Box IV.2
Global Macroeconomic Imbalances

The US has been a key engine of the global economic recovery since the late 1990s. Accommodative monetary and fiscal policies have enabled a strong growth in the US economy in the aftermath of the bursting of the information technology bubble. While real activity in the US has provided stimulus to activity in the rest of the world, it has been accompanied by large and growing twin deficits - fiscal as well as current account deficits. The current account deficit of the US has widened from US $ 117 billion in 1996 to an estimated US $ 631 billion in 2004 or from 1.5 per cent of GDP to an estimated 5.4 per cent of GDP. The deficit is expected to remain above five per cent in 2005. Large US current account deficits have been mirrored in huge current account surpluses and rising foreign exchange reserves in the rest of the world, mainly the Asian countries (Table 4.7 and Chart IV.7).

Existing research indicates that large current account deficits typically undergo correction when these are in excess of some threshold. For industrial economies, this threshold is estimated to be five per cent of GDP (Freund, 2000; Milesi-Ferretti and Razin, 2000). For the US, existing studies place the threshold between 2.5-3.5 per cent of GDP (Mann, 2003) and 4.5 per cent of GDP (Obstfeld and Rogoff, 2002). An analysis of the three largest swings in the US current account over the past five decades shows that the exchange rate had a prominent role in these swings. Almost two-thirds of the widening of the US trade deficit from 1996 to 2003 can be attributed to appreciation of the US dollar between 1995 and 2002. In view of (i) income elasticity of US exports being higher than its imports and (ii) US GDP growth being in excess of the rest of the world, exchange rates will have a prominent role in the adjustment of the present current account imbalances. With unchanged growth rates in the US and the rest of the world, the US dollar would need to depreciate by nearly 33 per cent - equivalently, the non-US currencies would have to appreciate, on average, by 50 per cent - to balance the US trade account (Gagnon, Leahy and Thomas, 2004). According to Obstfeld and Rogoff (2004), the trade-weighted US dollar needs to depreciate, at least, by another 20 per cent. While further deepening of the international financial markets can sustain the US current account imbalances, it can only postpone the day of reckoning as the ultimate exchange rate adjustments will have to be more extreme (Obstfeld and Rogoff, *op cit.*).

curb household and government borrowings and strengthen national savings. The Euro area continues to depend largely on external demand. It, therefore, will need to pursue some structural reforms, especially in the labour policies, to boost domestic demand. Japan also needs to continue to take some concrete measures to strengthen its financial system and reduce huge fiscal imbalances" (Mohan, 2004b).

Table 4.7: Global Imbalances on the Current Account

(US $ billion)

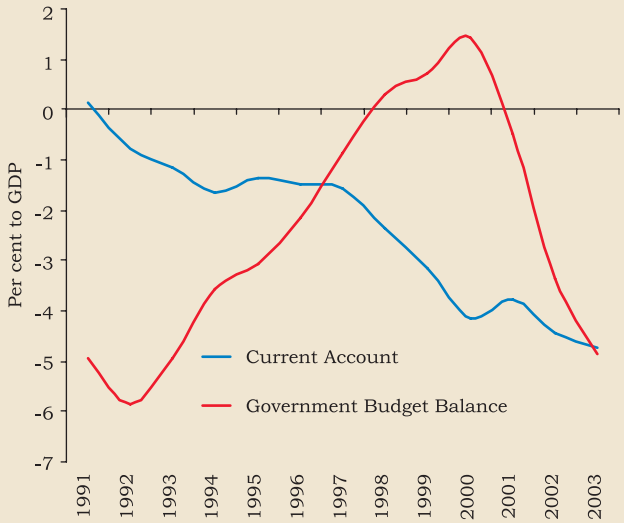
Country/Region	1996	2002	2003	2004	2005 (Projections)
1	2	3	4	5	6
USA	-117	-474	-531	-631	-642
Euro area	78	53	26	72	88
Japan	66	113	136	159	149
Developing Asia	-38	70	86	69	69
Middle East	11	29	58	104	108
As per cent to GDP					
USA	-1.5 (-2.1)	-4.5 (-3.3)	-4.8 (-3.8)	-5.4 (-4.4)	-5.1 (-3.9)
Euro area	1.1	0.8	0.3	0.8	0.9
Japan	1.4	2.8	3.2	3.4	3.2
Developing Asia	-1.9	2.9	3.1	2.2	2.0
Middle East	2.2	4.5	8.1	12.7	12.5

Note : Figures in brackets are fiscal deficit/GDP ratios (General government structural balance as per cent of potential GDP).
Source : World Economic Outlook, IMF, September (2004).

Surges in Capital Flows and Monetary Policy

4.26 As noted earlier, EMEs have been grappling with large surpluses on their current as well as capital accounts in the recent 3-4 years. The excess supplies in the foreign exchange markets pose threat to price stability in EMEs. Following Mundell, it is well-known that the trinity of desirable objectives, *viz.*, a fixed/ managed exchange rate (for relative price stabilisation

Chart IV.7 : Macroeconomic Balances in the US



Source : International Economic Trends, Federal Reserve Bank of St. Louis, July (2004).

purposes and as a credible nominal anchor), an independent monetary policy (for output stabilisation purposes) and an open capital account (for greater efficiency) can not be achieved simultaneously. Since only two out of the three desirable objectives are mutually consistent, the policy makers have to give up one of the objectives leading to what is called "policy trilemma" (Obstfeld and Taylor, 2002). Over the past century, countries have experimented with alternative monetary and exchange rate arrangements. The way out of the trilemma was provided by giving up monetary policy independence during the gold standard era (1870-1914), free movement of capital during the Bretton Woods era and exchange rate fixity in the recent decades. The impossible trinity can also be viewed as a constrained sum in which fractions are possible (McCauley 2001). That is, an independent monetary policy (1) might be combined with semi-fixity of the exchange rate (1/2) and a halfway open capital account (1/2). Capital account openness, therefore, should not be viewed as an all-or-nothing proposition and this appears to be the practice in most of the developing world.

