introduction

Central banks in emerging market economies and developing countries followed the trend initiated by the industrial countries in the 1970s, to move towards reliance on money market operations for the implementation of monetary policy. This move was the counterpart in the monetary area to the trend towards enhancing the role of price signals in the economy. The money market operations could be operated to inject liquidity to the market or absorb liquidity from the market. Theoretically it doesn't differ in conducting monetary policy to inject or absorb liquidity, but in practice the effectiveness of money market operations is most likely to be somewhat limited.

This paper sheds light on monetary policy targets, the mechanism to achieve the ultimate target. The paper focuses on the operational framework, effective liquidity management, forecasting liquidity, instruments to be used and the role of each instrument.

A certain amount of detail is given to structural liquidity surplus, reasons of surplus, common features for central bank's balance sheet in case of surplus.

Finally, it suggests some possible solutions to deal with structural surplus, and areas for development to help in operational efficiency.

Monetary Policy Targets

The formulation of monetary policy: to design a monetary policy framework, central banks have to define the final target for monetary policy, intermediate target if it exists, and operational targets.

- ♦ The final target is an economic variable which the central bank eventually aims at, and is often enshrined in its statutes. Price stability is the final target for most central banks, and it can be achieved through the maintenance of the internal and external values of the domestic currency.
- ♦ The intermediate target is an economic variable which the central bank can control with a reasonable time lag, a reasonable degree of precision and which is a relatively stable or at least predictable in relation with the final target. The popularity of the intermediate target concept has decreased over the last two decades, but when used it may be a monetary aggregate (such as M_0 , M_1 , M_2 or M_3) or the exchange rate.
- ♦ The operational target is an economic variable which the central bank wants and can control on a day – to – day basis through the use of monetary

policy instruments. Today there is consensus among central banks that the short-term interest rate is the appropriate operational target.

1. Monetary Policy implementation framework

The monetary policy framework comprises the set of instruments to be used as well as the way in which it uses these instruments in order to meet its operational target. An efficient monetary policy framework allows the central bank to effectively steer its operational target as dedicated by the monetary policy strategy and is the first step towards an overall successful monetary policy. The operational framework is the main factor shaping the structure of the money market, which plays a fundamental role in the first steps of monetary policy transmission. There is no ideal framework for implementing monetary policy, but there are general principles for selecting an efficient operational framework.

General principles for the choice of operational framework :

The operational framework should be :

- ♦ Effective, it should allow the central bank to effectively control the operational target.
- ♦ Promote liquidity and efficiency of the financial markets.
- ♦ Transparent and simple, the set of instruments should be non-redundant.
- ♦ Conform to market principles and free competition
- ♦ Ensure an equal treatment of counterparties fulfilling the requirements for accessing the central bank operations.
- ♦ Allow for a cost-efficient implementation of monetary policy both in terms of resources spent by the financial markets and in the central bank, and should minimize the financial risk of the central bank.
- ♦ Flexible, in order to make it unlikely that it turns out to be inappropriate when the environment of the implementation of the monetary policy changes in an unforeseen way.

Monetary Policy Instruments

There are three basic types of instruments are used: reserve requirements, open market operations, and standing facilities. Most central banks use a mix of the three instruments.

The basic requirement for the set of instruments should be efficient, consistent, market oriented, non-discriminating and should allow monetary policy operations to be carried out.

I. Reserve Requirements

Reserve requirements are the percentage of commercial banks' liabilities (or some of them) the banks are obliged to keep at the central bank.

Reserve requirements are a compulsory instrument, so the desire to reduce the element of compulsion has generally led to the reduction in their levels.

The non-remuneration of reserve requirements or remunerating them at less than market rates represents a tax on the banking system. In the same time it provides income for central banks. The importance of reserves as a prudential tool has lessened.

In the sphere of monetary policy, reserve requirements have main role:

- Using an average over a period of time can help reduce volatility in market interest rates on a day-to-day basis.
- The change in the level of reserve requirements is one of the main instruments used by some central banks when setting monetary policy.
- Reserve requirements can be used to create structural liquidity deficit in the market as it is believed that managing liquidity through the deficit may give greater influence over market rates.

