Capital Flows and Central Banking: The Indian Experience[1]

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1. Introduction

How do emerging countries' central banks handle spillovers from monetary policy in advanced economies or from volatile capital flows? In particular, how do they allocate the burden of policy across monetary policy, exchange rate, reserve management, or capital flow measures?

Emerging market economies have traditionally been wary of excessive volatility in their exchange rates, and have tended to either peg their exchange rates or maintain defacto managed floats. Their reluctance to allow the exchange rates to be determined freely by markets, termed as the "fear of floating", has been attributed to their net open foreign positions. Unable to raise external debt in domestic currency (the so called "original sin"), emerging markets have held debts denominated in foreign currency, implying that exchange rate depreciations inflict adverse balance sheet effects.[2] Countries thus often tailor their monetary policy to cushion the impact of capital flows on exchange rates. Due to capital flows to emerging markets generally being procyclical, they have tended to loosen the monetary policy during periods of high economic growth (to resist exchange rates appreciation) and tighten it during economic slowdowns (to moderate the extent of exchange rate depreciation).[3]

This scenario has changed somewhat in the last one and a half decades. After a series of high profile currency crises in the mid-1990s-early 2000s, many emerging markets have moved from pegged exchange rate regimes to floating exchange rates. They maintain less negative foreign currency positions, and have built a larger stock of reserves to limit the impact of large reversals of capital flows and modulate excessive volatility in their exchange rates. An increasing number of central banks now operate under an inflation targeting framework, which accords them the mandate to formulate monetary policy to primarily meet domestic policy imperatives, and in many cases to conduct countercyclical monetary policy. All these developments have somewhat insulated the monetary policy in emerging economies from external concerns, but not fully.

In addition, it has been widely observed that capital flows to emerging economies are driven more by global liquidity conditions than domestic economic conditions. As such, emerging markets receive capital flows in bunches. There are periods of surges when countries receive large capital flows in a short period of time, which in turn fuel domestic credit booms and asset price inflation. Surges are eventually followed by reversals of capital, when credit has to be quickly unwound as well. Thus, financial stability issues are intricately

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[2] For a discussion of "fear of floating" see Calvo and Reinhart (2002), and for a discussion of "original sin" see Eichengreen, Hausmann and Panizza (2007).

[3] Procyclical capital flows and procyclical monetary policies result in amplified business cycles in emerging markets, leading to what is known as the "when it rains it pours" phenomenon. See Kaminsky, Reinhart and Vegh (2004) for evidence on procyclical capital flows, monetary policy and fiscal policy. They show that capital flows are procyclical across countries at all levels of income; fiscal policy is procyclical in developing and middle income countries; and the procyclicality of monetary policy is most pronounced in middle income countries.

linked with the capital flow cycles. Even if the currency mismatch and balance sheet concerns may have subsided over time, financial sector stability concerns remain as relevant and require appropriate response to capital flows. This response has tended to take the form of countercyclical macro prudential measures as well as capital flow measures.

The Indian experience has evolved in sync with the experience of other emerging markets. Its exchange rate, which was largely pegged to the US dollar until the early 1990s, has increasingly become more market determined. Consistent with trends elsewhere, India has been liberalizing its capital flow steadily, and has become more financially integrated. Reflecting the broad global trends, capital flows to India have been subject to both surges and sudden stops of capital flows.[4] And just like in the other emerging countries, India too has built a large buffer of external reserves and for the most part has used it to modulate excessive fluctuations in the exchange rate.

This paper looks at the extent to which India's monetary policy has been affected by capital flow cycles. In the post liberalization period since the early 1990s, capital flows have evolved in three phases—a first phase from early 1990s-early 2000s, during which capital flows increased steadily but remained modest compared to the size of the economy or monetary aggregates; a second phase of "surge" from early 2000s-2007-08, when inflows increased rapidly in some years, outpacing GDP or monetary aggregates; and a third period of stops and volatility, starting in 2008-2009 when capital flows reversed in the post Lehman Brothers period and again during the tapering tantrum and remained volatile.

While monetary policy mostly focused on price stability during the first phase, it was also impacted by the capital flow cycle in the later phases. Monetary outcomes were eased during the period of surge and tightened during the stop episodes. The full policy response to capital flows included reserve management, liquidity management and capital flow measures. Specifically, India increased money supply, accumulated reserves, sterilizing them partially, accelerated the pace of liberalization of capital outflows, and slowed the pace of further liberalization of inflows during the "capital surge" episode of 2003-2008. It tightened monetary policy, used reserves to deter large exchange rate depreciation or volatility, and increased the pace of liberalization of inflows, while restraining outflows, during the reversal of capital in 2008-09 and in 2013.[5]

Going forward, the new inflation targeting framework is likely to further reinforce the "domestic orientation" in monetary policy. At the same time due to a progressively liberalized capital account over the last two and a half decades, the scope to actively use capital flow measures seems rather limited. Thus in years ahead, reserve management and macroprudential measures are likely to play a more significant role in helping respond to

[4] See Ghosh et al (2012a) on surges of capital flows and Forbes and Warnock (2012a) on sudden stops of capital flows.

[5] See Basu, Eichengreen and Gupta (2015) for a discussion of the policy response in India during the tapering talk episode in May 2013.

capital flow cycles, just as the policy makers and the economy develop greater tolerance for exchange rate adjustments.

The rest of the paper is organized as follows. Section 2 discusses the experience of emerging market economies in handling volatile capital flows. Section 3 puts the Indian experience in perspective. Section 4 elaborates the response of monetary policy to capital flows in India. Section 5 discusses the capital flow measures that India has deployed in response to capital flow cycles, and Section 6 concludes.

2. The experience of emerging market economies with monetary policy, capital flows, exchange rate and reserve management

Emerging market economies' policy space is said to be governed by an "impossible trinity," or what is also knows as a policy "trilemma". The constraint that countries face is that they can typically choose only two out of the following three objectives—an independent monetary policy, stable exchange rate, or full capital account mobility. A country e.g. can have fully autonomous monetary policy if it either imposes restrictions on its capital account, or does not strive for exchange rate stability. While in the 1980s and 1990s countries navigated this trilemma by fixing their exchange rates, and pursuing a monetary policy which was committed to a large extent to maintaining the exchange rate; a large number of countries since the early 2000s have moved to more flexible exchange rates and are able to pursue more independent monetary policy.

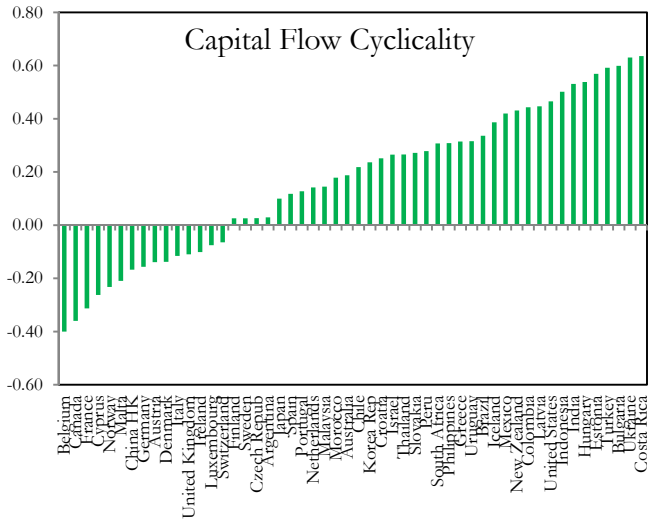
Aizenmann et al (2013) constructed the "trilemma index" for a large number of countries to measure the extent to which countries tradeoff between the three policy goals of monetary independence, exchange rate stability, and financial integration. Tracing the policy configuration of countries over time, they make some interesting observations. Since the early 2000s, a growing number of developing countries have opted for greater financial integration, more monetary policy autonomy and somewhat greater flexibility in exchange rate. Countries have however not abandoned exchange rate stability fully, instead retaining an intermediate level of stability. One factor which has facilitated the emerging countries to manage their policy space in this specific way is an increase in the level of reserves that they hold. Indeed the ratio of international reserves to GDP has increased dramatically across emerging market economies—from about 10 percent in 1990 to nearly 25 percent in recent years. A higher reserve level has allowed countries to better integrate financially while also stabilizing their exchange rates and not losing their monetary autonomy completely.

This evolution of policy choices across emerging countries has been noted in several contemporary papers (see Cordella and Gupta, 2015). The impact of financial integration on monetary policy and exchange rate in particular has been discussed in the context of procyclical capital flows. It has been pointed out that the capital flows to emerging markets have traditionally been procyclical—emerging countries receive larger capital flows during periods of high economic growth, which increase the demand for their currency, and

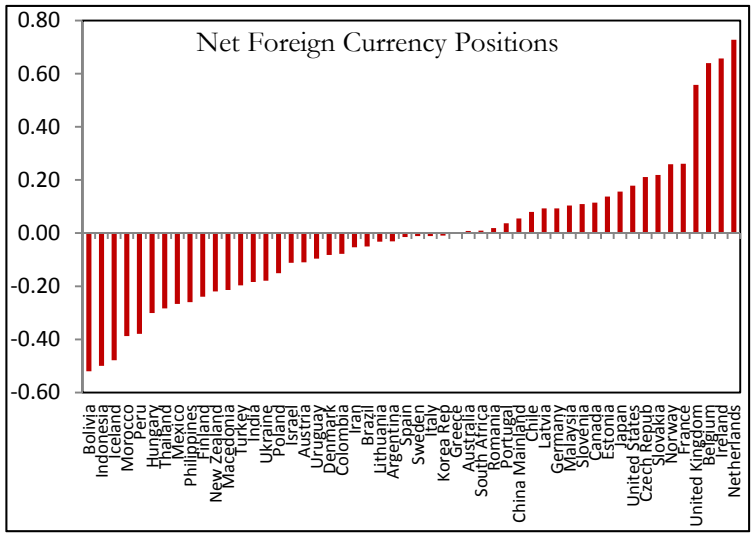
appreciate their exchange rate (Figure 1, Panel A). The converse is true during the periods of slow economic growth--capital flows slow down or reverse and the exchange rate depreciates. Since emerging economies hold liabilities denominated in foreign currency (Figure 1, Panel B), they are short in foreign currency and resist currency depreciation to limit valuation losses. The confluence of these factors is that the emerging countries have traditionally pursued procyclical monetary policy to resist the depreciation of their exchange rates, by tightening it when GDP growth is low, and loosening it when GDP growth is high.[6] In emerging market economies, the exchange rate appreciates when GDP growth is high and depreciates when GDP growth is low; and this correlation is stronger in countries which receive procyclical capital flows, (Figure 1, Panel C); the countries with procyclical capital flows are the ones more likely to pursue procyclical monetary policy, (Figure 1, Panel D).[7]

Figure 1: Emerging economies monetary policies seem to have been influenced in the past by procyclical capital flows and negative Foreign Currency Positions

A. Emerging markets receive procyclical capital flows



B. They maintain negative net foreign currency positions (data are for 1995)

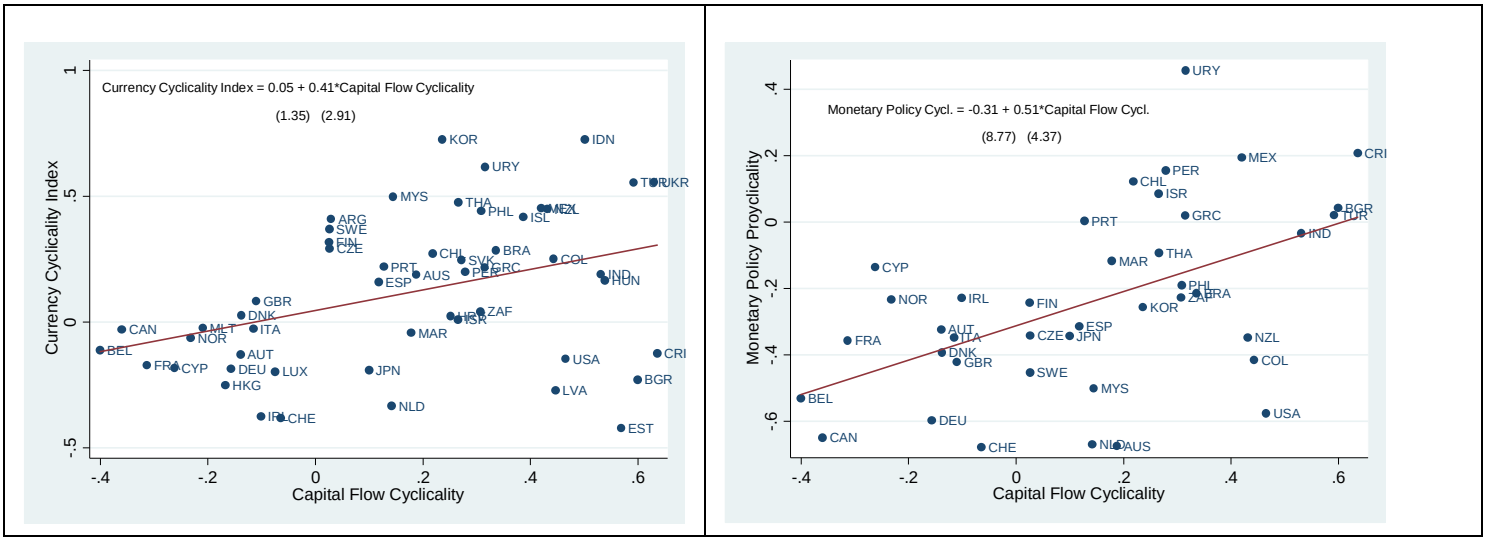


C. Capital flows influence the cyclical co-movement of exchange rate and GDP

D. Countries receiving procyclical capital flows pursue procyclical monetary policy

[6] See Ghate et al (2013) for evidence on procyclical monetary policy in India in the post reform period, attributed to procyclical capital flows and managed exchange rate.

[7] Examples abound from emerging countries, especially those with open capital accounts and flexible exchange rate regimes, where similar experiences have been observed. E.g., as noted in Calvo and Reinhart (2002), in the aftermath of the Russian crisis in August 1998, Chile and Mexico increased their interest rates to limit exchange rate depreciation despite a marked slowdown in their economies.



Note: Procyclicality of capital flows is calculated as the correlation between the cyclical components of quarterly GDP and private net capital inflow. The currency cyclicality index is computed as the coefficient of correlation between the cyclical components of GDP and exchange rates, where the cyclical components are deviations from the trends for quarterly data for 62 countries from 1975, q1 to 2013, q1. Cyclicality of monetary policy is calculated as the correlation between the cyclical components of GDP and short-term interest rates; monetary policy stance is considered to be procyclical if the interest rates are high during the periods of low economic growth. Data on net foreign currency position is from Benetrix, Lane, and Shambaugh (2014), and refers to 1995.