4.27 Empirical evidence shows almost full adjustment of local interest rates to foreign interest rates during the 1990s, irrespective of the exchange rate regime, for most of the countries, with the notable exception of Germany and Japan. The speed of adjustment of domestic rates is, however, faster for pegged exchange rate regimes than under other regimes. The evidence thus suggests falling monetary independence during the 1990s, *albeit* with some degree of temporary monetary independence for flexible exchange rate countries (Calvo and Reinhart, 2002; Obstfeld, Shambaugh and Taylor, 2003; Frankel, Schmukler and Serven, 2002). Monetary authorities attempt to overcome the constraints imposed by the impossible trinity in the short-run through sterilisation using a variety of instruments.

4.28 In a fixed exchange rate regime, excess forex inflows would perforce need to be taken to forex reserves to maintain the desired exchange rate parity. On the other hand, in a fully floating exchange rate regime, the burden of adjustment would be borne by the exchange rate. In case capital flows are persistent and large, the exchange rate may appreciate significantly with implications for external competitiveness and overall macroeconomic stability. Accordingly, in practice, the central banks intervene in the forex markets in almost all countries. At the same time, a more intensive approach to intervention may be warranted in the EMEs as capital flows in these economies are often relatively more volatile and sentiment driven, not necessarily being related to the fundamentals in these markets. Such volatility imposes substantial risks on market agents, which they may not be able to sustain or manage (RBI, 2004b).

4.29 The absorption of foreign exchange by the central banks, however, has its own limitations. Intervention purchases by the central bank result in an expansion in base money and, through the money multiplier process, in broader monetary aggregates and may spillover into domestic inflation. This may hurt external competitiveness, even with an unchanged nominal exchange rate. Thus, the objective of the monetary authority to prevent nominal appreciation would be defeated as the concomitant monetary expansion ends up with similar adverse consequences for exports and, in turn, output and employment.

4.30 It is, therefore, critical that the adverse effect of purchases of foreign currency by the central bank on monetary aggregates and inflation be offset or 'sterilised'. The classical form of sterilisation is through the use of open market operations (OMOs), that is, selling Treasury bills and other instruments to reduce the domestic component of the monetary base. Narrowly defined, sterilisation is the exchange of bonds rather than money for foreign exchange (Schadler *et al.,* 1993). Open market sales of government bonds (or central bank's own bills) suck out liquidity from the financial system and, thus sterilise the expansionary effect of money supply. Sterilisation is the most popular policy response and has been virtually used by all countries facing capital surges during the 1990s. It also avoids the burden on the banking system of higher reserve requirements. Moreover, by limiting the role of banking system in intermediating the flows, sterilisation operations reduce bank's vulnerability to sudden reversal of flows (Lopez-Mejia, 1999). Apart from government bonds/ bills, central banks in a number of countries like Chile, China, Colombia, Indonesia, Korea, Malaysia, Poland, the Philippines, Peru, Russia, Sri Lanka, Taiwan and Thailand have resorted to the issuance of their own securities to conduct open market operations for sterilisation (Box IV.3).

4.31 Sterilisation - whether through Government securities or central bank's own securities - has its own limitations. It is important to know as to whether capital flows are temporary or permanent. In case such flows are believed to be permanent, sterilisation may not be an appropriate policy response. For

Box IV.3

Central Bank Bills

The effective conduct of open market operations by the central bank as a tool for sterilisation is often constrained by the depth of the Government bond markets. This may be due to inadequate volume of Government securities for the conduct of open market operations and undeveloped/underdeveloped markets for Government securities. Many central banks have accordingly taken recourse to issuances of their own securities to absorb excess liquidity. The choice between issuing central bank securities or offering special treasury issues created specially for the purposes of monetary policy has depended mostly on institutional and market considerations (Axilrod, 1998; RBI, 2003d).

Central bank issues have been used to conduct open market operations in Indonesia, where domestic Government debt is not allowed. In the Philippines, the central bank took the same course in the early 1980s because it did not have access to sufficient Government debt. The Bank of Korea (BoK) introduced Monetary Stabilisation Bonds (MSBs) in 1961. The Czech National Bank (CNB) issued its own debt in 1992 to mop up liquidity from the banking system. The National Bank of Poland (NBP) conducted sterilisation operations by introducing central bank securities of different maturities during 1994-97. From 1995 to mid-1997, the Bank of Thailand issued bonds to absorb excess liquidity arising from huge capital inflows from abroad and in the context of the Government's budget surplus. In 1993, the Bank Negara Malaysia began to issue Bank Negara Bills which are similar to Malaysian Government Treasury Bills. This was since treasuries issuance was dwindling in line with the shrinking Government deficit. Bank Negara Malaysia issued BNM bills equivalent to 2 per cent of GDP in 2000; the issuances have increased sharply in recent years, leading to substantial sterilisation costs (RBI 2003d). In Taiwan, the central bank issues Negotiable Certificates of Deposits (NCDs) to mop up excess liquidity from the financial system. The NCDs are issued through competitive/non-competitive bidding in various denominations with maximum maturity of three years and sold, either on outright basis or under repos. The People's Bank of China (PBC) started outright issue of central bank bills from April 22, 2003 in view of the limited Government bond holdings of the central bank.

Country experiences show that excessive reliance on central bank securities for conduct of open market operations puts a strain on the central bank's balance sheet. Costs of sterilisation mount as continuous sterilisation bids up the rates at which successive issuances can be made. This erodes the profitability of the central bank and several central banks have suffered losses - Chile (1.0 per cent of GDP per annum during 1993-98), Colombia (0.5-0.7 per cent in the early 1990s), Mexico (0.2-0.4 per cent during 1990-92) and Poland (1.0 to 1.15 per cent of GDP during 1995-97) (Ariyoshi *et al* 2000; RBI 2003d).