II. Open market operations

- Open market operations (OMOs) have become the major instrument of monetary control in developed countries. In those countries the evolution of a well-developed active inter-bank, money and securities markets has enabled central banks to undertake outright or repurchase agreements in securities or foreign exchange as needed to provide or absorb bank reserves. In the globalized financial world, open market operations are also becoming increasingly important to developing countries.
- OMOs are conducted at the initiative of the central bank but with a voluntary participation by individual counterparties in the banking system.
- In general OMOs can be conducted in one of two ways. They can be actively aimed at a given quantity of reserves, letting the price of reserves fluctuate freely along with fluctuations in the pressure on banks' liquidity. Or open market operations can be aimed at a particular market interest rate, letting the amount of reserves be provided at the central bank's own initiative be determined passively as a function of demand at that price.
- OMOs are used for influencing inter-bank interest rates either to reduce volatility of short-term rates, or to steer inter-bank market rates towards levels considered appropriate with the desired stance of monetary policy and consistent with macro-economic policies.
- OMOs can be conducted in the primary market or in the secondary market.

- The advantages of OMOs are :
 - The great flexibility in the timing and volume of monetary policy operations as it may be conducted at a pre-announced trading sessions or at any time chosen by the central bank.
 - It permits a market-oriented relationship with counterparties and avoids the economic and market inefficiencies of direct control.

III. Categories of OMOs:

The central bank has a number of options to provide or absorb liquidity.

- ❖ In case of a temporary shortage of reserves it can provide liquidity with short maturity in the form of :
 - Collateralized loans to banks.
 - Purchase outright securities
 - Offer repo transactions
 - Undertake foreign exchange swaps.
- ❖ In case of a temporary excess of reserves it can withdraw liquidity for a short time in the form of :
 - Invite banks to place deposits with the central bank.
 - Sell outright securities
 - Undertake repos
 - Undertake foreign exchange swaps

IV. Standing Facilities:

- In the context of indirect monetary managements, standing facilities are to be defined as monetary policy instruments that may be used at the initiative of the individual banking institutions.
- Standing facilities can play an important monetary function. In particular :
 - They set boundaries for short term market interest rates, and thus limit its volatility.
 - They enhance central bank's credibility since access is based on compliance with clear rules.
 - They may play a role in providing liquidity to the market in the situation when open market operations are not yet fully effective.
 - They perform an important signalling function of the monetary policy stance.

- Central banks usually provide two kinds of standing facilities:
 1. Refinance standing facilities: allows banks to borrow from the central bank on demand and thus serve to inject liquidity into the system. They perform the function of safety valve which helps limit pressures on the overnight rate by providing adjustment credit to meet reserve deficiencies or avoid end of day overdrafts.
 2. Deposit standing facilities: deposit standing facilities are the inverse of refinance standing facilities. They offer banks an open facility to deposit remunerated funds at the central bank, and serve to absorb temporary excess liquidity in the system, thus preventing market rates from dropping significantly below the interest rate paid by the central bank.
 - Going back to keeping with the safety valve nature of standing facilities, they tend to be relatively short term, whether using short term loans (or deposits) or repos or the outright purchase by the central bank of short term securities.
 - Central banks in most developed market economies make available standing credit facilities, and could also use a deposit facility to put a floor below market rates, but standing deposit facilities are less widely used than lending facilities.

A lending facility above market rates provides only an upper limit for market rates. If market rates threaten to rise above the lending facility, banks will tend to curtail borrowing from the market and will borrow from the facility, with the effect of limiting the rise in the market rates.

Criteria for choosing monetary instruments and instruments mix:

Several structural factors play an important role in determining the appropriate mix of instruments at a given period:

- The level of price competition in the banking and securities markets.
- The characteristics of the money markets.
- The soundness of the banking system.
- The reliability and the efficiency of the clearing and settlement.

In countries with well developed money markets, standing facilities can be operated in support of OMOs, in particular to limit short-term money market interest rate volatility. The ability of the central bank to conduct frequent and flexible OMOs and its degree of willingness to accept some volatility of market rates will affect the function of standing facilities. In particular, great willingness to accept market rate volatility will result in lower reliance on standing facilities and/or a wide corridor, and vice versa. Moreover, averaging provisions for reserve requirements will tend to diminish the role of standing facilities, since such provisions will tend to stabilize the demand for and provision of

interbank funds. Conversely, the absence of reserve requirements or the averaging provisions, combined with the desire of the central bank to limit short-term interest rate volatility, will most likely result in the use of a corridor approach, or frequent fine tuning OMOs.

The most wide-spread operational framework

In spite of the lack of text books on monetary policy implementation, one may distinguish two operational frameworks which comprise the same set of instruments, but different approaches concerning how these instruments are actually used in order to steer the overnight rate:

- ***The Standing Facilities approach :***

In this approach interest rates are primarily steered through overnight standing facilities. In the most reasonable variant of this approach, the rate of one of the standing facilities is set at the policy rate. The structural liquidity position of the banking system then ensures that there is a systematic need for banks to take recourse to that facility, the rate of which will forcefully determine the overnight rate.