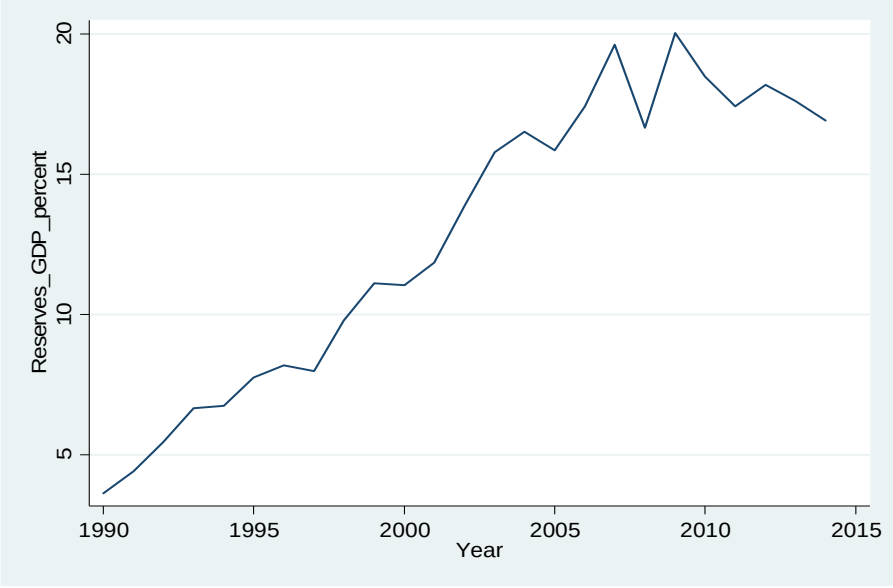
In recent years however emerging economies appear to be making a transition from procyclical monetary policy to countercyclical monetary policy. The evidence points at the consistently improved net foreign exchange position of emerging economies--countries have reduced the mismatch in their external balance sheets (Figure 2), due to improved current account positions, larger foreign reserves (figure 3), shift in the composition of capital flows to equity from debt; and the success in developing local currency debt markets. Aizenmann et al (2015) particularly emphasize the role of larger reserve holdings of the emerging countries for this shift in the policy orientation of emerging countries.[8] A move to inflation targeting could be another reason for this transition, as noted in McGettigan et al (2013). Evidence therein shows that the countries that have successfully transitioned to countercyclical monetary policy are the ones which have adopted an inflation targeting framework, possibly reflecting strengthened monetary institutions allowing them to pursue independent monetary policy. Cordella and Gupta (2015) corroborate these findings, and in addition note that in recent years, monetary policy in emerging market economies is influenced less by exchange rate movements, and more by economic growth.

[8] See Lane and Shambaugh (2010) for trends in the foreign currency position of emerging countries. Aizenman et al (2015) document the increase in the international reserves held by emerging markets since the early 2000s, attributing it to insure against volatile capital flows, mercantilist motive for specific countries, and possibly even to a regional demonstration effect—a country may gather reserves to keep up with the other countries in the region, termed as the "keeping up with the Joneses" effect.

Figure 2: Net Foreign Currency Positions have improved in Emerging Economies

Note: Data on net foreign currency position is from Benetrix, Lane, and Shambaugh (2014). The median is calculated for 33 emerging markets included in Cordella and Gupta (2015), wherein more details are provided. Details on the index.

Figure 3: Emerging Economies have accumulated Reserves.



An alternative view is provided by Rey (2015), by pointing out that the scale of financial globalization, and in particular the role of global banks in mediating capital flows from advanced economies to emerging economies, has restricted the choice set available to emerging countries even further. It argues that financial integration has allowed the monetary policy of advanced economies to be transmitted to emerging economies. The

latter, losing the option to pursue independent monetary policy, only face a dilemma and not a trilemma—they can either have unhindered capital flows or independent monetary policy. In order to pursue independent monetary policy, countries need to either manage their capital account directly or via countercyclical macroprudential measures. It dismisses international monetary policy coordination on practical grounds--advanced economies are unlikely to consider anything but domestic policy consideration in formulating their monetary policies.[9]

3. Capital Flows, Exchange Rates, and Reserve Management in India

The Indian experience is broadly consistent with the emerging market trends discussed above. India maintained a fixed exchange rate regime, a relatively closed capital account and a financially repressed financial sector until the early 1990s. Due to low financial integration with the global economy India was largely insulated from external shocks during this period. Monetary policy was thus geared towards maintaining price stability and supporting growth. Nevertheless, large fiscal and current account deficits, and dwindling external reserves culminated in a balance of payments crisis in 1991, when India had to negotiate an IMF program. Sweeping structural reforms were introduced as part of the "conditionality" of the program, which subsequently acquired a momentum of their own and continued even after the program was over. One of the reforms undertaken was to transition from a pegged exchange rate regime to a more flexible one; and another to gradually open the economy to international capital flows. External reserves were accumulated for most of the post liberalization period to keep up with increasing external liabilities.

Capital flows were liberalized starting in the early 1990s, and since then various restrictions on capital inflows have been eased steadily over time. The limit on FDI in specific sectors has been raised and completely removed in several sectors; portfolio equity flows have been liberalized; the ceiling on foreign investment in government debt has been increased from $1 billion in 1998 to 30 billion in 2013; and the limit on corporate debt has been increased from $ ½ billion in 1998 to 51 billion in 2013.[10]

Besides, firm specific as well as sectoral limits on the share of portfolio equity have been raised, from 24 percent in 1992 to 49 percent in 2001 and later up to the sectoral limit on the exposure to overall foreign equity investment. The amounts that Indian corporates can borrow abroad have been increased, while the maximum rate at which these borrowings

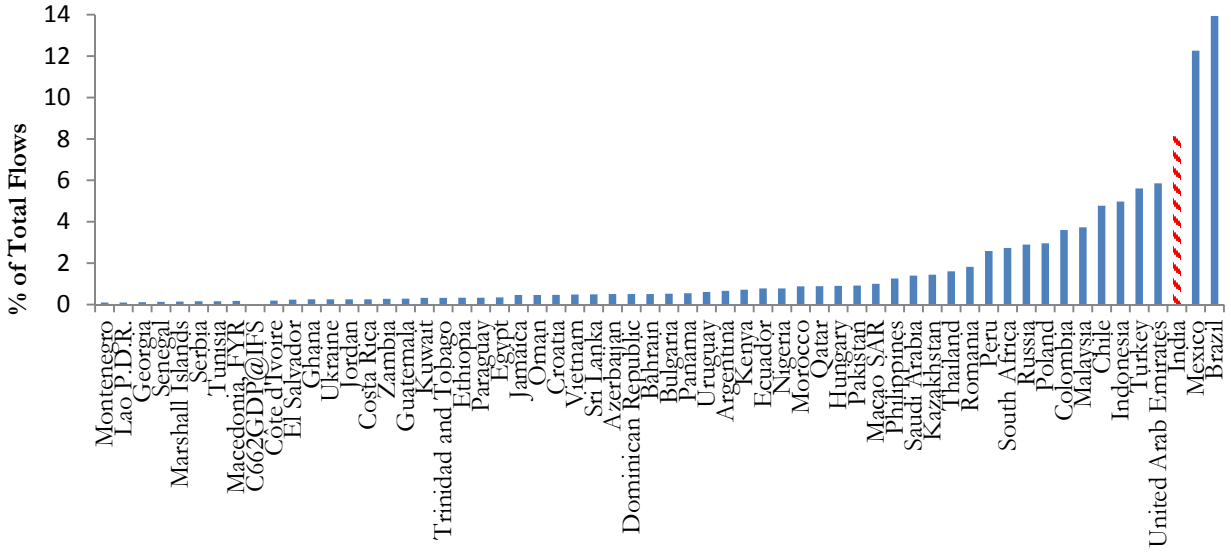
[9] See Korinek and Sandri (2014), Claessens et al (2013) on the use of macroprudential measures or capital controls in order to modulate the impact of capital flows on credit growth, and thereby reclaim the monetary policy independence.

[10] Subsequently in September 2015, the RBI announced to increase the limit on FPI investment in government securities to 5% of the outstanding stock by March 2018. This measure is expected to generate additional inflows of $17 billion.

can be raised have been relaxed. Limits on capital outflows by individuals and firms have been liberalized as well.

As a result of the steady relaxation of capital inflows and outflows, India has rapidly become more financially integrated, Figure 4. It is currently one of the largest recipients of private capital flows in the emerging world, and on average attracts about 8 percent of private capital flows and loans to the emerging countries (excluding China, which attracts almost a third of total private capital flows to all emerging markets).[11]

Figure 4: Allocation of Private Capital Flows (equity, bonds and loans) across Emerging Markets, 2014 (% of flows to all emerging markets excluding China)

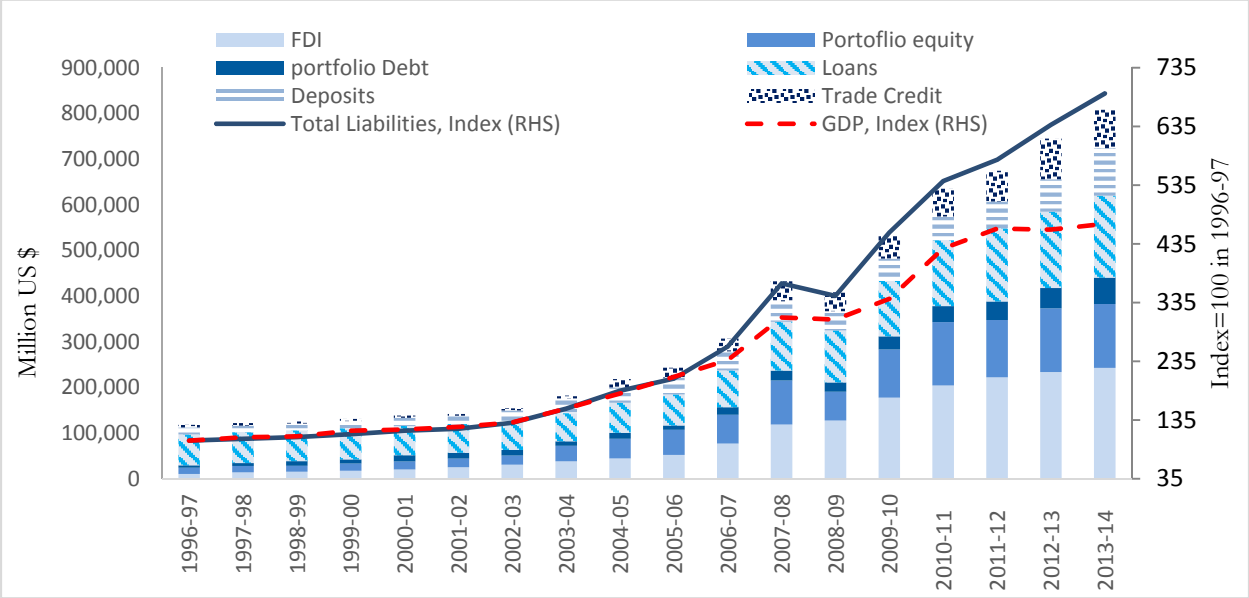


Source: Global Financial Stability Report, IMF, 2015

Capital inflows to India are comprised of FDI, portfolio debt and equity flows, corporate borrowing abroad (called external commercial borrowings or ECB), and deposits held by Indian diaspora in the Indian banks (known as non-resident Indian deposits or NRI deposits). As a result of continued capital inflows, the stock of external liabilities has increased rapidly, far outpacing the size of the economy. The balance of liabilities has tilted in favor of equity liabilities over time, the share of which has increased from about one-fifth in the mid-1990s to about half in recent years, Figure 5.

[11] Though among the largest in absolute terms, India does not rank as high for capital inflows in proportion to GDP.

Figure 5: Total External Liabilities have built up in India, outpacing GDP; while its composition has tilted towards equity



Source: RBI Handbook of Statistics on the Indian Economy; World Development Indicators, World Bank. Capital flows refer to net capital flows.

Indeed this large exposure to foreign capital has also rendered India vulnerable to external shocks, as e.g. was the case during the tapering tantrum of summer 2013, when India was among the most affected countries. Eichengreen and Gupta (2014) analyzed the impact of the Fed's tapering talk on exchange rates, foreign reserves and equity prices in emerging markets between April-August 2013. They established that an important determinant of the impact across emerging markets was the volume of capital flows that countries received in prior years and the size of their local financial markets. Countries receiving larger inflows of capital and with larger and liquid financial markets experienced more pressure on their exchange rates, reserves, and equity prices once the Fed's "tapering talk" began. Since India ranked high in terms of the size and liquidity of its financial markets, and in the extent of capital flows it received in prior years, it was an easy target for investors seeking to rebalance away from emerging markets.

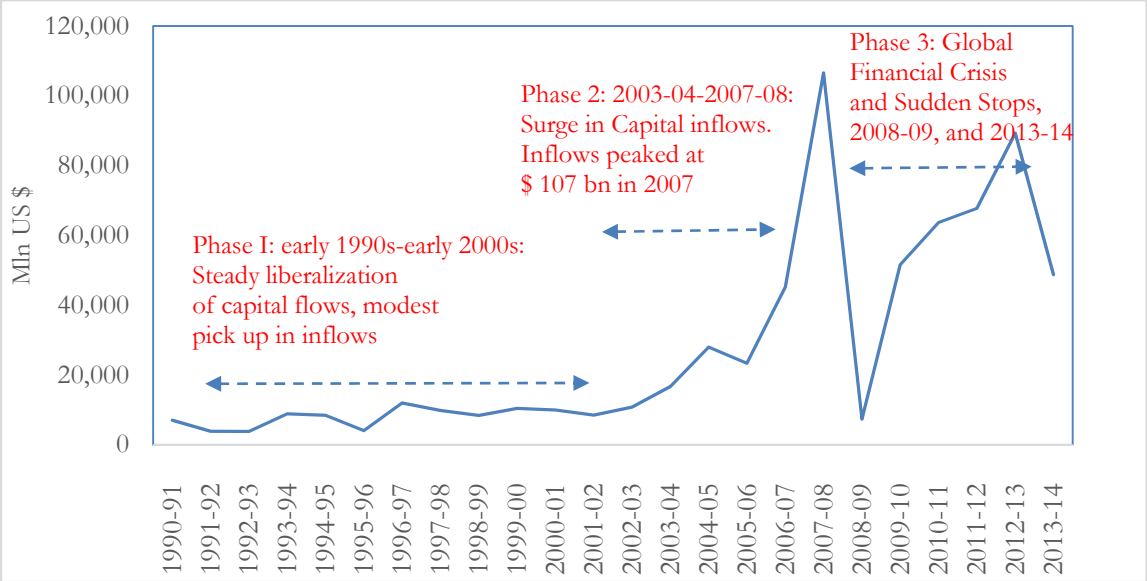
3.1 Three phases of Capital Flows to India are evident since the early 1990s, which includes a surge-and-stop cycle

For easy narration, we divide the post liberalization period in India into three phases. A first phase, lasting for about a decade from the early 1990s until early 2000s, is best described as one of modest capital inflows and a managed exchange rate. The exchange rate was devalued twice in the early 1990s and was later floated, but it continued to be defacto managed. The pace of capital inflows doubled during this period, from an average of nearly $5 billion a year in the early 1990s, to $10 billion a year by the early 2000s. The stock of

reserves, which had dwindled to $5 billion prior to the 1991 crisis, was enhanced to about $75 billion by the early 2000s. For most of this period monetary policy was broadly set in sync with domestic considerations.

A second phase can be said to last from 2003-04 to 2007-08, when India experienced a surge in capital flows. The surge reflected prominently in all components of capital inflows—portfolio flows, FDI flows and other flows, Figure 5. Capital inflows accelerated to an average $ 44 billion a year in the five years between 2003 and 2007, compared to an average of 10 billion in three prior years, and at its peak in 2007-08 exceeded $ 100 billion in one year, Figure 6. A sudden stop in 2008-2009, when capital flows declined precipitously to $ 7 billion, then started the third phase, the genesis of which can be traced to the collapse of Lehman Brothers. Capital flows, particularly portfolio and other flows, fluctuated sharply in subsequent years.[12] Another bout of capital outflows and volatility was evident during the "tapering talk" episode in 2013q3.[13] The discussion below is organized around these three phases of the capital flow cycle.

Figure 6: A Surge and Stop Capital flow Cycle was evident in India starting in the early 2000s



Source: RBI Handbook of Statistics on the Indian Economy. Capital flows refer to net capital flows.