Moreover, issuance of central bank bills results in two sets of competing risk-free papers (along with government securities), with a similar yield curve (RBI, 2003d). In countries with large fiscal deficits, the problem is exacerbated by public confusion regarding the relationship between the two. Where the central bank is vested with the responsibility for public debt management, issuance of the central bank bills can potentially sharpen the trade-off for the central bank between the objectives of monetary policy and those of public debt management. It also leads to fragmentation of debt markets, which can lead to instability in the Government borrowing programme.

economies with imperfect asset substitutability resulting from impediments to free cross border movements of capital and with a fully/partly regulated interest rate regime, sterilisation can be effective to an extent. Sustained sterilisation operations may, however, keep domestic interest rates high. This could attract even larger short-term inflows and thereby increase the overall volume of capital inflows rather than reducing them (Lee 1996; Montiel and Reinhart, 1999; RBI, 2004a). By keeping domestic interest rates high, sterilisation could also alter the composition of capital flows, away from stable long-term FDI inflows and towards volatile short-term and portfolio inflows. The intensity of the open market operations has varied substantially across countries and across time. For example, capital inflows were almost fully sterilised in Chile during the first half of 1990, Indonesia during 1991-92, Malaysia from mid-1991 through early 1993 and Sri Lanka in 1991-93 (Folkerts-Landau and Ito, 1995). Most of the East Asian developing countries have been able to employ sterilised intervention effectively.

4.32 Since domestic securities sold by the central bank in its OMO sales typically earn higher interest rate than that on foreign securities acquired by the central bank, sterilisation operations involve costs, termed as quasi-fiscal costs (QFCs), and these QFCs could turn out to be substantial with adverse implications for the central bank balance sheet *per se* and future conduct of monetary policy. For Latin American countries, these QFCs have been estimated to be between 0.25 and 0.5 percent of GDP (Calvo *et al.*, 1993; Khan and Reinhart, 1995). Although QFCs may not be large *per* se, these could increase significantly during brief surges in capital flows and may influence the future course of central bank sterilisation (Kletzer and Spiegel, 1998). In case, capital flows continue to persist, these QFCs can become quite large and these may render further

sterilisation operations unsustainable. In such a scenario, central banks are quite likely to reduce the scale of their sterilisation operations and will be forced to let burden of adjustment to be borne by exchange rate. Kletzer and Spiegel (2004) find support in favour of this hypothesis for a group of 22 countries using quarterly data between February 1984 and April 1992. On the whole, however, opportunity cost of reserves seldom exceeds 0.5 per cent of GDP (see Table 4.6) (IMF, 2004). Apart from losses on account of interest rate differentials, central banks may be exposed to capital losses in case their exchange rates were to appreciate sharply. According to Higgins and Klitgard (2004), a 10 per cent appreciation of the domestic currency could lead to domestic currency capital losses ranging from 3 per cent of their GDP for Korea and China to 8 per cent for Taiwan and 10 per cent for Singapore.

4.33 Countries have, therefore, often supplemented sterilisation measures with a number of other steps - the "belts and braces" strategy, which combines indirect instruments of monetary policy with some capital controls. The choice of instruments for sterilisation is often critical, especially as the degree of market orientation and the associated incidence of the cost on the central bank and the banking system varies a great deal (Jadhav, 2003). Policy responses have been conditioned by a number of factors, *viz*., the country's anti-inflationary track record, the openness of the economy to foreign trade, the depth of the domestic bond market, the degree of irreversibility of trade reforms, the health of the financial sector, the presence of non-banks in the financial system, the flexibility of fiscal policy and the health of public finances, the strength of the regulatory and supervisory framework, and the market's perception about the credibility and consistency in macroeconomic policies.

4.34 Apart from sterilisation through OMO sales, increase in cash reserve requirements and imposition of Tobin-type tax measures have been used by a number of countries (Table 4.8 and Box IV.4). Recent examples

Table 4.8: Use of Reserve Requirements to Manage Capital Inflows

Country	Increase in Reserve Requirements
1	2
Argentina (1991)	From 40 per cent to 43 per cent (August 1993) #
Brazil (1992)	From 10-15 per cent to 30 per cent on savings deposits; 100 per cent marginal reserve requirement on demand deposits, 20 per cent (subsequently increased to 30 per cent) on time deposits and 15 per cent reserve requirement on loans for the purchases of goods also introduced (July 1994-December 1994)
Chile (1990)	Non-remunerated 20 per cent reserve requirement on deposits and loans in foreign currency to be maintained for one year and a 30 per cent marginal reserve requirement on inter-bank deposits introduced (January 1992-May 1992)
Colombia (1991)	Marginal reserve requirement of 100 per cent imposed on all new deposits; subsequently, replaced by an increase in reserve requirements on most deposits (January 1991-September 1991)
Czech Republic (1992)	From 9 per cent to 12 per cent (August 1994)
China $	Reserve requirement increased in two-steps: from 6 per cent to 7 per cent (effective September 21, 2003) and further to 7.5 per cent (effective April 25, 2004)
Kenya (1992)	From 12 per cent to 20 per cent (October 1993-March 1994)
Malaysia (1989)	From 3.5 per cent to 11.5 per cent (May 1989-1994) @
Mexico (1990)	A compulsory liquidity coefficient for dollar liabilities set at 15 per cent (April 1992)
Sri Lanka (1991)	From 13 per cent to 15 per cent (November 1991 to February 1994)
Thailand (1988)	From 0 per cent to 7 per cent (August 1995).

Note : Figures in brackets next to a country name are the first year of the surge in inflows while the period in brackets in column 2 is the period over which the ratio was increased.

\# On domestic and foreign currency demand deposits. In addition, a three per cent reserve requirement was also introduced on domestic and foreign currency 30-89 day time deposits.

$ In addition to increase in reserve requirements, a differentiated reserve requirement system was also put in place whereby the reserve requirements applied to financial institutions are dependent upon a number of criteria such as capital adequacy, asset quality, non-performing loans.

@ The base for reserve liabilities was extended to include (i) all outstanding ringgit received through swap transactions with non-residents (effective September 16, 1991) and (ii) foreign currency deposits and transactions such as foreign currency borrowing from foreign banking institutions and inter-bank borrowing (effective January 3, 1994).

Sources : 1. Reinhart and Reinhart (1999).
2. People's Bank of China website.