- ***The Open Market approach :***

In this approach the short term interest rates are primarily steered through open market operations. The policy rate is not identical to any of the standing facility rates, but is set somewhere below the rate of the marginal lending facility and above the deposit facility rate. The purpose of interest rates corridor in this case primarily is to limit the volatility of the overnight rate.



Liquidity Management

Central banks seek to exploit their monopoly in the creation of base money to regulate overall liquidity conditions in the economy by influencing the underlying demand and supply conditions for central bank money. This is done aiming at influencing the balance sheet of the commercial banks through the balance sheet of the central bank

Central bank liquidity management comprises forecasting the liquidity needs of the banking system for the central bank money and supplying or absorbing the appropriate amount of liquidity through open market operations. Liquidity management in general manages to keep the short-term money market interest rates close to the announced rate.

○ *Liquidity forecasting :*

Liquidity forecasting is a key part of a central bank's sound liquidity management framework. Liquidity forecasts enable the central bank to decide on how much liquidity to provide or withdraw from the market on a day-to-day basis with the objective of smoothing undesirable fluctuations in liquidity demand and supply. The purpose of this smoothing of fluctuations is to create stable liquidity conditions and steer the central bank's operating target.

A clear and efficient organization of the liquidity forecasting process is essential to produce accurate and timely projections. Liquidity forecasts should be arranged as a rolling process under which every new piece of information is promptly incorporated. Liquidity forecasting horizons and forecasting intervals differ with institutional setups. In systems with reserve requirements, the forecasting horizon should comprise at least the current maintenance period. Optimally, Liquidity forecasts should be at daily intervals.

Forecasting liquidity process using the appropriate techniques is essential but additional factors are crucial :

- * Communicating with the different information sources and ensuring the timely receipt of the data.
- * Supervising the consistency of the forecasted components.
- * Producing an overall liquidity projection which is daily updated.
- * Assessing forecasting errors.

Overview of the demand for and the supply of liquidity

The demand for and the supply of liquidity and the interaction between monetary policy operations and the banking system can be illustrated by the central bank balance sheet. The main components of bank's demand for liquidity and the autonomous supply of liquidity can be derived from the central bank balance sheet. Based on the projected gap between the liquidity demand and autonomous supply the central bank can decide on the appropriate level of liquidity to be added to or withdrawn from the market.

The autonomous factors of liquidity supply comprise:

- Net foreign assets.
- Net position of government with the central bank.
- Currency in circulation.
- Other items net.

Liquidity demand consists of demand for reserve requirements and excess reserves. By comparing the forecasted demand and the projected autonomous factors of the supply of bank reserves, the central bank gets an estimate of the excess supply of or demand for liquidity. The excess supply implies a structural surplus liquidity in the banking system then the central bank conducts operations to absorb liquidity, the excess demand for liquidity implies structural liquidity deficit the central bank conducts operations to provide liquidity.

○ ***Monetary operations, and liquidity structure***

Market oriented policies aim at actively managing liquidity, where the central bank signals its monetary stance and supports this by structures or operations which keep the market interest rates close to the announced target.

The structural liquidity position affects the design of the operational framework and the selection of the monetary policy instruments.

Liquidity deficit and surplus can be defined as follows :

◆ Deficit :

Liquidity deficit of the banking system vis-à-vis the central bank is defined as the net sum of monetary operations, considered as an asset, in other words the sum of the current account and net autonomous factors as liability items.

◆ Surplus :

Liquidity surplus of the banking system vis-à-vis the central bank means the net sum of the autonomous liquidity factors and reserve requirements as liabilities.

It has been argued that a structural liquidity surplus does not provide an optimal ground for monetary policy implementation and that monetary policy implementation takes place preferably with the banking system being in a liquidity deficit vis-à-vis the central bank; and that the size of the deficit should be sufficiently large, which also ensures that there are no short-term risks of a change of sign of the deficit.

Why structural surplus is not preferable?

Practices proved disadvantages for the structural surplus include:

1. The profitability and financial independence of the central bank: the structural surplus affects the profitability and financial independence of the central bank through:
 - The capital and reserves account, is an indicator of past profitability and of financial buffer against future losses.
 - In the medium and longer terms, the profitability depends mainly on operating costs and possible obligation of the central bank (imposed by the government) to engage in loss making activities.
 - In the short term, the profitability of the central bank may be affected heavily by changes in:
 - * exchange rates;
 - * longer-term interest rates; and
 - * monetary policy interest rates.