[12] Using methodology standard in the literature, using quarterly data we identify 2008q3-2009q2 as the period of a sudden stop. The criteria used is similar to that in Forbes and Warnock (2012b) wherein a sudden stop is identified if inflows fall one standard deviation below the average of previous 20 quarters for at least consecutive two quarters; and if in at least one quarter, flows fall two standard deviations below the prior years' average.

[13] However, since this event lasted only for a quarter, it does not qualify as a sudden stop as per the standard criteria used in the literature, which require the reversal of capital flows to last more than a quarter.

Figure 7: Capital Flows to India follow the same broad trend as flows to emerging markets starting in the early 2000s

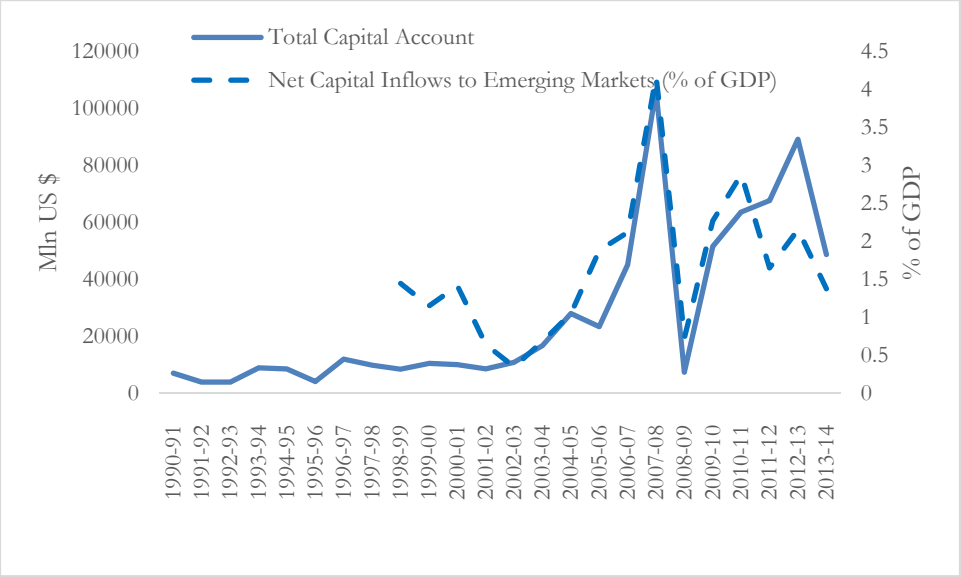
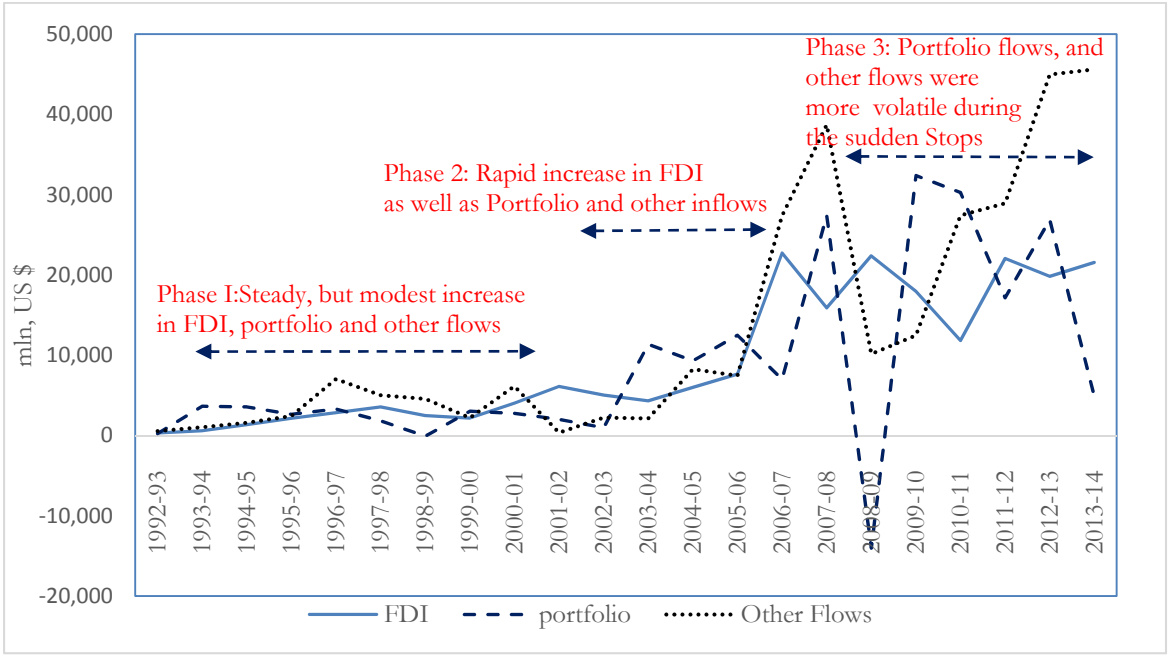


Figure 8: Portfolio, FDI and Other inflows all accelerated during the "Surge", Portfolio and Other Flows have been rather volatile since 2009

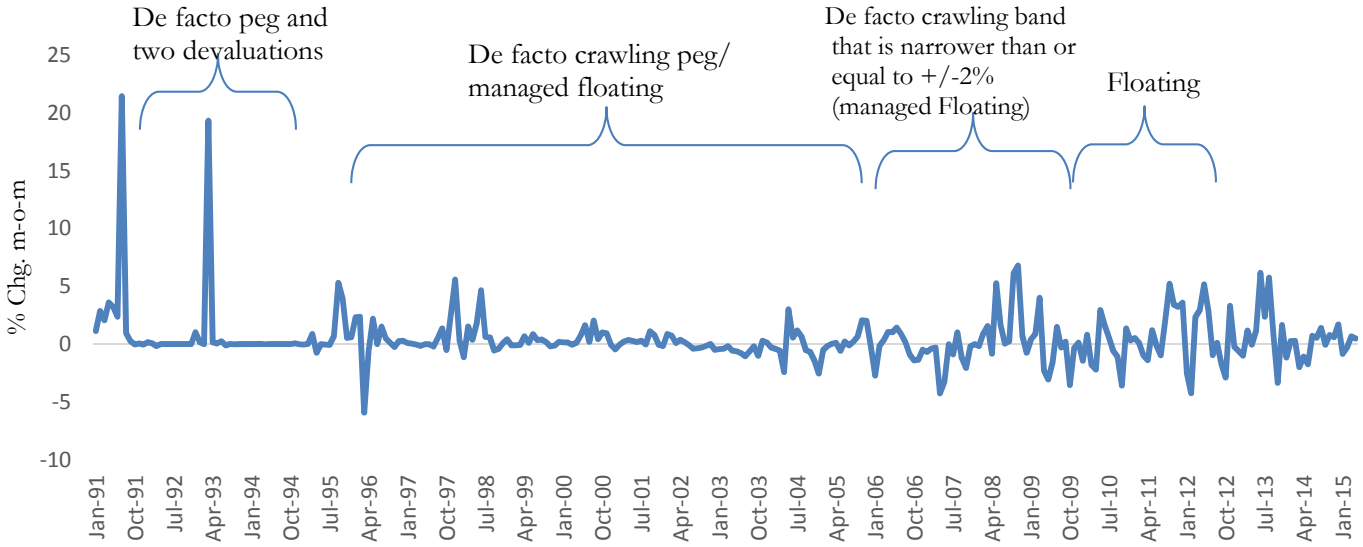


Note: Other flows include NRI deposits, ECB and short term credit; portfolio flows include equity and debt flows. Capital flows refer to net capital flows. Source is RBI's Handbook of Statistics on the Indian Economy

3.2 Exchange rate Management in India since the early 1990s—a steady move towards more flexibility

India's exchange rate regime has become progressively more flexible over time. After the breakdown of the Bretton Woods System in 1971, the rupee was initially pegged to the pound sterling, and then from 1975 with a basket of currencies. Following the balance of payments crisis in 1991 the exchange rate was depreciated twice in quick succession, by 9 per cent and 11 per cent on July 1, 1991 and July 3, 1991 and was floated subsequently. Even though officially the exchange rate was floated in 1993, in practice it continued to be managed. As per the Reinhart and Rogoff's defacto classification of exchange rates, as well as the IMF's classification, India's exchange rate is broadly characterized as a pegged or managed float from the early 1990s until late 2000s, and as floating since 2010, Appendix Table 1. Increased flexibility of India's exchange rate regime over time is confirmed in monthly percent changes in Figure 9 below as well as in higher frequency data (which we have not presented here for brevity).

Figure 9: Monthly percent change in Nominal Exchange Rate confirm defacto Managed Float until late 2000s, and increased flexibility since 2008

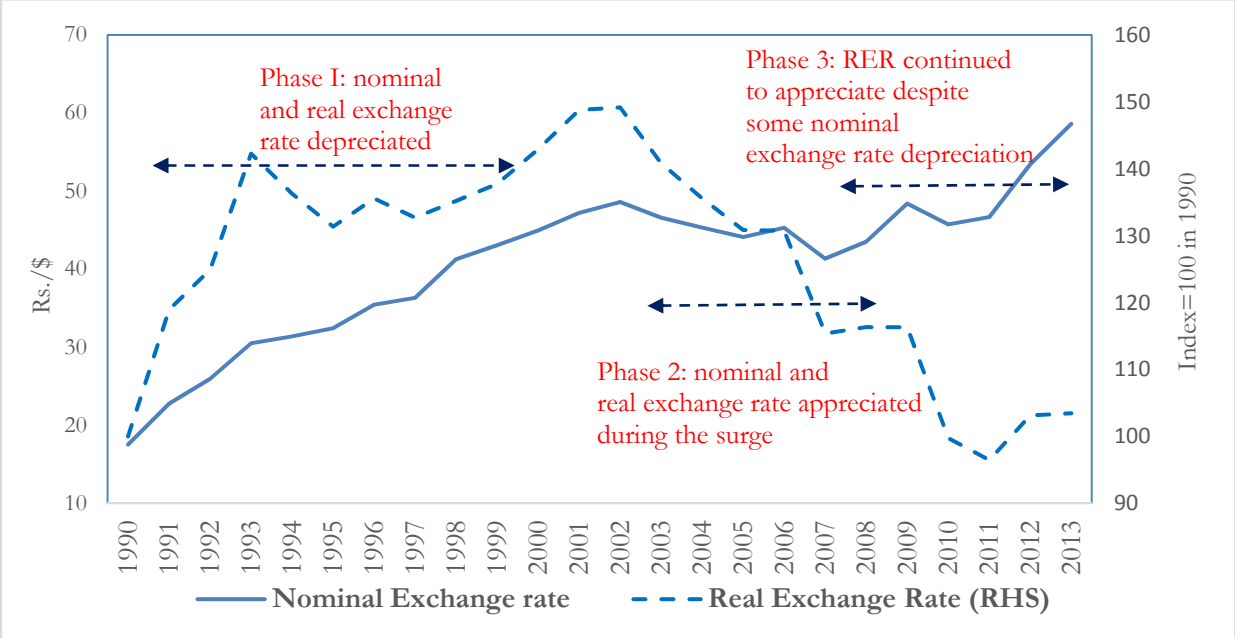


Source: RBI Handbook of Statistics on the Indian Economy

Looking at the movement in exchange rate across the three phases of capital flows, the nominal exchange rate depreciated during the 1990s, more than offsetting the impact of inflation on the real exchange rate, which depreciated as well. Subsequently, during the capital surge phase, even as the burden of maintaining the exchange rate shifted to reserves, the nominal exchange rate appreciated mildly. With inflation running high as well, this reflected in a sharp appreciation in the real exchange rate. The nominal exchange rate then depreciated starting in 2008-09, but not sufficiently to offset the impact of high inflation on

the real exchange rate. As inflation picked up during this period, the real exchange rate continued to appreciate.[14]

Figure 10: Trends in Nominal and Real Exchange Rate



Note: Both nominal and real exchange rate are with respect to US $, and are defined such that an increase is depreciation. Source is RBI's Handbook of Statistics on the Indian Economy

3.3 Reserve Management—the level of reserves has increased for the most part, in keeping with increased external liabilities

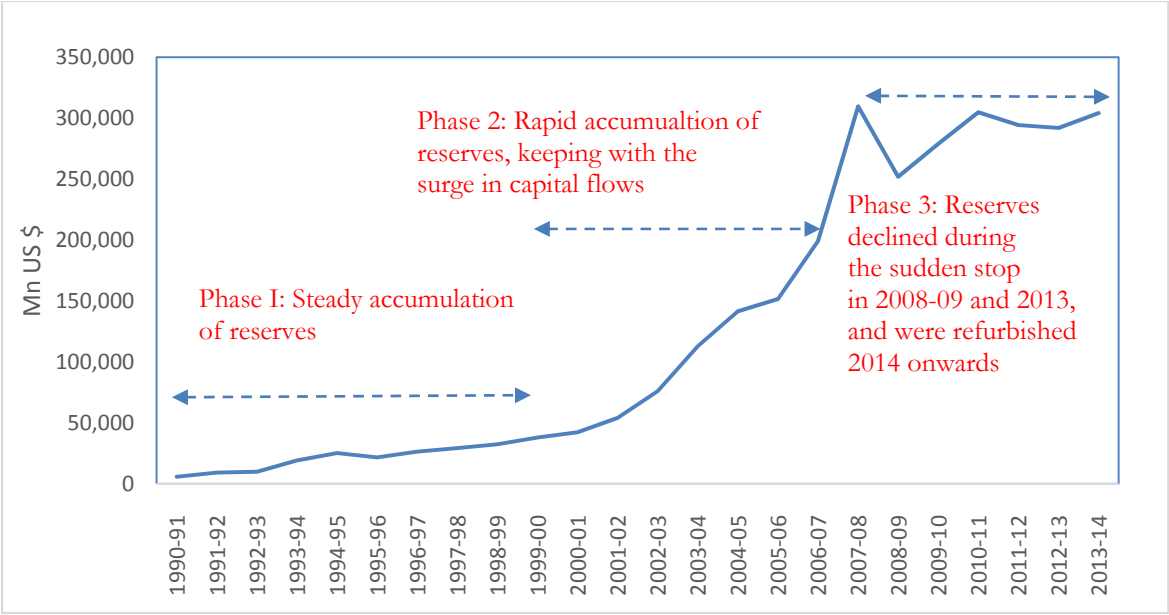
Emerging markets hold reserves for a variety of reasons--mercantilism, insurance against shocks to their current and capital accounts, as an indicator of external solvency, and to use it to stabilize the exchange rate. While in the 1980s and 1990s countries held reserves mainly to defend the level of their exchange rate or to insure against shocks to the current account, insuring against capital account shocks has become a more important motive in the last two decades. Thus, it is perhaps unsurprising, that keeping up with the increased volume of capital flows, the average reserve holding in emerging markets increased sharply in the last four decades, from about 5 percent of GDP in the 1980s to 25 percent in 2010s (Ghosh, Ostry and Tsangarides, 2012b; Aizenman et al, 2013).

India too has accumulated reserves over time, Figure 11. During the early 1990s-early 2000s, the stock of reserves increased at a measured pace keeping with moderate volume of capital flows. It was followed by a sharp accretion of reserves during the period of rapid

[14] Basu et al. (2015), and Joshi (2013) attribute the increase in current account deficit during this period to the loss of exchange rate competitiveness.

capital flows, when reserves increased from $76 billion in 2002-03 to $310 billion in 2007-08.[15] Reserves then declined to $250 billion in 2008-09, due to capital flow reversals after the collapse of Lehman Brothers. Reserves were rebuilt to some $300 billion during 2009-2011, but only to the level last seen before the collapse of Lehman Brothers, at which level they were then maintained in subsequent years. Basu et al (2015) indicate no attempts to increase the reserve coverage further during this period of heightened vulnerability to external shocks, while providing a narrower room to intervene in the foreign exchange market. A corollary being that exchange rate volatility increased during this period (as highlighted in Figure 9).