Box IV.4

Tobin Type Taxes : Country Experiences

In the context of large capital flows, countries have used a wide range of instruments. One such instrument consists of explicit taxes or tax-like measures on inflows. The simplest example of an explicit tax is a tax on foreign exchange trading or on short-term cross-border bank loans, commonly known as the Tobin tax. Tobin tax, first proposed in 1972, was originally intended to deter short-term currency speculation. The burden of a Tobin tax is inversely proportional to the length of the transaction, *i.e.*, the shorter the holding period, the heavier the burden of tax (Table 4.9).

Variants of Tobin tax are available in the cross-country experience. An interest equalisation tax that equates the rate of return on domestic and foreign assets was imposed on capital flows in Brazil in 1993 on some classes of foreign exchange transactions. These were expanded in 1994 but scaled back, in 1995, in response to the Mexican crisis. Chile and Colombia have resorted to a system of unremunerated reserve requirement (URR) to discourage short-term capital inflows.

Chile has relied on URR on two occasions: 1978-82 and 1991-98. In both episodes, foreigners wishing to move funds into Chile were required to make non-interest bearing deposits at the central bank - a system equivalent to a tax on capital inflows. During the 1978-82 episode, inflows with maturities below 24 months were prohibited while those with maturities from 24 months to 66 months were subject to reserve requirements of 10-25 per cent of the value of inflows. Chile reintroduced restrictions on capital inflows in June 1991 in the face of a surge in capital inflows. Originally, all portfolio inflows were subject to a URR of 20 per cent. For maturities less than one year, the deposit was required to be maintained for the maturity of inflows; for inflows with maturities above one year, deposit was to be maintained for a period of one year. In view of attempts to avoid the URR by mis-stating portfolio inflows as trade credits or as direct investment inflows, the coverage of URR was extended to trade credits as well as FDI loans in July 1992. Moreover, the URR was raised to 30 percent, and its holding period was set at one year, independent of the length of stay of the flow. In an effort to close additional loopholes, the controls were extended, in 1995, to Chilean stocks traded on the New York Stock Exchange and to international bond issues. In order to reduce the risk of contagion from the Asian financial crisis, URR was reduced to 10 per cent in June 1998 and finally withdrawn in September 1998.

Colombia also introduced capital controls in the form of a URR on external borrowing in September 1993. In an effort to target short-term inflows, the URR was limited to loans with maturities up to 18 months. The URR was subsequently modified several times to better target short-term inflows (with higher rates applied to shorter maturities). As in Chile, following the Asian crisis, the URR was substantially reduced to contain exchange rate pressures.

The effectiveness of these tax measures remains a matter of debate. As these measures are subject to evasion, authorities are forced to widen the coverage repeatedly to make them effective (Valdes-Prieto and Soto, 1998; Cowan and De Gregorio, 1997). In Chile, the controls became effective in discouraging short-term flows only after 1995, when the implicit rate of taxation imposed by the controls increased significantly. However, the reduction in short-term flows was fully compensated by increases in long-term capital inflows and the aggregate capital moving into Chile was not altered by the controls. As there was no significant effect on overall capital flows, the measures could not check real appreciation although controls had some, *albeit* small, effect on domestic interest rates (Soto, 1997; De Gregorio *et al*, 1998; Edwards,1999). As regards their contribution to financial stability, these controls may have been able to protect Chile from relatively small external shocks but were not effective in preventing “contagion” from very large shocks stemming from East Asia in 1997-1999 (Edwards, 1999).

Table 4.9: Tax Rate on Short-term Capital Inflows According to Maturity

(Per cent)

Number of Months	Chile	Colombia
1	2	3
1	95	140
2	90	137
3	74	135
6	55	127
12	30	112
18	16	100
24	9	88
36	3	69
48	1	56
60	0	43

Source : Reinhart and Smith (1998).

include a two-step increase in reserve requirements by China and a differential reserve requirement system (Box IV.5). Countries have also imposed differential reserve requirements between domestic and foreign currency liabilities and/or resident and non-resident deposits. A key limitation of across-the-board reserve requirements is the dead weight cost borne by the market in the form of an indirect tax on the banking system (Jadhav, 2003). Reserve requirements widen deposit-lending rate spreads and promote disintermediation as new institutions and instruments arise to bypass controls, thereby hampering efficient allocation of credit. For a sample of 20 episodes, Reinhart and Reinhart (1999) found that spreads widened in as many as 17 episodes. Both depositors and lenders share the tax: while deposit rates fell in 14

Box IV.5

Sterilisation of Capital Flows: The Chinese Experience

China has emerged as a key driver of world growth. Its real GDP has recorded an annual average growth of almost nine per cent per annum in the recent decade. According to purchasing power estimates, China contributed almost one-third of global growth in the recent three-year period (2000-2003). At the same time, concerns are being expressed that the Chinese economy is getting over-heated due to excessive investment. Excess demand in sectors such as real estate, cement and steel where investment has been very strong is leading to overcapacity. This can cause a boom-bust cycle and may increase non-performing loans. These concerns mainly emanate from substantial external inflows and their impact on the money supply process.

China has recorded surpluses not only on its capital account but also on its current account in the recent decade (Table 4.10 and Chart IV.8). Although both capital and current account surpluses fell in the aftermath of the Asian financial crisis, these have subsequently recovered to their pre-crisis levels. Given the fixed exchange rate, the People's Bank of China (PBC) has been absorbing the excess supplies in the foreign exchange market. Consequently, China's foreign exchange reserves jumped multi-fold from US $ 22 billion in 1993 to US $ 515 billion in September 2004. The rapid increase in foreign exchange reserves has, in turn, led to a high growth rate of broader monetary aggregates. Initially, inflation in China remained subdued and in fact, China experienced deflation during 2002. The liquidity overhang coupled with robust economic activity, however, has led to emergence of inflationary pressures although inflation is, in part, due to supply shocks from food prices.

Since early 1990s, the PBC has been undertaking a number of steps to sterilise the impact of external inflows. Initially, capital controls were used as the main instrument. The PBC also relied on calling back relendings to sterilise the excess money supply. However, with dwindling relending amounts over the years, the scope to change relending for the purpose of sterilisation reduced significantly. Open market operations were initiated in 1996. In view of the negligible holdings of Government bonds by the PBC, it was not possible to carry out OMOs in any significant way to contract the money supply. The PBC, therefore, tried other sterilisation measures such as requiring commercial banks to open special deposit accounts with it, issuing central bank financial bonds, tightening the control over capital account transactions and ceasing high-cost foreign borrowings. It also implemented a series of measures aimed at encouraging capital outflows by easing restrictions on overseas investments by domestic companies, lowering ceilings and easing regulations on Chinese residents to take foreign currency abroad and allowing Hong Kong banks to offer personal renminbi accounts. International financial institutions have also been permitted to issue local currency RMB bonds in the domestic market.