Lack of profitability of the central bank is important since it is key to the central banks' independence from the government and to the likelihood that the central

bank will set monetary policy (short-term interest rates) only according to monetary policy needs.

2. Dealing with structural surplus through operations to withdraw liquidity at the market rates could be considered as a negative incentive for the credit growth (because of the possible upwards impact on interest rates).

3. Structural or systematic operations to absorb liquidity from the market may implicate monetary policy or interfere with its transmission mechanism, since there is no incentive to reduce interest rates.

4. Where there is a structural surplus in emerging or non developed economies and financial markets, especially with the counterparties of the central bank, it is expected to see practices which may hurt the efficiency of monetary policy, examples are as follows:

a) The weaknesses in the market infrastructure implies lack of competition resulting in insufficient participation in monetary operations, at times the inability of the central bank to undertake effective monetary policy actions to deal with excess liquidity may result in failure to achieve the operational target.

b) If the assumption of perfect inter-bank markets is dropped, then further recourse to standing facilities may occur at a non-aggregate level at any point in time of the maintenance period. The recourse has nothing to do with the aggregate liquidity situations, but mainly reflects transactions costs or failures in the payment systems and non-anticipated end-of-day payment flows which occur too late to still allow a correction via the interbank market and which cannot be averaged out through reserve requirements.

5. Both the central bank and the government are issuing assets; this might create some confusion, and should also lead to competition between the two entities.

6. There is a scope for collusion i.e. large banks could agree not to bid at too low rates.

7. It is argued that the banking system is not sufficiently dependant on the central bank's liquidity management, as the banking system has multiple asset allocation choices.

But it is still the case that a monetary policy framework with a corridor system (its boundaries are the lending and deposit standing facilities rates), reduces the volatility of the market rates.

Sometimes, central banks take structured monetary policy measures to increase the liquidity deficit, for example establishing a reserve requirement or increase it, or conduct liquidity absorbing structural monetary policy operations (such as issuing debt certificates), then the central bank can efficiently conduct monetary operations which help to :

- ♦ Make the banking system dependent on the central bank. The central bank is the final supplier of the liquidity that the banks need in order to perform their tasks. This enables sufficient and competitive participation in open market operations, and encourages trading in the interbank money market.

- ♦ The central bank is providing liquidity while the government borrowing funds - so no possibility for competition.
- ♦ It generates income to the central bank.

Reasons behind structural liquidity surplus

Two main reasons behind structural liquidity surplus:

(a) Capital inflows

Transition economies, which have achieved macroeconomic stability, and liberalised capital flows and financial markets, usually face increased capital inflows, as they move from state ownership to private ownership (as their nominal interest rates are higher rather than in the developed countries). As these capital inflows are predominantly equity rather than debt, and if these flows are short-term in nature, then it may be useful for the central bank to sterilize the liquidity resulted from these capital inflows.

(b) Fiscal dominance

Fiscal dominance and lack of fiscal discipline undermines the investor confidence, and makes it difficult for the government securities market to emerge. So fiscal dominance may hamper the effectiveness of money market operations.

Possible solutions

Possible solutions could be:

- 1- Establishing a sound financial relationship between the central bank and government, this relation can be created through curtailing the ability of the government to rely on direct credit from the central bank.
- 2- Reduction in fiscal deficit levels, as large sales of government securities to finance the fiscal deficit may lead to raising interest rates, which in turn may result in pressure to reduce the volume of securities issued and instead monetize the fiscal deficit.
- 3- The costs of conducting monetary policy which are associated with the sterilization operations are ultimately a fiscal problem. If the central bank uses the government securities issued for monetary policy purposes, or uses its securities (or accept deposits) the related costs are born by the central bank, and may lead to large losses for the central bank. In order to avoid the potential for profitability considerations to take precedence over monetary policy considerations, it is important to take the necessary arrangements to ensure that the losses of the central bank are passed to government in a timely manner.
- 4- Improving the liquidity forecasting process can help financial institutions' liquidity management and contribute actively to the monetary operations conducted by the central bank.
- 5- Improve the infrastructure and promote competition to ensure that interest rates are market rates.

6- Clearing the central bank balance sheet from the non-market government debt – if it exists – may lead to a banking system with structure liquidity deficit vis-à-vis the central bank instead of liquidity surplus.

Areas for development

The payment system, the accounting and auditing systems are an essential part of the infrastructure; they should ensure that transactions are settled in a timely and reliable manner and that such transactions are recorded appropriately and accurately. Central bank transparency, credibility, and accountability are needed to formulate and implement an efficient monetary policy.

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