Figure 11: The Stock of External Reserves increased in Tandem with Capital Flows until 2008, but remained Stagnant in 2009-2013



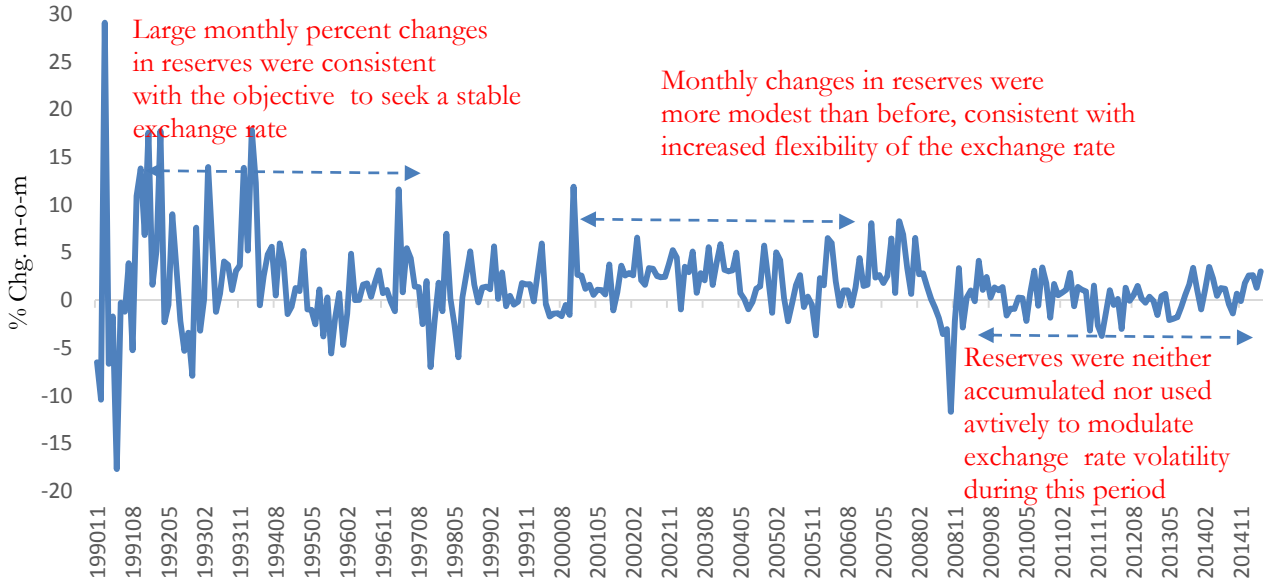
Note: Reserve assets comprise foreign exchange assets (currency, deposits, securities and financial derivatives), monetary gold, SDR holdings, reserve position in the IMF and other claims (loans and other financial instruments). Source is RBI's Handbook of Statistics on the Indian Economy

The inclination to use reserves to modulate exchange rate volatility seems to have evolved in India since the early 1990s and is mirrored in the volatility of the exchange rate, Figure 12. While the monthly percent change in reserves were larger in the 1990s, consistent with observed exchange rate stability in the 1990s, the use of reserves declined in the 2000s continuing until 2013. The policy towards building reserves or to use them to modulate excessive exchange rate volatility that prevailed during 2009-2013, seems to have reversed

[15] The issue of optimal level of reserves for India, whether India was holding excess reserves, and whether they adversely impacted growth was vigorously debated in the mid-2000s, see Joshi and Sanyal (2004).

after the tapering talk episode.[16] Reserve accumulation has picked up again since 2014, and as of end April 2015, reserves were at an all-time high of about $ 350 billion.

Figure 12: Monthly percent change in Reserves



Note: calculated using data from Bloomberg.

How reserve management affects money supply, interest rates and the real economy depends on whether they are sterilized or not. Sterilized intervention by keeping money supply unchanged is unlikely to have an impact on interest rates, investment and growth; but imposes the cost of sterilization on the central bank or the government—known as the quasi fiscal deficit in some parlance. Non-sterilized intervention on the other hand increases money supply, drives the interest rates lower and may have a positive impact on investment on one hand and generate the tendency for the economy to overheat on the other. India has for most part in the past partially, but not fully, sterilized its reserve accumulation.

Looking broadly at the decomposition of reserve accumulation into sterilized and non-sterilized components since 1991, the RBI partially sterilized the accumulation of reserves (through open-market operations as well as increasing the cash reserve ratio). This is

[16] One might argue that the increased volatility of the exchange rate is a global phenomenon, and afflicted all emerging markets post 2008. Basu et al (2015) calculated measures of volatility for a number of emerging countries, and observed that besides India no other country experienced a similar increase in volatility. Empirical evidence shows that high exchange rate volatility can distort investment decisions and affect long-term growth, especially in countries with low levels of financial development (see Serven, 2003 and Aghion et al., 2009).

reflected in a decline in the stock of domestic assets with the RBI. The extent of sterilization increased so much in wake of large capital inflows that by end 2003 the RBI had completely exhausted its stock of domestic assets. The government had to create new "market stabilization bonds" in March, 2004 that could be sold by the RBI (Joshi and Sanyal, 2004). Despite being significant, the sterilization was not 100 percent. Increase in reserves was associated with an increase in reserve money supply, Figure 13. In order to look at the unsterilized part of the reserve intervention we regress log reserve money on nominal GDP—since the demand for money is closely related to nominal economic growth. The excessive money supply is then attributed to the unsterilized reserve intervention by the RBI, Figure 14.

Figure 13: Increase in Reserves in early 2000s was partially sterilized as reflected in a decline in net domestic assets

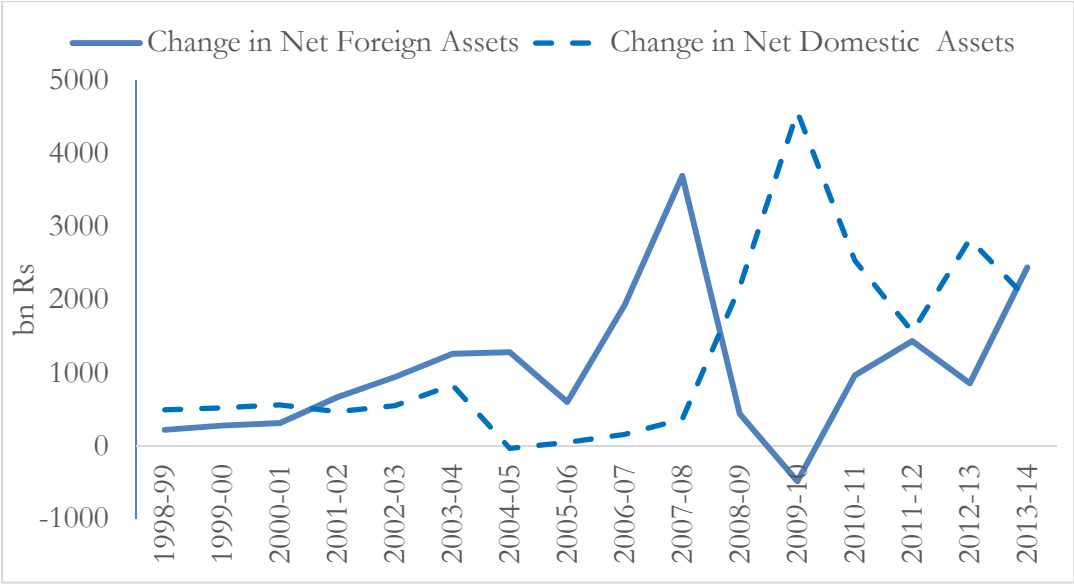
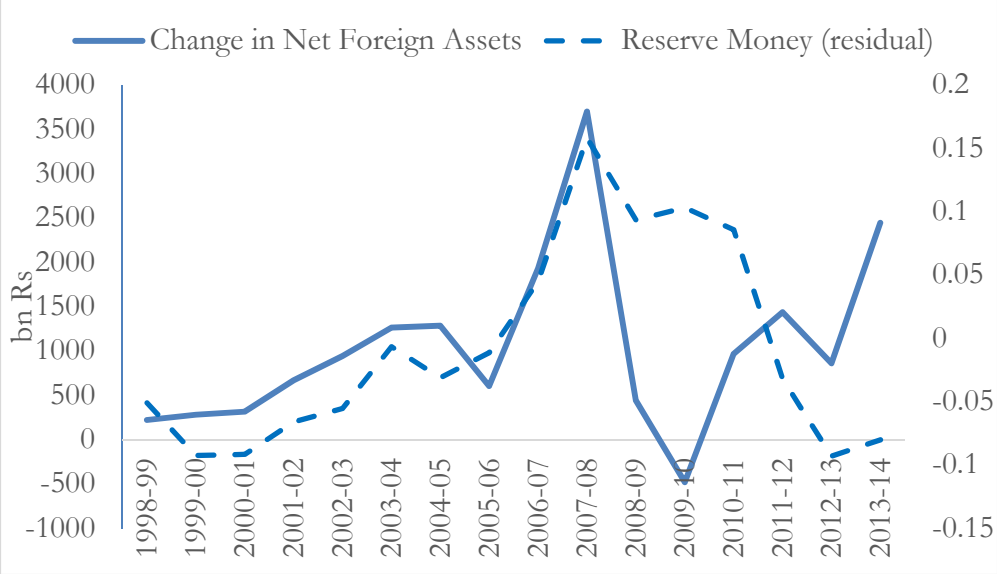


Figure 14: Increase in Reserves in early 2000s was not sterilized fully as reflected in an increase in reserve money, after accounting for growth in nominal GDP



Note: reserve money series (right axis) is the residual money supply after regressing log reserve money on log nominal GDP.

3.4 Monetary Policy Framework

The major factors influencing monetary policy as well as the instruments of monetary policy have evolved in India.[17] The policy was primarily driven by the financing need of the government until the early 1980s. Besides fiscal dominance, financial repression, in the form of high Statutory Liquidity Requirement (SLR) and Cash Reserve Ratio (CRR), interest rate regulations and directed credit to various sectors limited the availability of credit to the private sector. The policy framework changed in the late 1980s, when price stability was formally accepted as the dominant objective of monetary policy, and a range of 5-7 percent was adopted as the target range for inflation. In the monetary framework from the mid-1980s until the late 1990s, described as "monetary targeting with feedback", broad money supply was to be used as the monetary aggregate, to be set in line with projected GDP growth and inflation target. The move to this framework coincided with wider financial sector reforms--interest rates were initially rationalized and subsequently deregulated completely; and the automatic monetization of fiscal deficits was phased out in 1994-97.

[17] See Mohan and Kapur (2009) and Patra and Kapur (2012) for a discussion of the evolution of monetary policy in India, from where I have drawn here as well.

Another major change in the framework was ushered starting in the mid-late 1990s when interest rates progressively became the main instrument of monetary policy. The bank rate was used as the principal policy rate until 2002, and the reverse repo rate provided the floor for the call money rate. This was followed by a Liquidity Adjustment Facility (LAF) as the operating framework of monetary policy in 2004 wherein the repo rate provided the upper bound of the policy interest rate corridor, while the reverse repo rate provided the lower bound. The operating framework was modified again in 2011, when repo rate was made the only rate to transmit the policy, and reverse repo continued as the lower bound; but a new Marginal Standing Facility (MSF) was introduced under which banks could borrow overnight from the RBI up to one per cent of their net demand and time liabilities (NDTL) at 100 basis points above the repo rate to meet unanticipated liquidity shocks.[18]

The Government of India and the RBI signed an inflation targeting framework as the new guiding framework for monetary policy on February 20, 2015. The framework, based on the recommendation of the Urjit Patel Committee Report (submitted in January 2014), is expected to enhance the credibility of monetary policy and anchor inflationary expectations. As per this framework, the RBI would adhere to a "flexible inflation target", and strive to attain a CPI inflation target below 6.0 percent by January 2016 and a target of 4 percent, within a band of (+/-) 2 percent around it, by the end of fiscal year 2017-18. The objective of monetary policy is set to "primarily maintain price stability while keeping in mind the objective of growth". The agreement with the government requires the RBI to bring out a document every six months explaining the sources of inflation and providing inflation forecast for the following 6-18 months.

It further ascribed that the RBI would be deemed to have missed its target if inflation exceeds more than 6.0 percent for three straight quarters in 2015-16 and all subsequent years; or if inflation is below 2.0 percent for three straight quarters in 2016-17 and all subsequent years. If the RBI is thus deemed to have failed to meet the target, it would have to send a report to the government citing the reasons, propose remedial actions to be taken by the RBI, as well as an estimate of the time period within which it would expect the target to be achieved after implementing the proposed remedial actions.

Further changes in the liquidity management framework were introduced in September 2014 to coincide with the move to inflation targeting framework as per the recommendations of an expert committee (RBI, 2014).[19] The committee recommended that rather than focusing mainly on the overnight segment of the money market through overnight repos for liquidity management, it should conduct its liquidity management primarily through term repos of different tenors. Some of the key changes in LAF included ending unlimited accommodation of liquidity needs at the fixed LAF repo rate; provision of

[18] As for the objectives of monetary policy, the RBI stated them to be price stability, growth, and financial stability.

[19] See Patra et al (2016), Chapter X in this volume for details.

the predominant portion of central bank liquidity through term repo auctions; fine tuning operations through repo/reverse repo auctions of maturities varying from intra-day to 28 days; the main liquidity provision instrument - 14-day term repo rate - synchronized with the reserve maintenance period, allowing market participants to hold central bank liquidity for a relatively longer period; and progressive reduction of statutory pre-emptions through the SLR.

The earlier LAF consistently faced the conflict between its monetary policy function or liquidity provision, which often would demand opposite stance, as well as fiscal dominance. As discussed at length in the Patel committee report, either directly or indirectly the government financing needs would be met by the RBI conducting open market operations.[20]

Another concern has been weak transmission of monetary policy. This primarily happens due to banks not being a great conduit of interest rate transmission, specifically the public sector banks. The transmission has been considered particularly weak in transmitting interest rates cuts as compared to the interest rate hikes. Another reason for weak transmission is a large informal financial sector, where the interest rate at which transactions happen are several times the interest rates in the formal financial sector. These are unlikely to be affected by changes in the policy rates at the margin. These are the issues that are debated actively in the Indian monetary policy context.

4. Monetary Policy Reaction Function—Domestic policy objectives of price stability and growth have been the most important influences on policy interest rates

In practice what does monetary policy in India react to? Most existing studies which have estimated the monetary policy reaction function for India find inflation and the output gap to be the major influences on policy rates, with some variation in relative quantitative estimates across studies and over time.[21]

Mohanty and Klau (2004) estimate an open economy Taylor rule for India (as well as for a few other emerging market economies) during 1995-2002 and found the relationship between short term interest rate and inflation as well as between interest rates and the output gap to be statistically significant; and the relationship to be somewhat stronger for the output gap. Consistent with these results, in Hutchison et al (2010) coefficients of output and

[20] It was partly because of RBI managing both government's debt as well as conducting its monetary policy. One belief is that the separation of the debt management office from the RBI would likely make the monetary policy more autonomous (see RBI, Patel).

[21] See Mohanty and Klau (2004), Hutchison et al (2010), Singh (2010), Verma and Prakash (2011) and Patra and Kapur (2012), among others.

inflation are significant in the estimates of reaction function over 1980-2008; the coefficient of output is more significant than inflation. Patra and Kapur (2012) estimate several different models using data for 1996-2011 and found that even though the quantitative results are specific to the estimated model, both inflation and the output gap are significant in the policy reaction functions.