More recently with external flows strengthening further, the PBC, effective April 22, 2003, started outright issue of its own bills with maturities up to one year. In 2003, base money injection of RMB 1146 billion yuan due to forex purchases was offset to the extent of RMB 269 billion yuan through open market operations. By the end of 2003, the PBC had made 63 issues of central bank bills, with a total issuance amount of RMB 723 billion yuan and outstanding amount of RMB 338 billion yuan. In the first half of the year 2004, PBC issued RMB 674.2 billion yuan of central bank bills. By end-June 2004, the outstanding balance of PBC bills had further increased to RMB 603 billion yuan (around US $ 73 billion). In the first half of 2004 PBC bills sterilised nearly one-half of the increase in its foreign exchange reserves.

OMOs have been supplemented with other policy measures. These include a two-step increase in reserve requirements from 6.0 per cent to 7.5 per cent between September 2003 and April 2004. In April 2004, China also took recourse to a differential reserve requirements system. Under this system, reserve requirements applied to financial institutions are dependent upon a number of criteria such as capital adequacy, asset quality and non-performing loans (NPLs). The lower the capital adequacy or the higher the NPLs, the higher the reserve requirement and *vice versa*. Other measures are : adoption of a floating rate system for central bank lending; using foreign exchange reserves to the extent of US $ 45 billion to inject capital into the Bank of China and the China Construction Bank. Moral suasion was intensified to guide credit orientation, improve credit structure and ensure the healthy development of the national economy.

These efforts have been able to contain broad money growth to an extent. The year on year growth rate of M2 fell to 16.2 per cent by end-June 2004 from 20.6 per cent a year back. Base money growth has, however, continued to remain in excess of that a year ago. More recently, effective October 2004, the PBC decided to raise the central bank benchmark rates for deposit and lending by 27 basis points each to, *inter alia,* build on the achievements of macro economic control.

episodes (out of 20 sample episodes), lending rates increased in 12 episodes as banks passed on the costs of reserve requirements to their customers. The limited effectiveness of reserve requirements in the face of a large non-bank financial sector was clearly illustrated in Korea during the episode of capital inflow surge in the early 1990s. The share of deposits held by banks fell from 70 per cent in 1970s to 36 per cent in 1992, partly on account of sterilisation measures and this reduced the intended efficacy of reserve requirements. Despite sterilisation measures, Korea still experienced a large degree of real appreciation (Spiegel, 1995).

Table 4.10: External Sector Indicators: China

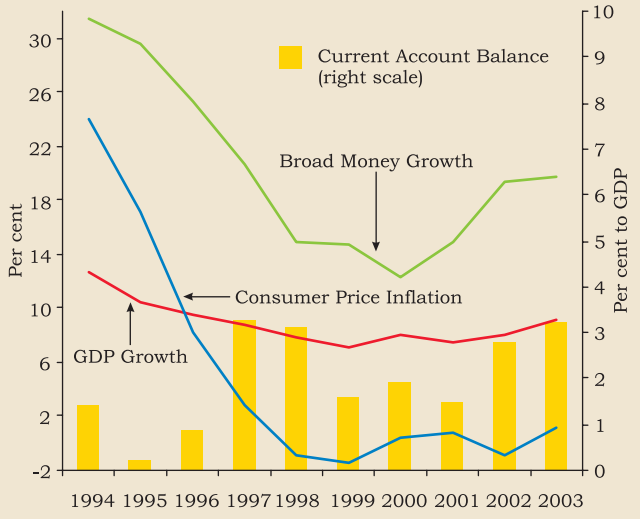
Year	Current Account Balance (US $ billion)	Change in Reserves (US $ billion)
1	2	3
1994	7.7	30.4
1995	1.6	22.0
1996	7.2	31.4
1997	37.0	35.0
1998	31.5	5.0
1999	15.7	9.8
2000	20.5	10.9
2001	17.4	46.6
2002	35.4	74.2
2003	45.9	116.9

Source: 1. World Economic Outlook, IMF, September (2004).
2. People's Bank of China website.

4.35 Empirical evidence suggests that reserve requirements may be effective in the short-run in reducing the volume of total capital inflows and may also help to lengthen the maturity composition of capital flows. The effectiveness may, however, get offset if higher reserve requirements induce more external borrowing as banks pass on the burden to their clients in the form of higher loan rates (Reinhart and Smith, 1998; Laurens and Cardoso, 1998, De Gregorio *et al*, 2000 and Montiel and Reinhart, 1999).

4.36 In order to moderate capital inflows, countries have also resorted to imposing or tightening prudential limits on banks' offshore borrowings and foreign exchange transactions (*e.g.* India, Indonesia, Malaysia and the Philippines).The Bank of Slovenia used

Chart IV.8 : China's Key Macroeconomic Indicators



Source : International Economic Trends, Federal Reserve Bank of St. Louis, July (2004).

reserve requirements specific to foreigners' deposits, introducing in 1994 a 40 per cent non-interest bearing reserve requirement on some foreign loans with a maturity of less than five years. In 1996, this was extended to cover maturities of up to seven years. In 1992, Mexico limited foreign currency liabilities of commercial banks to 10 per cent of their total loan portfolio. In January 1994, Malaysia imposed limits on non-trade related swap transactions on commercial banks. Taiwan put a ceiling on foreign holdings of domestic shares in 1994 and Malaysia limited foreigners' holdings of domestic bank deposits unless they were related to trade or physical investment. Malaysia also prohibited residents from selling short-term money market instruments to foreigners (Annex IV.1).

