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**Management of International Capital Flows:
The Indian Experience**

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Management of International Capital Flows: The Indian Experience

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Abstract

In this paper we devise quantitative techniques to analyze the management of foreign capital flows in India over the past three decades. The paper argues that India's overall approach towards liberalization of the capital account can be characterized as gradualist and calibrated, whereby certain agents and flows have been accorded priority in the liberalization process, from the viewpoint of ensuring financial stability. A cross country analysis indicates that the calibrated approach has resulted in India being ranked towards the lower end of the spectrum in terms of capital account openness. We analyze the extant regulations governing different types of foreign capital flow, and highlight the evolution of various types of capital flows over the recent period. To evaluate Indian macroeconomic management in the face of capital flows, we quantify the various policy options under the classic problem of "impossible trinity". We find that India, like other emerging markets, has also been confronted with the various alternatives under "impossible trinity" and has chosen to adopt an intermediate regime, juggling the objectives of monetary independence, exchange rate stability, and an open capital account as per the needs of the economy.

JEL Classification: F36; F41 and E52

Keywords: Capital Flows, Impossible Trinity, Macroeconomic Management

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1 Introduction

During the period January 2008 to December 2009, several developing countries witnessed a sharp increase in volatility of international capital flows. According to the Institute of International Finance, net private flows to emerging markets dropped from a high of \$1.3 trillion in 2007 to \$530 billion in 2009, and are estimated to rise to \$709 billion in 2010. Such sharp swings in capital flows create a number of problems for a country's economic management, and have once again ignited the debate on appropriate extent of capital account openness. It is widely agreed that the outflow of capital from emerging markets in 2008 as well as the recent influx into these markets had very little to do with developments in developing markets. The initial 'flight to safety' of international capital from emerging markets was due to sharp decline in the risk appetite of the global investors in the aftermath of the collapse of financial institutions in the United States. Ironically, this decline in risk appetite pushed the investors to park their money in United States' treasury bonds, which witnessed an absolute decline in yields. In contrast, the recent inflow of capital into developing countries is being perceived to be a fall out of a widening interest rate differential due to extremely low interest rates prevailing in the industrialized countries. Some of these flows are likely to see a partial reversal once monetary easing in industrialized countries is reversed.

This has brought into fore the issue of effective management of the capital account and the efficacy of the use of capital controls. There are primarily two major reasons why a country wants to actively manage the capital account. A key concern of the emerging markets is that unbridled capital flows can exacerbate financial fragility and lead to a crisis. Large capital flows are likely to lead to excessive foreign borrowing and hence foreign currency exposure of the corporate sector. It also manifests itself in domestic credit booms, especially foreign currency denominated lending and asset bubbles. A sudden stop of capital flows in such circumstances can have several adverse consequences. The other concern is associated with macroeconomic management. It is recognized that a sharp increase in capital flows will cause an exchange rate appreciation, which will undermine the competitiveness of the tradeable sector. Alternatively, if the central bank intervenes to prevent the exchange rate from appreciating, it is likely to lead to an increase in money supply, fueling inflationary pressures.

As a result of these concerns a number of countries including India, Brazil, Taiwan, Turkey and Russia initiated a series of measures in the second half of 2009 to deter massive inflow of capital entering the country. This is not the first instance of countries resorting to capital controls. After the collapse of the Bretton Woods, throughout the 1980s and 1990s, a number

of Latin American and East Asian countries have relied on capital controls for macroeconomic management.

In this paper, we evaluate the management of capital flows in the Indian context. India, which started the liberalization of the capital account in the second half of the 1990s, adopted a calibrated and gradualist approach. While the capital account has been progressively liberalized, the liberalization has not been undertaken in an uniform manner. Certain types of flows and certain economic agents have been accorded priority in the liberalization process. The rest of the paper is as follows. In Section 2 we briefly review the key issues in the debate on opening up of the capital account. We also look at the history of capital controls and analyze the efficacy of these controls in various economies. Section 3 evaluates the extent of capital account openness in India, tracing its evolution during the last three decades as well as comparing India's openness with some of the other emerging markets. In Section 4 we highlight India's calibrated approach towards capital account liberalization, and look at the policy regime affecting the different types of capital flows. Section 5 looks into the issue of macroeconomic management and articulates how India has managed its exchange rate and monetary policy regime in the face of increased financial globalization. Finally, Section 6 concludes by summarizing the key points of the paper.