Studies using longer time series data show the relative importance of inflation and the output gap in policy reaction function has evolved over time. Singh (2010) e.g. shows the output gap to have a larger influence on monetary policy until the 1980s, and the effect of inflation to be stronger in the following two decades. Mohanty (2013) also finds the impact of inflation to be stronger than that of the output gap (and the latter to be statistically insignificant) during a more recent period, 2000-01 to 2012-13.

How may concerns related to exchange rate or capital flows affect monetary policy in an emerging country? As discussed in Section 2, capital inflows usually cause exchange rate appreciation and capital outflows result in exchange rate depreciation. Central banks in order to resist these exchange rate movements, may lower the policy rates to deflect capital inflows and raise them to deter outflows. In addition, central banks may buy foreign exchange to build its reserve cover or to avoid exchange rate appreciation during capital inflows or sell them during outflows, but may choose not to sterilize them fully. Thus the monetary stance often becomes expansionary during capital inflows and contractionary during outflows.

Has monetary policy in India been affected by issues related to capital flows? The evidence is more tenuous on the impact of exchange rate or capital flows on monetary policy in India. Mohanty and Klau (2004) find changes in policy rates to be correlated with exchange rate in India as well as other emerging markets, highlighting the support for the "fear of floating" hypothesis. Additionally, they find the response of policy rates to the exchange rate to be larger than that to inflation or the output gap.[22] Hutchison et al. (2013) estimate the monetary policy rule in India at different times over the 1987–2008 period. They show that external considerations influenced RBI policy over the sample period—taking the form of responding to exchange rate depreciation (appreciation) by raising (lowering) the interest rate. Patra and Kapur (2012) find exchange rates to be broadly insignificant, and to only have a lagged impact on money supply, but not on policy rates.[23]

In our own analysis we correlate reserve money supply (total reserve money supply as well as reserve money in circulation held by public), broad money supply (M3), and the

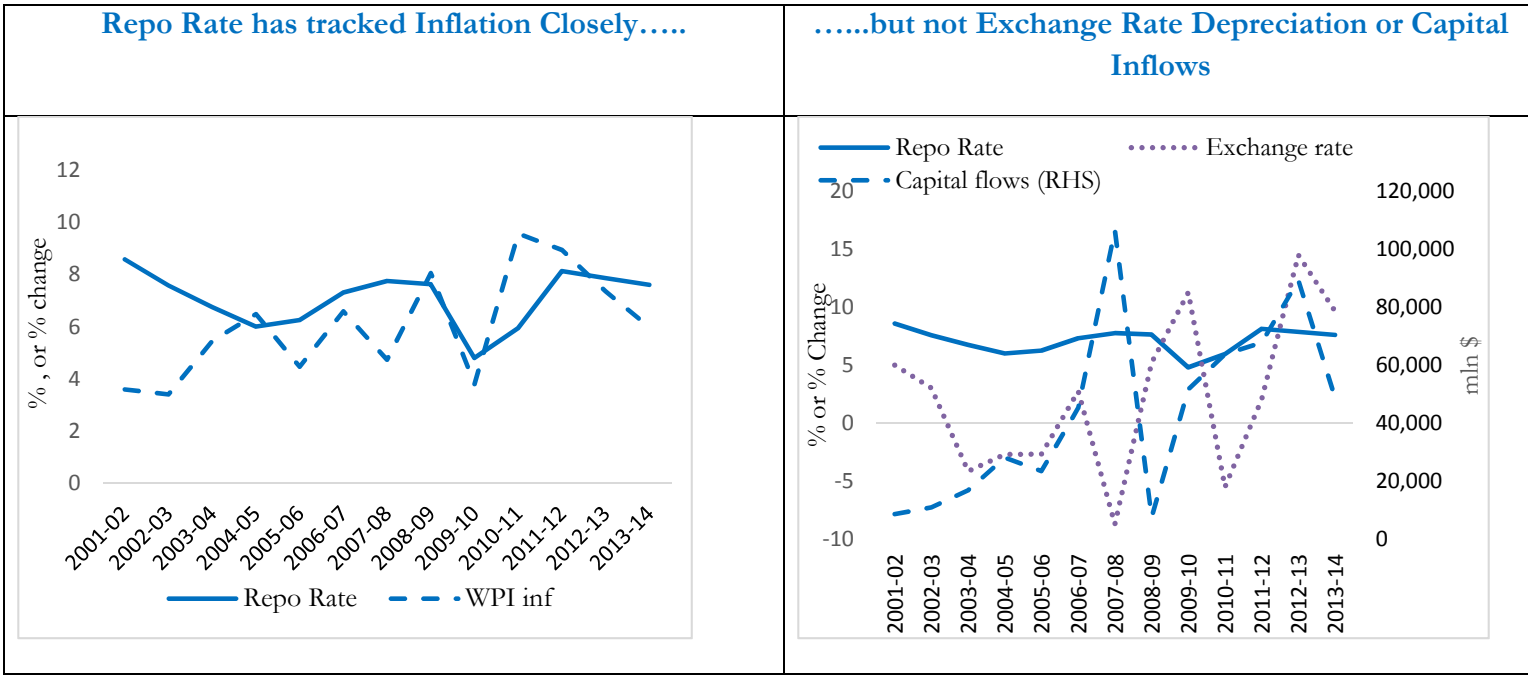
[22] They also indicate an interesting asymmetry in some countries in that the central bank's response to a negative inflation shock is weaker than to a positive shock.

[23] Taking a different tack in a RBI working paper, Verma and Prakash (2011) find capital inflows to be unresponsive to the interest rate differential, and conclude that the policy rates may primarily focus on domestic inflation and growth objectives, and the response to the magnitude and composition of capital flows may well be through other instruments.

repo rate with capital inflows and exchange rate movements.[24] We focus on the period from early 2000, since this is the period from when capital inflows have the potential of being an important influence on monetary policy, and since it also coincides with the period when repo rate started to be used as the policy rate.[25] We compare the policy response during the pre-surge period with that during the surge period as well as during the stops. We estimate simple regressions, in which we control for the impact of GDP growth or inflation (WPI inflation being the relevant inflation series during this period) on monetary outcomes (the policy interest rate or money supply).

Our results indicate two regularities. First, domestic policy priorities take precedence over exchange rate or capital flows in the setting of policy interest rates-- we find the policy rate to be correlated positively with inflation but not ordinarily with capital flows or exchange rate depreciation, Figure 15.

Figure 15: Policy Repo Rate seems to have tracked Inflation closely, but not exchange rate depreciation or capital flows



Source: RBI Handbook of Statistics on the Indian Economy

Second, the policy response to surges and stops consists of reserve management, liquidity management, and capital flow measures. The "domestic orientation" in monetary

[24]Mohan and Kapur caution that in analyzing the growth in reserve money supply, one needs to adjust for changes in the CRR. An increase in CRR, even as it impounds excess liquidity from the banking system, ends up showing a larger expansion in reserve money in the Reserve Bank's balance sheet.

[25] During the 1990s bank rate as well as money supply tracked domestic inflation closely.

policy was tested during the period of capital surge in 2003-2008. During the surge episode, unprecedented large inflows of capital were associated with an acceleration in money supply. The statistics in Table 1 below confirm the policy approach to surges. The Reserve Bank of India, confronted with large capital inflows, accumulated reserves, and initially sterilized capital inflows by way of open market operations. However it did not sterilize the entire impact of its reserve accumulation, because of the finite stock of government securities it held, which it could use for this purpose. Thus it signed a Memorandum of Understanding with the Government of India in 2004 for issuance of Treasury Bills and dated Government Securities under the Market Stabilization Scheme (MSS), and used it to absorb liquidity. Due to the partial sterilization of reserve accumulation, both narrow and broad money supply increased during the surge; the extent of which increased in the later years of the surge (also see Figure 16).

While policy interest rates in India have not ordinarily reacted to the surges and stops of capital flows, some monetary accommodation seems to have occurred through changes in money supply during 2003-2008. Besides the open market operations and market stabilization scheme, the cash reserve ratio was used to neutralize the expansionary impact of foreign exchange purchases on domestic monetary and liquidity conditions.[26] Policy interest rates increased during the surge, due to a spike in inflation during this period.[27]

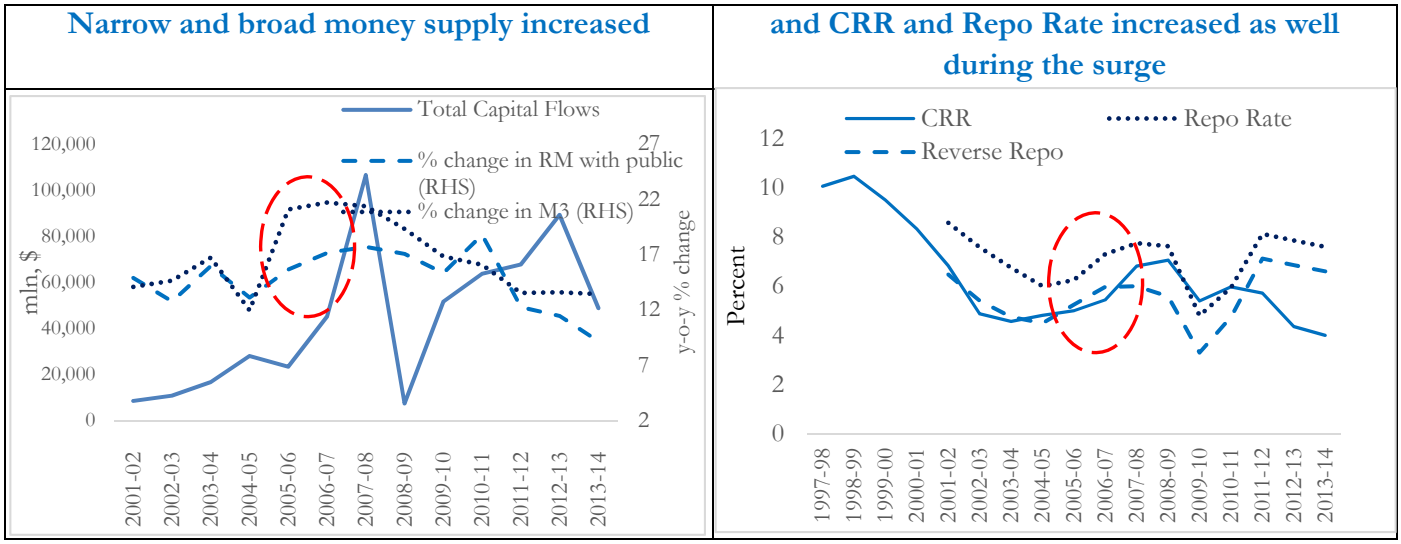
Table 1: Money Supply and Policy Rates during Capital Flow Surge
(Annual averages over the period indicated)

	Reserves change ($ bn)	Exchange rate (% change)+	Reserve Money growth (% change)	Reserve Money in circulation with public (% change)	M3 growth (% change)	Policy Rate: Repo/Reverse Repo/MSF Rate	CRR
Pre surge 2000-01-2002-03	12.7	3.96	9.6	12.8	15.2	8.08*	6.7
Surge first three years: 2003-04, 2004-05, 2005-06	25	-3.3	15.8	14.9	16.6	6.3	4.8
Surge last two years: 2006-07, 2007-08	79	-3.5	27.4	17.4	21.5	7.53	6.1

Note:* Average over 2001-02 and 2002-03. + a positive change is depreciation.
Source: RBI Handbook of Statistics on the Indian Economy

[26] The increase in CRR was reflected in a much larger increase in reserve money that the RBI issued, but a smaller increase in reserve money in circulation that was held by people.
[27] The episode reversed the steady decline in CRR and policy rates that started in the 1990s as a part of the broader financial liberalization.

Figure 16: A Multipronged approach was used during the capital surge in mid 2000s which included an increase in CRR and policy rate but also resulted in some increase in money supply



Source: RBI Handbook of Statistics on the Indian Economy

The increase in money supply is also evident in quarterly data. In Table 2, using data from 2000-2007, we regress measures of money supply for a dummy for surge years, alternatively takes value 1 for years 2005-2007, or 2006 and 2007. Results show an acceleration in money supply, which picked up in the later years of the surge. It was most pronounced in reserve money supply but less so in the reserve money in circulation and in broad money supply, due to the increase in the CRR. The acceleration is evident even after controlling for GDP growth in the regressions in Table 2.

Table 2: Money Supply during Capital Flow Surge (Quarterly data from 2000-2007)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variables →	% growth in reserve money supply	% growth in reserve money supply	% growth in reserve money supply in circulation with public	% growth in reserve money supply in circulation with public	% growth in broad money supply (M3)	% growth in broad money supply (M3)
Surge dummy =1 for 2005, 2006, 2007	9.15***		2.31***		3.36***	
	[6.80]		[3.03]		[3.91]	
Surge dummy =1 for 2006 and 2007		10.17***		3.02***		5.20***
		[6.70]		[3.76]		[7.38]
Constant	10.72***	11.60***	12.82***	12.93***	15.12***	15.1***
	[13.0]	[15.3]	[27.5]	[32.2]	[28.7]	[42.8]
Observations	32	32	32	32	32	32
Adj. R-squared	0.59	0.59	0.21	0.30	0.32	0.63

4.1 Handling Sudden Stops in India: The role of monetary policy

Has India been prone to reversals of capital flows and volatility? After the balance of payments crisis in 1991, India managed to ride the wave of high profile crises in Asia, Latin American and elsewhere in the mid-1990s-early 2000s relatively unscathed. This resilience is attributed to its closed capital account and deft handling of exchange rate and reserve management. However since then India has had two episodes of capital flows reversal (see Appendix III). First in 2008-2009 when there was a massive sell off of equities across emerging markets in the immediate aftermath of the collapse of Lehman Brothers. There were large capital outflows by portfolio investors from India putting pressure on the exchange rate between 2008 Q3 and 2009 Q2. This sudden stop episode was handled in a typical manner, through the exchange rate defense using reserves, some exchange rate depreciation, and liquidity management. Reserves declined by $40 bn, about 14 percent of the total, within a quarter and exchange rate depreciated by 17 percent, over subsequent four quarters. This time around rather than a textbook interest rate increase in response to the sudden stop, policy rates were cut. The repo rate was reduced from 7.8 in 2008 Q2 to 4.8 percent in 2009 Q2.

A second episode of reversal was evident in summer 2013, when the expectations that the Federal Reserve would begin reducing the pace of its securities purchases had a large adverse impact on emerging markets. India was among those hit the hardest. Between May 22, 2013, and the end of August 2013, the rupee depreciated by 18 percent, and stock prices, foreign reserves and portfolio flows all declined. The reaction was sufficiently pronounced for the press to warn that India might be heading towards a financial crisis.[28] Even though exchange rate depreciated sharply at the time, India was nowhere close to a situation where it would have faced a BOP crisis and sought the IMF program. Contrary to some discussion that took place at that time, given its large reserve level of about $ 280 bn, a flexible exchange rate, there was no imminent risk of a full-fledged balance of payment crisis.

A more comprehensive defense was mounted this time. A range of policies were announced to contain the impact on exchange rate and financial markets. It intervened in the foreign exchange market, hiked interest rates, raised the import duty on gold, encouraged capital inflows from nonresident Indians, established a currency swap window for oil importing companies, extended a swap line with the Bank of Japan, and restricted capital outflows from residents and Indian companies.

[28] Basu et al (2015) suggest that India was affected because it had received large capital flows in prior years and had large and liquid financial markets that were a convenient target for investors seeking to rebalance away from emerging markets. An additional factor was that macroeconomic conditions had weakened noticeably in prior years—reflected in high fiscal and current account deficit and appreciated real exchange rate, rendering the economy vulnerable to capital outflows and exchange rate depreciation and narrowing policy space. Rebalancing by global investors when the Fed began to talk of tapering highlighted these vulnerabilities.