4.37 In the current episode of surge in capital inflows, Thailand announced measures to restrict short-term external capital inflows. Effective September 2003, financial institutions were allowed to borrow Baht from non-residents or engage in similar transactions without underlying trade or investment for amounts not exceeding 50 million Baht per entity only for contracts over 3 months. Recently, China allowed foreign institutional investors with at least $10 billion in assets to buy yuan-denominated stocks and bonds with a lock-in period of three years.

4.38 As regards the efficacy of capital controls and other prudential measures, empirical evidence suggests that these are unable to reduce the volume of capital flows (Montiel and Reinhart, 1999). The expected effect vanishes over time as market participants find ways to evade the controls. Alternatively, the effectiveness would require progressive widening of the scope of the controls with long-run costs which may outweigh the short-run benefits. Prudential measures are, however, able to alter the composition of capital inflows towards more durable components such as foreign direct investment. Capital controls, therefore, restrict volatile components of capital flows and lengthen the maturity of capital inflows. To that extent, by tilting the composition, controls could be useful as a step to reduce future vulnerability. But, since these do not reduce the overall volume of capital inflows, controls do not provide a higher degree of monetary independence (Edwards, 1999; 2004).

4.39 Shifting of public sector and government deposits from the commercial banks to the central bank and foreign exchange swaps also provide avenues for absorption of liquidity. Foreign exchange swaps - sale of foreign exchange by the central bank against domestic currency and a simultaneous

agreement to buy the same amount at a certain date in the future at the forward exchange rate – however, involve QFCs since such swaps might have to be done at a margin favourable to commercial banks. A few central banks have used standing deposit facilities (overnight/term) to absorb liquidity from the financial system.

4.40 If capital flows persist, the monetary policy instruments would need to be supplemented by other durable macroeconomic policies such as fiscal adjustment, liberalisation of trade policies and capital outflows, and finally, a greater degree of flexibility in the exchange rate. As regards liberalisation of capital outflows, Chile allowed pension funds to invest some of their assets abroad and liberalised investment outflows for selected private companies. Countries such as Taiwan and China have utilised forex assets for foreign direct investment abroad. Taiwan has allowed insurance companies to invest in foreign securities and domestic securities investment and trust companies to raise funds from the domestic market and invest in foreign securities under an aggregate ceiling. China has allowed domestic firms to retain forex earnings rather than surrender to the central bank. Several international financial institutions (IFIs) were allowed to issue local currency bonds in Taiwan and to use swap derivatives for remitting the funds abroad. During 2003, Thailand (i) permitted institutional investors to invest in overseas securities; (ii) encouraged mutual funds to invest on behalf of local residents in the Asian bonds issued by sovereign and quasi-sovereign entities; and (iii) increased the holding period of foreign currency deposits from 3 to 6 months. Efficacy of these measures, however, may be limited as such measures make the host country a more attractive place to invest and therefore, may induce greater inflows.

4.41 Fiscal policy can also be employed to reduce interest-sensitive capital inflows. A tightening of fiscal policy would reduce aggregate demand. This would, therefore, enable a reduction in domestic interest rates and thus help to reduce interest-sensitive component of capital inflows (Begg, 2001). Fiscal restraint as a policy response, however, is constrained by inflexibility of fiscal policy and is, therefore, relatively infrequently used. Within emerging economies, fiscal tightening as a deliberate attempt to manage capital flows during the 1990s was more evident in the East Asian economies *vis-à-vis* Latin America. More recently, Thailand has exhibited substantial fiscal correction.

4.42 As regards exchange rate response, cross-country experience shows that almost all countries allowed greater variability of the nominal exchange rate in the face of sustained capital inflows. In contrast to fiscal policy response, nominal exchange rate appreciation has been more common and larger in Latin America than in East Asia. Use of exchange rate as an instrument of sterilisation also has pitfalls. If nominal appreciation continues for a while, the resultant real appreciation could pose risk to external competitiveness (Lopez-Mejia, 1999).

4.43 The broad conclusions drawn from the foregoing analysis can be summed up thus. Countries faced with large capital inflows have attempted initially to sterilise while allowing some impact on monetary growth. Sterilisation is market based, but it is costly. It is useful if flows are short-term in nature. The danger is, however, that sterilisation may increase interest rates and this may continue to attract more capital. On the other hand, capital controls work against the market, but may be effective in smoothing volatility of inflows. If inflows persist, additional measures may have to be attempted, including a liberalisation of outflow controls, an adjustment or progressive increase in the flexibility of the exchange rate and a further strengthening of the prudential framework for the financial system (Table 4.11).

4.44 In sum, increased global integration implies that a national monetary policy that diverges from the consensus of policies pursued elsewhere elicits rapid capital flows and sharp exchange rate movements (Johnson, 2000). Increasingly, it is recognised that monetary policy cannot alter the movement of capital flows; it can only hope to fashion a credible response to its effects. In this, 'central banks must inoculate themselves against whimsy and keep their eyes on the fundamentals' (Blinder, 1998). Openness and, in particular, capital flows erode the control of the monetary authority over its monopoly - the monetary base - and reduces the credibility of money supply as an intermediate guideline for policy (Mboweni, 2002).

4.45 Thus, even though monetary policy is conducted exclusively for domestic goals, the international linkages have to be taken into account for policy formulation. More than ever before, the choice of monetary arrangements depends on the choices that other countries make (Meltzer, 1997). The structural changes associated with globalisation have led to a higher degree of uncertainty in the environment facing the monetary policy. Such changes have, for instance, loosened the association between output growth and inflation, thereby raising question marks

Table 4.11: Instruments for Managing Capital Inflows: A Cross - Country Survey

Country	Sterilised Intervention through OMOs	Central Bank Securities for OMOs	Deposits with Central Bank	Govern-ment Deposits	Withholding Tax/Tobin Tax/ Unremunerated Reserve Requirements	Liberali-sation of Capital Outflows	Reduction in Tariff Barriers	Increase in Reserve Requirements	Controls on Capital Inflows
1	2	3	4	5	6	7	8	9	10
Brazil	Yes				Yes				Yes
Chile	Yes	Yes			Yes	Yes	Yes	Yes	Yes
China	Yes	Yes	Yes			Yes		Yes	Yes
Colombia	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Indonesia	Yes	Yes	Yes	Yes		Yes	Yes		Yes
Korea	Yes	Yes				Yes	Yes	Yes	
Malaysia	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Mexico	Yes	Yes				Yes	Yes		Yes
Peru		Yes	Yes	Yes				Yes	
Philippines	Yes	Yes				Yes	Yes	Yes	Yes
Singapore			Yes	Yes					
Sri Lanka	Yes	Yes				Yes	Yes	Yes	Yes
Taiwan		Yes	Yes						
Thailand	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes

Sources : RBI, 2003d; Reinhart and Smith, 2001; Mezia, 1999; Hoggarth and Sterne, 1997; and, central bank websites.

on the existing well-tested economic relationships (Trichet, 2004). The uncertainty in regard to the current state of the economy (availability and interpretation of macroeconomic data/indicators) as well as the structure (the monetary transmission mechanism) is heightened *vis-à-vis* a closed economy framework. In an environment of such a heightened uncertainty, it is suggested that monetary policy response should be based on bounded discretion with no activism, smoothness, judgement, flexibility, pre-commitment, time consistency, transparency, and accountability (Solans, 2000).

4.46 The experience with capital flows has important lessons for the choice of the exchange rate regime. The advocacy for corner solutions - a fixed peg *a la* the currency board without monetary policy independence or a freely floating exchange rate retaining discretionary conduct of monetary policy - is distinctly on the decline. The weight of experience seems to be tilting in favour of intermediate regimes with country-specific features, without targets for the level of the exchange rate, the conduct of exchange market interventions to ensure orderly rate movements, and a combination of interest rates and exchange rate interventions to fight extreme market turbulence. In general, emerging market economies have accumulated massive foreign exchange reserves as a circuit-breaker for situations where unidirectional expectations become self-fulfilling. It is a combination of these strategies which will guide monetary authorities through the impossible trinity of a fixed exchange rate, open capital account and an independent monetary policy (Mohan, 2004a).

II. EXTERNAL SECTOR OPENNESS AND CONDUCT OF MONETARY POLICY : THE INDIAN EXPERIENCE

4.47 Structural reforms initiated in the Indian economy during the 1990s virtually encompassed all areas of the economy. At the same time, reforms were marked by a sense of gradualism (Mohan, 2004c). In regard to financial markets, a number of measures have been taken to widen, deepen and integrate various segments of the financial markets. These measures have imparted efficiency to the financial system and are expected to increase the efficacy of monetary policy signals to the real sector. At the same time, financial markets are often characterised by herd behaviour and contagion from abroad can be destabilising and lead to overshooting. Since the capacity of economic agents in developing economies to manage volatility is highly constrained, ensuring orderly conditions in various segments of the markets - money, debt, forex and credit markets - has been a key objective of monetary policy in India.

4.48 As a part of the reform process, widespread and extensive reforms in the external sector have transformed India from a relatively closed economy to a fairly open economy. In the external sector, as in other areas, India has followed a cautious approach to capital account convertibility, exchange rate management, and trade liberalisation. Careful monitoring of capital account transactions has been advocated to ensure an orderly process of

liberalisation and macroeconomic stability, with a view to maintaining sustainability of the balance of payments and overall macroeconomic stability. In particular, the Indian approach to exchange rate management has focussed on managing volatility.

4.49 External demand conditions, capital flows and exchange rates affect the Indian economy much more now than during the 1980s. Empirical evidence confirms that global business cycles have a relatively larger influence on the Indian economy than was the case during the 1980s and exports and industrial production have started exhibiting co-movement with global business cycles. Remittances and trade in services have further augmented the linkages between India and the rest of the world. As regards capital flows, although the period since 1993-94 has been largely marked by persistent surpluses in the balance of payments, the period also witnessed a number of shocks such as the Asian financial crisis, sanctions resulting from the nuclear explosions, credit rating downgrades and the bursting of the information technology bubble in the US. These episodes have had repercussions on capital flows and exchange rates. As discussed in Section I, swings in capital flows, exchange rates and external demand conditions affect not only output and inflation, but also impact upon banking and financial stability. More recently, the unprecedented volume of capital flows during 2003-04 threw new challenges for the conduct of monetary policy. Excessive capital flows can be inflationary as well as can lead to a surge in credit booms. In this milieu, while price stability remains a key objective, ensuring financial stability has also emerged as a key consideration in the conduct of monetary policy in India.

4.50 With the growing openness of the Indian economy, the conduct of monetary policy has undergone significant shifts in operating procedures, instruments and timing. In this regard, the year 1991-92 marks a threshold in the conduct of monetary policy. Sweeping changes in the environment in which it operates were brought on by the unprecedented balance of payments crisis of 1990-92. From being operated almost exclusively in a closed economy context, monetary policy had to contend with the pressures of the open economy dynamics. Three overarching features marked the transition:

(i) the exchange rate, which was hitherto administered, became market determined and ensuring orderly conditions in the foreign exchange market became an objective of exchange rate management;

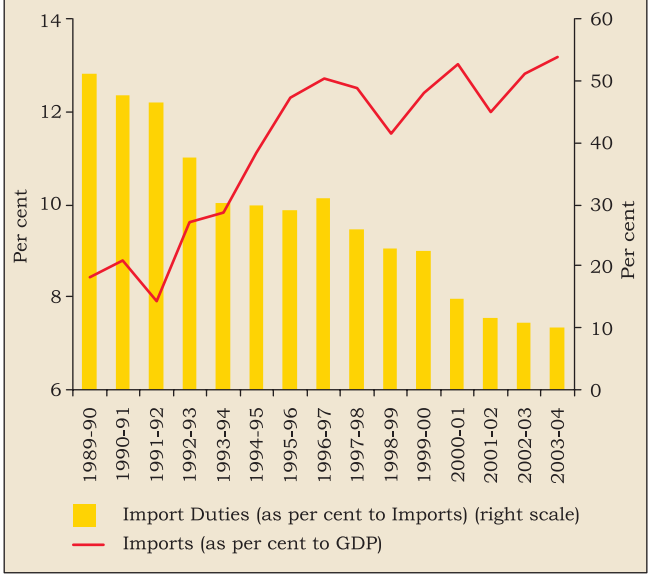
(ii) the vicissitudes in capital flows came to influence the conduct of monetary policy; and,

(iii) lessons of the balance of payments crisis highlighted the need to maintain adequate level of foreign exchange reserves and this in turn both enabled and constrained the conduct of monetary policy.