The RBI lost some $13 billion of reserves between end-May and end-September, 2013. It increased its overnight lending rate (the marginal standing facility rate) by 200 basis points to 10.25 percent on July 15, 2013, and tightened liquidity through open market operations and by requiring banks to adhere to reserve requirements more strictly. Gold imports being partly responsible for a large current account deficit, the government raised the import duty on gold multiple times, increasing it from 6 percent to 15 percent cumulatively. India being an oil importing country, demand for foreign exchange from companies that import oil can add significantly to the overall demand for foreign currency and thus affect the level and volatility of the exchange rate. The RBI opened a separate swap window for three public sector oil marketing companies in order to exclude their demand from the private foreign exchange market and reduce its volatility.[29]

New measures were announced to attract capital including from the nonresident Indians; the duration of an existing swap line with Japan was extended, and its limit increased from $15 billion to $50 billion. The RBI increased the foreign borrowing limit for banks (those with the capital adequacy ratio of at least 12 percent) from 50 per cent of unimpaired Tier-I capital to 100 per cent (for borrowings of at least three years); and offered to swap these borrowing with the RBI at a concessional rate of 100 basis points below the swap rate prevailing in the market. The RBI imposed new measures to restrict capital outflows, including reducing the limit on the amount residents could invest abroad or repatriate for various reasons, including for purchasing property abroad. Basu et al (2015) estimate the impact of these measures on the exchange rate and financial markets. They show that some of these measures, including the separate swap window for oil importing companies, were of limited help in stabilizing the financial markets. Others, like initiatives restricting capital outflows, possibly undermined investors' confidence.

5. Capital Flow Measures—India regulates capital flows countercyclically through a variety of quantitative and price measures

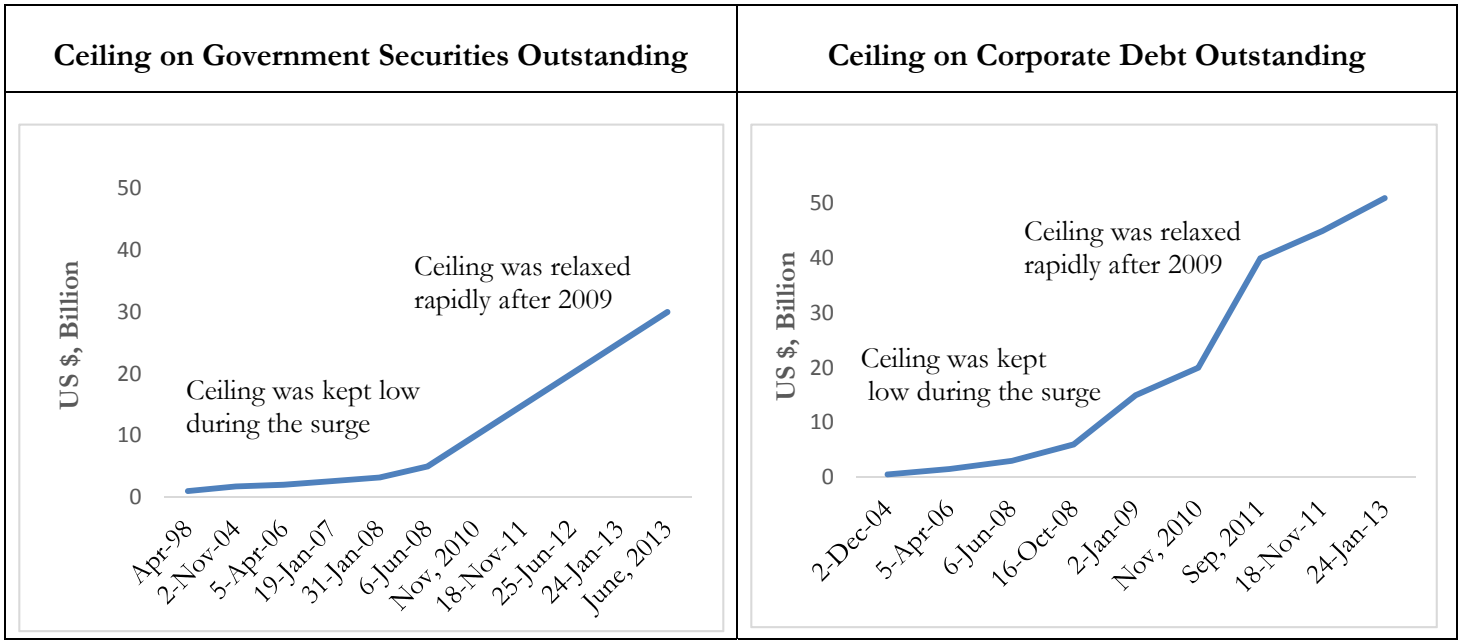
Despite increased liberalization over time, capital flows continue to be regulated in India through quantitative as well as price restrictions. The overall thrust of policy has been to encourage equity flows over debt flows and long term flows over short term flows. There are firm level, sectoral or aggregate limits on different kinds of capital inflows. There are also restrictions on capital outflows by residents--individuals can remit abroad a limited amount each year, and firms' investment abroad cannot exceed a certain multiple of their net worth. Due to these measures, even as the volume of capital inflows to India has increased over

[29] None of these policy measures were novel in the Indian context, having been implemented at different times in the past. E.g. the import duty on gold was prevalent until early 1990s; deposits from the Indian diaspora were attracted in a similar fashion twice in the past, in 1998 and in 2000; a separate swap window was made available to oil importing companies in 2008 to reduce volatility in the foreign exchange market after the collapse of Lehman Brothers.

time, corporate, bank, and sovereign balance sheets have remained relatively insulated from the impact of the occasional reversals of capital and sharp adjustments in exchange rate.[30]

While portfolio equity and FDI inflows have been liberalized steadily over time, the pace of liberalization of debt flows, and outward investment, has synchronized with the underlying capital flow cycles. Further liberalization of debt inflows slowed down during the period of capital surge, and picked up right after the sudden stops. On the other hand, the pace of liberalization of outflows picked up during the surge, but slowed down or even reversed during sudden stops. For example, the quantitative ceilings on foreign investment in government and corporate bonds were liberalized slowly until 2008, but the pace of liberalization picked up after 2009, the phase of slower and more volatile capital flows. Starting from a $ 1 billion limit on foreign investment in government bonds and $ ½ billion in private bonds in 1998, the limit was enhanced to $ 5 billion and $ 6 billion respectively by 2008. The ceilings were then relaxed rapidly in the aftermath of the sudden stop in 2008-09 to their current levels of $ 30 billion for government debt and $ 51 billion for corporate debt. Are these the current levels?

Figure 17: Ceilings on Investment by Foreign Institutional Investors in Government and Corporate debt were liberalized rapidly after the sudden stop of capital in 2008-2009



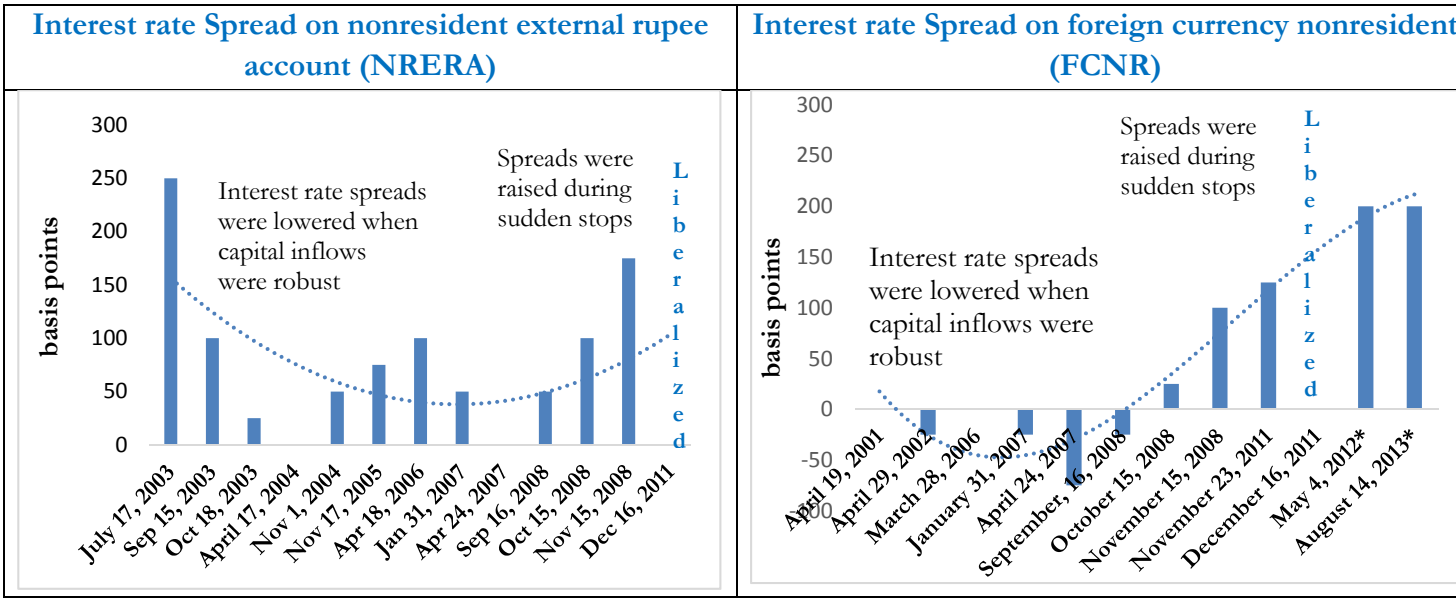
Source: RBI Notifications on Foreign Investment in India, and Kapur and Mohan (2012).

[30] Countercyclical macroprudnetial measures—especially sectoral provisions requirements and risk weights-- have been implemented, complementing countercyclical liberalization of capital flows. See Kapur and Mohan, and Patel et al for details on these.

NRI deposit flows to India gained momentum in the 1980s after the RBI introduced NRI deposit schemes to tap flows from the Indian diaspora. It made deposits fully repatriable, offered attractive interest rates, and assumed the exchange rate risk on foreign currency-denominated accounts. These schemes proved to be vulnerable during the 1991 balance of payments crisis, when the outflows of deposits compounded the pressure on the external accounts. Subsequently the composition of deposits was shifted toward rupee denominated accounts; their repatriable component was reduced; and the exchange risk on foreign currency deposits was shifted to the banks. The deposit inflows resumed and continued to be substantial during the 1990s.

Authorities responded to the robust inflows and India's strong external position by linking the interest rates offered on foreign currency deposits with Libor rate, i.e. essentially lowering the interest rates on NRI deposits; by granting the banks flexibility to set interest rates on rupee deposits; and by making all new deposits fully repatriable.[31] These measures resulted in the interest rates on NRI deposits declining sharply, and in moderating their inflows. Subsequently the maximum permissible spread on NRI deposits over Libor was lowered during surges, and increased during the period of capital flow slowdown.

Figure 18: Ceilings on Interest Rate Spreads (over Libor) for NRI Deposits have been revised in sync with the Capital Flow Cycle



Source: RBI Master Circulars on Interest Rates on NRI Deposits, various years.

[31] Gordon and Gupta (2004) established that the nonresident deposits respond positively to the differential between the interest rates on these deposits the return on competing international assets; with the impact of the interest rate differential outweighing the impact of other factors.

Among other avenues to raise capital, the access of the nonfinancial corporate sector to external debt has been liberalized gradually (external commercial borrowings), but is subject to adherence to criteria on purpose, interest rate spreads and magnitudes of borrowing. Just like for other debt flows, the criteria were relaxed after the collapse of Lehman Brothers, including the interest rates at which these loans could be raised were increased across maturities, Table 3 below.

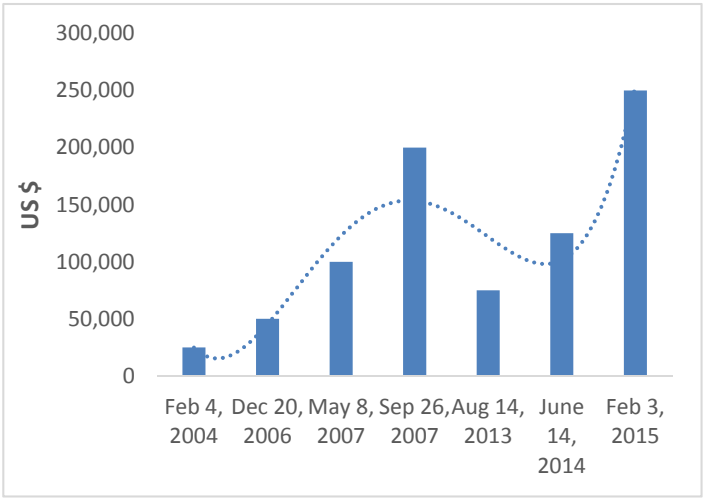
Table 3: Cost of External Commercial Borrowings (over 6 month Libor, in basis points)

	More than 3 years and up to 5 years	More than 5 years and up to 7 years	More than 7 years
31-Jan-04	200	350	350
21-May-07	150	250	250
29-May-08	200	350	350
22-Sep-08	200	350	450
22-Oct-08	300	500	500
2-Jan-09	Fully Liberalized	Fully Liberalized	Fully Liberalized
23-Nov-11	350	500	

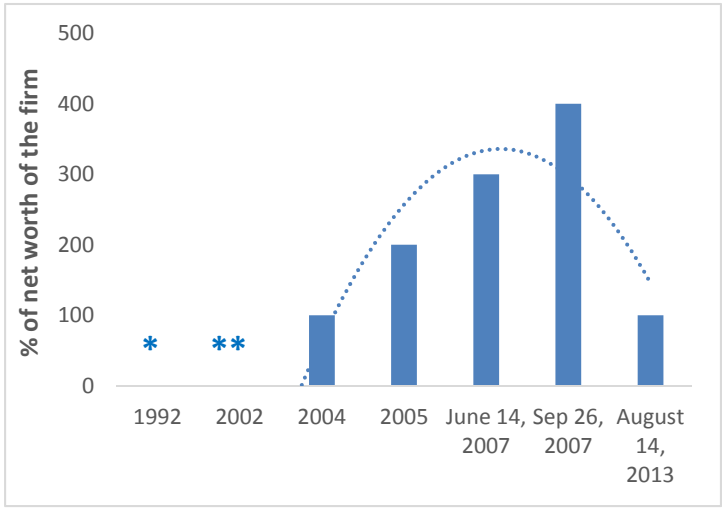
Capital outflows too have been liberalized progressively. Thus while inflows by non-residents have been made freely repatriable, resident non-financial companies have been enabled to invest abroad with fewer restrictions, and individuals are allowed to invest abroad within specified quantitative limits (individuals are, however, not permitted to borrow abroad). Individual limits on outward remittances by residents was increased repeatedly during the period of the capital surge, 2003-2007, and lowered in response to capital withdrawals around the tapering talk.

Figure 19: Outflows Permitted under Liberalized Remittances Scheme for Residents and Overseas Direct Investment Scheme for Firms

Outflows by residents under the Liberalized Remittances Scheme were liberalized during the "Surge"



Restrictions on Outward Investment by Firms have been liberalized in sync with the capital flow cycle



Source: RBI Notifications on Liberalized Remittance Scheme for Resident Individuals, and on Overseas Direct Investment, various years.
* While overseas investment up to $4 mn can be made via the automatic route, those between 4 mn and 15 mn require the RBI's approval, and investmnets worth more than 15 mn can only be made with the approval of the Ministry of Finance.
** automatic approval limit raised to 100 mn.

In wake of the capital account reversal during the tapering talk, the RBI announced restrictions on capital outflows from Indian corporates and individuals. It lowered the limit on Overseas Direct Investment under the automatic route (i.e. the outflows which do not require prior approval of the RBI) from 400 percent to 100 percent of the net worth of Indian firms, reduced the limit on remittances by resident individuals (which were permitted under the so-called Liberalized Remittances Scheme) from $200,000 to $75,000, and discontinued remittances for acquisition of immovable property outside India.

Basu et al (2015) note that the amounts remitted under the schemes were small, of the order of $100 million a month. There was no surge in remittances during the period of the tapering talk. Outflows were a paltry $92 million in June and $110 million in July 2013, hence there does not seem to be an apparent justification for this restriction. If anything, outflows once underway can be difficult to stem with such restrictions, with the incentive and scope for evasion remaining strong. Results in Basu et al (2015) indicate that in the five days from the time when this announcement was made, exchange rate depreciation and decline in stock market index were accentuated, while equity flows declined. Commentary in the international financial press reflected the fears that these controls evoked (*Economist*, August 16, 2013, "…. India's authorities have planted a seed of doubt: might India 'do a

Malaysia' if things get a lot worse? Malaysia famously stopped foreign investors from taking their money out of the country during a crisis in 1998…"; and *Financial Times*, August 15, 2013, "… the measure smacks more of desperation than of sound policy").

6. Summary

Due to steady liberalization of the capital account since the early 1990s and increased financial integration of the Indian economy over time, capital flows to India reflect broad global trends. Just like in other emerging markets, capital flows to India have been subject to a surge-and-stop cycle. The policy response has included reserve management, liquidity management, countercyclical capital flow measures and some monetary accommodation. Specifically, India eased money supply, accumulated reserves, accelerated the pace of liberalization of capital outflows, and slowed the pace of further liberalization of inflows during the "capital surge" episode of 2003-2008. It tightened monetary policy, used reserves to meet the demand for foreign exchange and avoid large exchange rate movements, and increased the pace of liberalization of inflows, while restraining outflows, during the periods of tepid inflows or outflows of capital, such as in 2008-09 or 2013.

Going forward, under the new inflation targeting framework, monetary policy will likely respond even more than before to meet the inflation target and adjust less than before to the capital flow cycles. One concern some people have with the move of a developing country such as India to inflation targeting is that it could result in greater exchange rate flexibility. Having liberalized the capital account progressively over the last two and a half decades, the scope to use capital flow measures countercyclically has perhaps diminished as well. Thus in years ahead, reserve management and macroprudential measures are likely to play a more significant role in helping respond to capital flow cycles, just as the policy makers and the economy develop greater tolerance for exchange rate adjustments.[32]

[32] Pontines (2011) examines whether countries that target inflation experience higher exchange rate volatility. After accounting for the self-selection of countries into inflation targeting, he finds that the nominal and real exchange rate volatility is lower in inflation targeting countries, particularly in developing countries.

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Appendix 1: India's Exchange rate Classification

Period	Reinhart and Rogoff (Fine classification)	IMF Classification
1992-1995	De facto peg	Conventional fixed peg to a single currency*
1996-2005	De facto crawling peg	Managed floating with no pre-announced path for the exchange rate
2006-2010	De facto crawling band that is narrower than or equal to +/-2%	Managed floating (with no pre-determined path for the exchange rate)
2010-2013		Floating

*Source: Babula and Otker-Robe, 2002 (IMF WP/02/155); IMF AREAER reports; Reinhart and Rogoff (2010)

Appendix II: Liberalization of Capital Flows

FDI Inflows

Date	Policy Announcement
July 1991	Restriction on FDI in low technology areas removed, NRIs and Overseas Corporate Bodies allowed to invest up to 100 per cent in high priorities sectors, foreign equity limit increased to 51 per cent for existing companies
October 1991	Power sector opened to foreign and domestic private investment.
1991	FDI allowed in passenger cars
October 1998	FDI permitted in mining and production of Titanium ores and Zirconium minerals
2000	FDI up to 100% permitted under the automatic route in industrial parks
May 2001	49 % FDI in private sector banks under the automatic route.
2005	100% FDI in construction development projects under the automatic route
February 2006	100% FDI in distillation and brewing of potable alcohol; manufacture of industrial explosives, hazardous chemicals; greenfield airport projects; natural gas/liquid natural gas pipelines, petroleum and natural gas; cash and carry wholesale trading and export trading; coal and lignite mining for captive consumption; infrastructure for marketing, retail of petroleum and natural gas; exploration and mining of diamonds and precious stones
April 2007	FDI in certain telecom services raised from 49 % to 74%
December 2011	100% FDI under the automatic route for green-field investments in pharmaceuticals
December 2012	51% FDI allowed in multi brand retail under law
July 2013	FDI in basic and cellular service raised to 100% (49% under the automatic route, the rest subject approval of the FIPB); 49 per cent FDI in single brand retail under the automatic route and beyond through the Foreign Investment Promotion Board (FIPB) route; FDI hiked from 74 to 100% for asset reconstruction companies, 49% FDI in commodity, power and stock exchanges under automatic route, 100 % in Courier services under automatic route; FDI in PSU oil refineries, commodity bourses, power exchanges, stock exchanges and clearing corporations (up to 49 %) put under automatic route not through FIPB.
August 2014	FDI cap in defense and insurance sectors raised to 49%; and to 100% in Railways
December 2014	FDI policy for construction eased

Outward FDI flows

Date	Policy Announcement
1992	Relaxation on overseas investment began in 1992 through the introduction of an automatic route for overseas investment up to $ 2 mn in a block of 3 years.
1995	A fast track route was adopted where the limits were raised from US$ 2 million to US$ 4 million and linked to average export earnings of the preceding three years. Cash remittance continued to be restricted to US$ 0.5 million. Beyond US$ 4 million, approvals were considered under the 'Normal Route' approved by a Special Committee comprising the senior representatives of the Reserve Bank of India (Chairman) and the Ministries of Finance, External Affairs and Commerce (members). The authority for approval of proposals up to $15 million was vested in the reserve Bank of India, but proposals of more than $15 million still had to be approved by the minister of Finance.
1997	Exchange earners, other than exporters, were also brought under the fast track route. Indian promoters were allowed to set up second and subsequent generation companies, provided the first generation company was set up under the Fast Track Route.
2002	Per annum upper limit for automatic approval raised to US$100 million of which 50 percent could be obtained from any authorized dealer of foreign exchange.
2003	Upper limit discontinued when the automatic route for outward FDI was further liberalized in March 2003 to enable Indian parties to invest to the extent of 100 per cent of their net worth.
2005	Limit was raised to 200 percent of net worth, prior approval from the RBI dispensed with, and firms were permitted to remit transfer funds through any authorized foreign exchange dealer. Indian firms' access to international financial markets was also progressively liberalized and they were granted permission to use special purpose vehicles in international capital markets to finance acquisitions abroad .
2007 (June)	Limit for overseas investment by an Indian company was raised to 300% from 200% of its net worth. Resident employees of a foreign company's office, branch, or subsidiary in India in which the foreign company holds not less than 51% equity, either directly or indirectly, may invest under an employee stock option plan without limit, subject to certain conditions.
2007 (Sep)	Limit for overseas investment by an Indian company was raised to 400% from 300% of its net worth.
2010	Unregistered partnership and proprietorship firms subject to certain conditions may invest abroad up to 200% of their net worth with RBI approval.
2012	Previous condition that the foreign company have a direct/indirect holding of at least 51% in an Indian company was eliminated. ADs may also allow remittances from resident individuals for acquisition of qualifying shares for the position of director in the overseas company according to the laws of the host country. The limit of these remittances is within the overall ceiling prescribed for resident individuals under the LRS in effect at the time of acquisition. Resident individuals may acquire shares of a foreign entity in part or full consideration of professional services rendered to the foreign company or in lieu of director's remuneration within the overall ceiling under the LRS in effect at the time of acquisition.
2013	Limit on Overseas Direct Investment under automatic route reduced from 400% of the net worth of the Indian party to 100%. Resident individuals may set up/acquire JV/WOS abroad within the limit of the LRS. ODI in excess of 100% of net worth is considered under the approval route by the RBI. Indian companies, statutory bodies, and registered partnership firms (Indian parties) making ODI in overseas JVs or WOS may invest up to 100% and 400% of their net worth through the automatic route and approval route, respectively.
2013 (Sep)	Limit on overseas direct investments, through External Commercial Borrowings, reinstated to 400% of net worth.

Portfolio Equity Flows

Date	Policy Announcement
1992	Foreign institutional investors (FIIs) were permitted into the country in 1992. These could be pension funds, mutual funds or endowments, etc. with at least 50 investors, where no investor held more than 5 percent stake in it. They were allowed access to primary and secondary market for securities, and products sold by mutual funds, but had to hold at least 70 percent of their investment in equities. Each FII could hold up to 5 percent ownership of any firm, and all FII together could not hold more than 24 percent of a firm's equity.
1996	100 percent debt FIIs" were allowed, which could invest in corporate bonds subject to a 30% ceiling on this investment. Total ownership by all FIIs of local firms raised from 24 percent to 30 percent
1998	In 1998 FIIs were allowed to invest in government bonds, upto a combined ceiling of $ 1 billion. The ceiling on ownership by each FII in any firm was raised from 5 % to 10 %. FIIs permitted to partially hedge currency exposure using the currency forward market. The same year investment limits by NRIs, PIOs and OCBs in a firm enhanced from 1 to 5 percent of the equity
1999	In 1999 the requirement that FII must have at least 50 investors eased to 20 investors; and in 2000 Requirement that no investor can have over 5 percent of the FII fund eased to 10 percent
2000	In 2000 only the ceiling upon total ownership by all FIIs of local firms raised from 30 percent to 40 percent (subject to shareholder resolution).
2001	In March 2001, the ceiling was further raised to 49 percent, and again in September same year to the sectoral cap of the industry (subject to shareholder resolution).
2003	FII approval process changed from a dual (both RBI and SEBI approving) to a single approval process by the SEBI.
2006	FII of upto 23percent permitted in market infrastructure institutions in the securities markets (such as stock exchanges, depositories, and clearing corporations.)
2009	FIIs allowed to participate in interest rate futures.
2010	FIIs allowed to offer domestic government securities and foreign sovereign securities with AAA rating as collateral (in addition to cash) to recognized stock exchanges in India for their transactions in the cash segment of the market.

Portfolio Debt flows

Date	Policy Announcement
1995	SEBI released regulations governing FII investment in debt markets in India. Debt limit kept at USD 1-1.5 bn. FIIs allowed to invest in debt markets via 70:30 route, of which equity investments not to be less than 70% of total funds and maximum of 30% investment allowed in debt.
1996	100% debt FII allowed to those FII's who were interested only in debt securities. Overall debt limit maintained at $1-1.5 bn for FII investments routed through both kinds of categories. Investment also allowed in corporate bonds of listed (or to be listed) companies.
1998	FII in unlisted debt securities permitted. Debt limit in government securities set at USD 1 bn.
2004	Debt limit in government securities raised to USD 1.75 bn while that of corporate bonds set at USD 0.5bn. Under the 70:30 route there was a cap of USD 100 mn and for 100% debt route this was kept at $900 mn. This cap was raised to USD 200mn and USD 1.55 bn respectively in November 2004.
2006	Debt limit in government securities raised to USD 2 bn while that of corporate securities raised to USD 1.5bn. The total debt limit was raised from $2.25 bn to $3.5 bn. Separate limit for investment in Upper Tier II instruments introduced and kept at USD 0.5bn. Limits changed for the 70:30 route and decreased through the 100% debt category. For the 70:30 route, Government debt increased from USD 225 mn to USD 540 mn and corporate bond from USD 135 million to USD 450 mn respectively
2007	Debt limit for government securities raised again to USD 2.6bn.
2008	Debt limit for investment in government securities increased to USD 3.2 bn in Jan 2008 and further to USD 5 bn in June 2008. Limit for investment in corporate bonds doubled to USD 3 bn in June 2008 and further to USD 6 bn in Oct 2008.
2009	Limit for investment in corporate bonds increased to USD 15 bn.
2010	Debt limits doubled to USD 10 bn in government securities while that in corporate bonds increased to USD 20 bn.
2011	Investment limit in government securities increased to USD 15 bn. The incremental maximum of US$5 billion may be invested in securities without any residual maturity criterion. The limit for investment in corporate securities increased to USD 40 bn in Sep 2011 and further to USD 45 bn in Nov 2011. The incremental limit of US$5 billion may be invested in listed corporate bonds. (3) The limit for infrastructure bonds (separate from corporate bonds) was retained at US$25 billion.
2012	Investments limits increased further to USD 20 bn in government securities.
2013	Limit for investment in government securities increased to USD 25 bn in Jan 2013 and to USD 30 bn in June 2013. Corporate debt investment limit increased to USD 51 bn. The requirement that the government securities have a residual maturity of three years at the time of the purchase was eliminated, but FIIs and long term investors may not purchase treasury bills within the US$15 billion sublimit. In order to simplify the investment limits for FIIs and long-term investors in government securities and corporate debt, the debt limits were merged into two broad categories: (1) The government debt limit merged the two sublimits under government securities to (a) US$10 billion for investment by FIIs in government securities, including treasury bills and (b) US$15 billion for investment in dated government securities by

	FIIs and long-term investors. (2) The corporate debt limit merged the existing sublimits under corporate debt to (a) US$1 billion for qualified foreign investors (QFIs), (b) US$25 billon for investment by FIIs and long-term investors in sectors other than infrastructure, and (c) US$25 billion for investment by FIIs/QFIs/long -term investors in the infrastructure sector.
2014	In Apr 2014, FIIs were permitted only in government dated securities having residual maturity of one year. In Jul 2014, investment limit in government securities available to FIIs/QFIs/FPIs was raised by USD 5 billion by correspondingly reducing the amount available to long term investor from USD 10 billion to USD 5 billion within the overall limit of USD 30 billion. The incremental investment limit of USD 5 billion shall be required to be invested in government bonds with a minimum residual maturity of three years. Further, all future investment against the limit vacated when the current investment by an FII/QFI/FPI runs off either through sale or redemption shall also be required to be made in government bonds with a minimum residual maturity of three years. It was also clarified that there will be no lock-in period and FIIs/QFIs/FPIs shall be free to sell the securities (including that are presently held with less than three years of residual maturity) to the domestic investors.
2015	In Sep 2015, the RBI increased the limit that FPIs can invest into government bonds to 5% of the outstanding stock by March 2018. It also introduced a separate limit for investment in State development loans, increased in phases to reach 2% of the outstanding stock by March 2018. The RBI permitted issuance of Rupee bonds in offshore markets with a minimum maturity of 5 years within the ceiling of investment in corporate debt of $51 billion.

External Commercial Borrowings

Date	Policy Announcement
Jan 2004	Prepayment of ECB up to USD 100 mn is permitted without prior approval of RBI; All in cost ceiling on ECBs with maturity of more than 3 years and upto 5 years set at 200 bp above 6 month LIBOR. Ceiling on ECBs with maturity between 5 and 7 years and more than 7 years set at 350 bp above 6 month LIBOR.
Jul 2006	Corporates can avail of ECB of an additional amount of USD 250 mn with average maturity of more than 10 years under the approval route, over and above the existing limit of USD 500 million under the automatic route, during a financial year.
Dec 2006	Prepayment limit on ECB was enhanced to $ 300 mn.
May 2007	All in cost ceiling on ECBs with maturity of more than 3 years and upto 5 years reduced to 150 bp above 6 month LIBOR. Ceiling on ECBs with maturity between 5 and 7 years and more than 7 years reduced to 250 bp above 6 month LIBOR
May 2008	ECB in infrastructure sector allowed up to USD 100 mn while that in industrial sector allowed up to USD 50 mn for Rupee capital expenditure within the overall limit of USD 500 million per borrower, per financial year, under Automatic Route. Corporates in the services sector allowed ECB up to USD 100 mn, per borrower, per financial year, for import of capital goods. NGOs engaged in micro finance activities can raise ECB up to USD 5 mn during a financial year. Prepayment of ECB up to USD 500 mn may be allowed by AD banks without prior approval of RBI subject to compliance with the stipulated minimum average maturity period as applicable to the loan.