4.51 Initial conditions for the transformation were, in a sense, brought together by the response to the crisis in 1991-92 to achieve macro-economic stabilisation and structural adjustment. A two-step downward adjustment in the exchange rate of the rupee was effected in July 1991. This was accompanied by simultaneous tightening of monetary policy with increases in the Bank Rate, deposit and lending rates and refinance rates. Along with the exchange rate adjustment, significant structural reforms were effected in trade policy so as to liberalise the system from administrative controls and licences. On the trade front, tariffs were reduced sharply and quotas have been phased out. The peak rate of customs duty has declined from 150 per cent in 1991-92 to 20 per cent in 2004-05. The openness of the economy - merchandise exports and imports as a proportion of GDP - has increased significantly from 15 per cent in 1990-91 to 24 per cent by 2003-04 (Chart IV.9). A more striking feature has been the opening up of the economy to financial flows - direct as well as portfolio investment flows and debt flows.

4.52 Since 1991, there has been a continuous move towards integration of the Indian economy with the world economy. During this continuum of reforms,

Chart IV.9 : Indicators of Openness

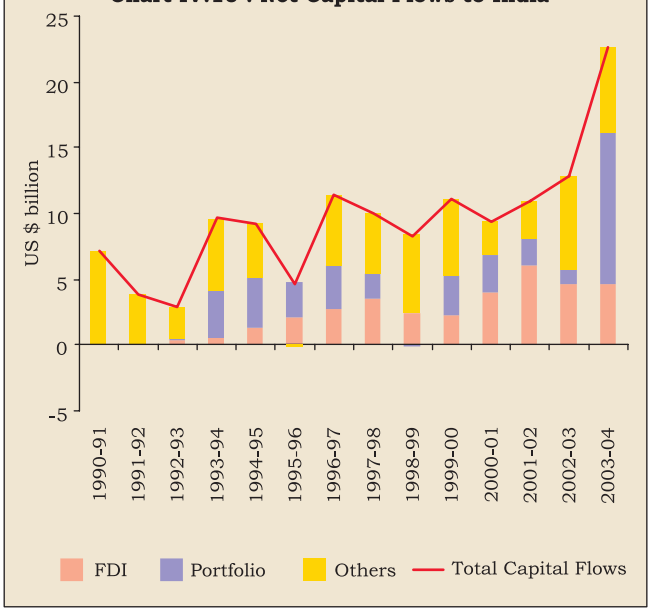


four distinct phases are clearly discernible in terms of the underlying balance of payments conditions, shifts in monetary conditions and the policy responses. These are briefly discussed in the following paragraphs.

4.53 The first phase - the period 1993-95 - was characterised by strong capital inflows accompanied with stability in the exchange rate. During this period, foreign investment inflows - in particular, portfolio investment inflows in the form of foreign institutional investors' (FII) inflows and global depository receipts (GDRs) - increased sharply. Net portfolio inflows increased from negligible levels to more than US $ 3 billion in each of the two years (Chart IV.10). Coupled with curtailment of the current account deficit, there were large overall surpluses in the balance of payments and this led to a significant increase in foreign exchange reserves from their extremely low levels of the crisis period. During this period, the rupee witnessed a remarkable stability *vis-a-vis* the US dollar. The Reserve Bank's passive intervention was motivated by the need to protect export competitiveness by preventing an appreciation of the rupee which would in any case have been against fundamentals (RBI,1994).

4.54 Large accretions to the foreign exchange reserves led to a transformation in the composition of the Reserve Bank's balance sheet and, hence the dynamics of the money supply process. In contrast to the trend of the 1980s, net foreign exchange assets emerged as a key driver of reserve money. As capital flows continued, a number of steps were undertaken

Chart IV.10 : Net Capital Flows to India



to sterilise the monetary impact of capital flows. In the second half of 1993-94, indirect instruments of monetary policy were activated and the Reserve Bank undertook large open market sales of Government securities from its portfolio. Nonetheless, increase in monetary aggregates was higher than that anticipated and excess liquidity led to inflationary pressures in the economy. With average inflation rate at 10.9 per cent during 1994-95, a package of measures was undertaken to sterilise the impact of external flows. These included an increase in the cash reserve ratio and a reduction in export refinance limits. The deceleration in capital inflows in the latter half of 1994-95 reduced the strain on sterilisation of capital inflows and consequently open market operations remained subdued in 1994-95.

4.55 The second phase - the year 1995-96 - was characterised by a deceleration in capital inflows and a widening of the current account deficit. There was a turnaround in the foreign exchange market and the prolonged stability in the exchange rate of the rupee witnessed from March 1993 came under stress in the second half of 1995-96. In response to the upheavals, the Reserve Bank intervened in the market to signal that the fundamentals are in place and to ensure that market correction of the overvalued exchange rate was orderly and calibrated. Exchange market intervention by the Reserve Bank in the spot market was initially supported by a withdrawal of liquidity from the money market to prevent speculative attacks on the exchange rate. These measures were successful in ensuring an orderly correction in the overvaluation of the rupee.

4.56 The third phase - 1996-2001- witnessed return of capital inflows. Although each of the year in this period was characterised by an overall surplus in the balance of payments, the phase was also marked with a few episodes, *albeit* brief, of heightened volatility in capital flows. The volatility was on account of both international and domestic factors - the Asian financial crisis, the spread of contagion to other markets such as Russia and Brazil, border tensions and sanctions imposed after the nuclear tests. This necessitated policy initiatives to manage the volatility in capital inflows, including monetary measures (such as increases in the Bank Rate, the repo rate and the cash reserve ratio), sales of foreign currency in the market to meet temporary demand-supply mismatches and administrative measures (Annex IV.2). Monetary measures were temporary, often reversed within a period of 2-3 months, consistent with the policy objective of ensuring orderly conditions. Recourse was