	All in cost ceiling on ECBs with maturity of more than 3 years and upto 5 years raised to 200 bp above 6 month LIBOR. Ceiling on ECBS with maturity between 5 and 7 years and more than 7 years raised to 350 bp above 6 month LIBOR
Sep 2008	Ceiling on ECBs with maturity of more than 7 years raised to 450 bp above 6 month LIBOR
Oct 2008	All in cost ceiling on ECBs with maturity of more than 3 years and upto 5 years raised to 300 bp above 6 month LIBOR. Ceiling on ECBs with maturity between 5 and 7 years and more than 7 years raised to 500 bp above 6 month LIBOR
Jan 2009	Ceilings fully liberalized on ECBs of all maturities.
July 2009	Corporates can avail of ECB of an additional amount of USD 250 mn with average maturity of more than 10 years under the approval route, over and above the existing limit of USD 500 mn under the automatic route, during a financial year. Other ECB criteria, such as end-use, recognized lender, etc. need to be complied with. Prepayment and call/put options, however, would not be permissible for such ECB up to a period of 10 years.
Sep 2011	Eligible borrowers under the automatic route other than corporates in the services sector viz. hotel, hospital, software and miscellaneous services can avail of ECB beyond USD 750 mn or equivalent per financial year. Corporates in the services sector viz. hotels, hospitals, software sector and miscellaneous services are allowed to avail of ECB beyond USD 200 mn or its equivalent in a financial year for meeting foreign currency and/ or Rupee capital expenditure for permissible end-uses. The proceeds of the ECBs should not be used for acquisition of land.
Nov 2011	Ceilings on ECBs of maturities between 3 and 5 years set at 350bp over the 6 month LIBOR while that of between 5 and 7 years set at 500 bp over 6 month LIBOR.
June 2012	The maximum permissible ECB that can be availed of by an individual company limited to 50 per cent of the average annual export earnings realized during the past three financial years. Overall ceiling for ECBs to be USD 10 bn.
Aug 2013	Limit on Overseas Direct Investment under automatic route reduced from 400% of the net worth of the Indian party to 100%. Resident individuals may set up/acquire JV/WOS abroad within the limit of the LRS. ODI in excess of 100% of net worth is considered under the approval route by the RBI. Indian companies, statutory bodies, and registered partnership firms (Indian parties) making ODI in overseas JVs or WOS may invest up to 100% and 400% of their net worth through the automatic route and approval route, respectively.
Sep 2013	Limit on overseas direct investments, through External Commercial Borrowings, reinstated to 400% of net worth. ECBs permitted to finance general corporate purposes subject to conditions such as average maturity of at least 7 years, the foreign lender should have a minimum direct stake of 25% in the Indian company; repayment should not commence before completion of 7 years.
May 2014	Foreign equity shareholders of Indian companies in the manufacturing, infrastructure, hotels, hospitals and software sectors to be allowed to provide loans (ECBs) for general corporate purposes, which includes for working capital purposes. This would be available with the approval of the authorized dealer bank, subject to: (a) the direct foreign equity shareholder being a 25% shareholder; (b) the ECB not being used for prohibited purposes; and (c) the principal repayments to start after seven years from the date of disbursement. The same is available to all eligible borrowers for all other sectors with approval from the RBI.
Jan 2015	Authorized money changing banks allowed to create a charge on securities. Until now the choice of security to be provided to the overseas lender or the supplier for securing ECB was left to the borrower.
Nov 2015	ECB framework revised to comprise of three tracks. Track I to comprise of Medium term foreign currency denominated ECB with a minimum average maturity of 3 to 5 years. Track II to comprise of long term foreign currency denominated ECB with a minimum average maturity of 10 years. And Track III comprises of Indian rupee denominated ECB with minimum average maturity of 3 to 5 years.

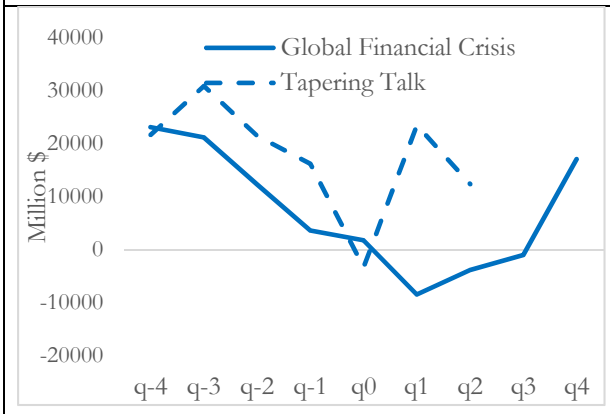
NRI deposits

Date	Policy Announcement
February 1970	Rupee-denominated account—the Nonresident (External) Rupee Account (NR(E)RA)—was introduced. This provided for repatriation of both principal and interest.
November 1975	Foreign currency denominated deposit facility—the FCNRA—was added. deposits were also repatriable and were made attractive to banks through the RBI assuming the exchange rate risk.
November 1990	A nonrepatriable scheme, the FC(B&O)D, was introduced which was open to both foreigners and NRIs. The scheme was terminated in July 1993.
June 1991	A new foreign currency scheme, the FCON was introduced. Its distinguishing feature was that the principal was not repatriable.
June 1992	A nonrepatriable rupee-denominated scheme, the NR(NR)D, introduced. Banks allowed to fix interest rates on these deposits.
May 1993	A new repatriable foreign currency scheme, the FCNRB, was introduced, which differed from the FCNRA in that the banks were made to bear the exchange rate risks themselves
May 1994	The maximum interest rate on rupee deposits reduced to 10 percent (the same as on domestic deposits).
Aug 1994	FCNRA scheme was closed to new deposits with effect from August 1994. By 1997, all remaining balances had been repaid
Oct 1994	The maximum interest rate on rupee deposits was further reduced to 8 percent (2 percentage points below the ceiling on domestic deposits).
Oct 1995	The maximum interest rate on rupee deposits increased to 12 percent.
April 1996	Interest rates on term deposits with maturity of two years or higher freed.
April 1997	Interest rates on term deposits with maturity of one year or higher freed; interest rates on FCNR(B) permitted to be determined by the banks subject to ceilings.
Sep 1997	Interest rates on deposits of all maturity freed.
Oct 1997	FCNR (B) deposits to be offered at LIBOR of the relevant currency and maturity.
April 1998	FCNR (B) deposits of maturity of one year or higher to be offered at 50 basis points above LIBOR and lesser maturity deposits to be offered at 25 basis points below LIBOR.
Oct 1999	Minimum maturity of foreign currency deposits raised from six months to one year.
April 2001	FCNR (B) deposits to be offered at 25 basis points below LIBOR.
April 2002	FCNR(B) deposits with 1–3 years maturity to be offered at LIBOR/swap rates for respective maturities/corresponding maturities minus 25 basis points.
April 2002	No fresh deposits to be accepted under NRNR scheme, overdue NRNR deposits not to be renewed, may be credited to the NRE accounts. If the NRNR deposits holder does not hold NRE account, he may be allowed to repatriate the maturity proceeds of the NRNR deposits outside India.
July 2003	Ceiling on interest rates on NRE deposits fixed at 250 bps above the LIBOR.

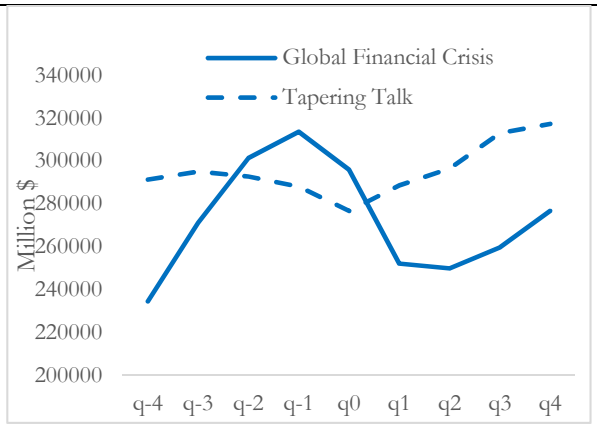
Sep 2003	Ceiling on interest rates on NRE deposits fixed at 100 bps above the LIBOR.
Oct 2003	Ceiling on interest rates on NRE deposits fixed at 25 bps above the LIBOR
Apr 2004	Ceiling on interest rates on NRE deposits fixed at LIBOR
Nov 2004	Ceiling on interest rates on NRE deposits raised to 50 bps above LIBOR
Nov 2005	Ceiling on interest rates on NRE deposits raised to 75 bps above LIBOR
March 2006	FCNR (B) deposits to be offered at LIBOR.
April 2006	Ceiling on interest rates on NRE deposits raised to 100 bps above LIBOR
Jan 2007	Ceiling on interest rates on NRE deposits reduced to 50 bps above LIBOR; FCNR (B) deposits to be offered at 25 bps below LIBOR.
April 2007	Ceiling on interest rates on NRE deposits fixed at LIBOR; FCNR (B) deposits to be offered at 75 bps below LIBOR.
Sep 2008	Ceiling on interest rates on NRE deposits raised to 50 bps above LIBOR; FCNR (B) deposits to be offered at 25 bps below LIBOR.
Oct 2008	Ceiling on interest rates on NRE deposits raised to 100 bps above LIBOR; FCNR (B) deposits to be offered at 25 bps above LIBOR.
Nov 2008	Ceiling on interest rates on NRE deposits raised to 175 bps above LIBOR; FCNR (B) deposits to be offered at 100 bps above LIBOR.
April 2009	Banks were prohibited from granting fresh loans or renew existing loans in excess of Rs. 100 lakh against security of funds held in NR(E)RA and FCNR(B) deposits either to the depositors or third parties
Nov 2011	FCNR (B) deposits to be offered at 125 bps above LIBOR.
Dec 2011	Deregulated interest rates on NRE Deposits and NRO Accounts. Accordingly, banks are free to determine their interest rates on both savings deposits and term deposits of maturity of one year and above under Non-Resident (External) Rupee (NRE) Deposit accounts and savings deposits under Ordinary Non-Resident (NRO) Accounts with effect from December 16, 2011. However, interest rates offered by banks on NRE and NRO deposits cannot be higher than those offered by them on comparable domestic rupee deposits.
Mar 2012	AD Category I banks may allow repayment of such loans to the NRE/FCNR(B) account of the lender concerned subject to conditions.
May 2012	FCNR (B) deposits of maturity of one and 3 years to be offered at 200 basis points above LIBOR while deposits of maturity between 3 and 5 years to be offered at 300 bps above LIBOR.
Oct 2012	Loans against NRE/FCNR(B) Fixed Deposits :Rupee loans to be allowed to depositor/third party without any ceiling subject to usual margin requirements** Loans against NRE/FCNR(B) Fixed Deposits: Foreign Currency loans to be allowed to depositor/third party without any ceiling subject to usual margin requirements
Aug 2013	Banks were exempt from CRR on incremental FCNR (B) deposits and NRE deposits with a reference base date of July 26, 2013, and maturity of 3 years or more i.e. banks had the freedom to offer interest rates on NRE deposits with a maturity of 3 or more years without any ceiling
Mar 2014	Interest rates offered by banks on NRE deposits cannot be higher than those offered by them on comparable domestic rupee deposits. Banks no longer exempt from the CRR on incremental FCNR (B) deposits and NRE deposits

Appendix III: Sudden Stops in India

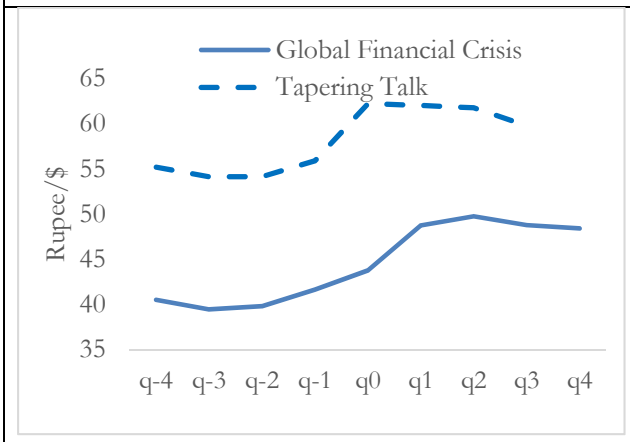
Portfolio and Other Capital Flows



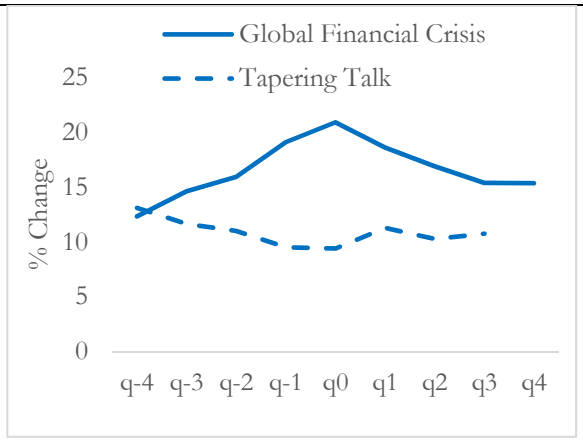
Reserves



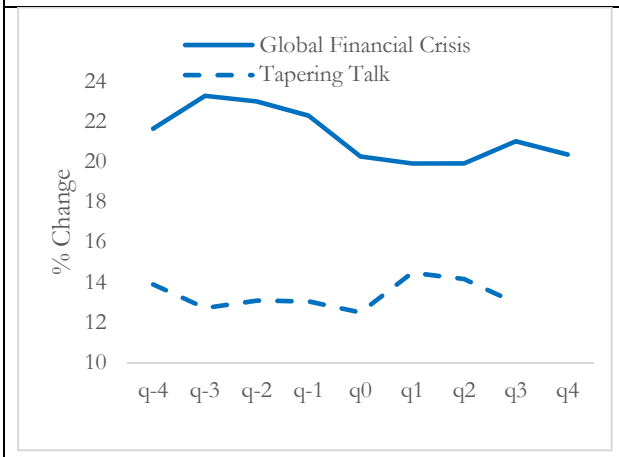
Nominal Exchange Rate



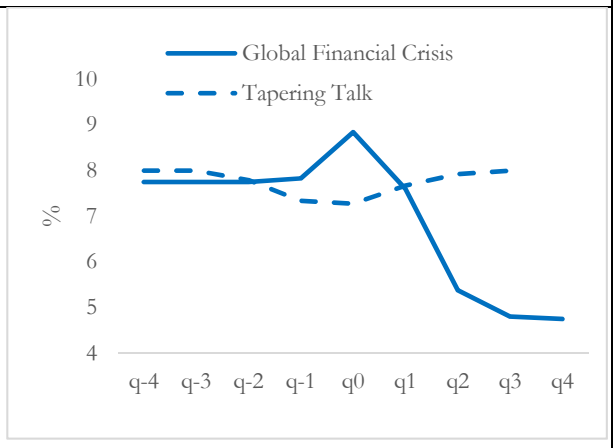
Reserve Money Supply *



Broad Money Supply Growth (M3)



Repo rate



*Narrow money in circulation with public. q0 refers to the quarter the sudden stop started, q-i to quarters before it started, and qi to quarters after it.