2 A Brief Review of the Existing Literature

The 1980s and 1990s saw a wave of financial liberalization in the emerging countries in Asia and Latin America with the belief that these capital scarce countries would benefit from international flows of capital. The proponents of capital account liberalization like [Fischer \(1998\)](#) and [Summers \(2000\)](#) argue that free movement of capital has helped a number of developing countries to raise their per capita incomes, while at the same time increasing stability in industrialized countries. It is also argued that access to international finance leads to a reduction in macroeconomic volatility, especially consumption volatility. By holding claims on foreign countries, agents can protect themselves against adverse shocks affecting home countries alone.

Despite the theoretical presumption that financial liberalization can have a positive impact on an economy, the empirical evidence is quite mixed and depends on the coverage of countries, time frame, choice of the dependent variable and the measure of capital account openness. [Edison et al. \(2002\)](#) find that after controlling for the standard determinants of growth, there is no impact of either the change or the level of capital account liberalization on economic growth. [Arteta et al. \(2003\)](#) also find that there is a fragile correlation between capital account liberalization and economic growth, although

the relationship is stronger if one takes into account the extent of trade openness and rule of law. In a similar vein, [Edwards \(2001\)](#), [Klein \(2005\)](#) and [Bailliu \(2000\)](#) find a positive effect only after a country has achieved a certain degree of economic, institutional and financial development.

A number of studies have also looked at the impact of certain components of capital flows on economic growth. [Mody and Murshid \(2005\)](#) argue that FDI has a strong positive impact on domestic investment. [Bosworth and Collins \(1999\)](#) also find that while FDI seems to have a positive impact on domestic investment, no such impact was discernible in the case of portfolio investments. In contrast, [Quinn et al.](#) find that both FDI and portfolio equity flows have a significant positive impact on growth.

[Kose et al. \(2009\)](#) argue that despite the scant evidence on direct benefits of capital account liberalization, there is a body of literature on the indirect ‘collateral benefits’. [Levine and Zervos \(1998\)](#) find that stock market liberalization enhances the liquidity of the equity markets. [Chinn and Ito \(2006\)](#) argue that financial openness leads to equity market development, provided a moderate level of legal and institutional development has been attained. Similarly, [Klein and Olivei \(2008\)](#) find that financially integrated economies have a higher degree of domestic financial sector development. [Rajan and Zingales \(2003\)](#) argue that financial sector development is countered by incumbents who would be hurt due to the resulting competition, and once an economy opens up to trade and financial flows, it weakens incumbents’ opposition, and facilitates financial sector development.

Another strand of literature argues that financial openness, raises the cost of pursuing a destabilizing policy in the form of capital outflow, and thereby induces countries to pursue prudent macroeconomic policies. [Gruben and McLeod \(2002\)](#) and [Sen Gupta \(2008\)](#) show that financial openness helps to reduce the incentive to generate inflationary shocks. [Kim \(2003\)](#) finds evidence that capital account liberalization helps reduce fiscal deficits.

However, the strongest advocates of capital account liberalization recognize that it can expose the vulnerabilities of a weak domestic financial system. If capital account liberalization places pressures on weak domestic banks, and adequate prudential supervision is absent, liberalization can encourage individually rational but socially harmful activities such as excessive risk-taking and “gambling for redemption”, which can culminate in costly banking crises. Consequently, critics of capital account liberalization like [Rodrik \(1998\)](#), [Bhagwati \(1998\)](#) and [Stiglitz \(2000\)](#) argue for the imposition of frictions to limit the international trade in short-term financial assets.

[Prasad and Rajan \(2008\)](#) contend that in an underdeveloped financial system, foreign capital is likely to be channeled to easily collateralized non-tradeable investments like real estate, leading to asset price booms, with

subsequent busts severely disrupting the economy. Foreign portfolio investment into shallow equity markets can also cause sharp valuation swings.

A number of studies including [Rajan and Subramanian \(2005\)](#), [Johnson et al. \(2007\)](#) and [Prasad et al. \(2007\)](#) show that massive unintended capital inflows could result in rapid real exchange rate appreciation, which can hurt exports of emerging markets. In some cases even a short-term appreciation can have lingering implications in the form of permanent loss of export market share and reductions in manufacturing capacity.

As a result of above outcomes a number of countries have resorted to capital controls to prevent short term capital flows. However, the efficacy of these controls has been the subject of debate and the existing literature provides very diverse conclusions. In one of the most exhaustive surveys on the efficacy of capital controls, [Magud and Reinhart \(2007\)](#) look at the literature on imposition of capital controls in Brazil, Chile, Columbia, Czech Republic, Malaysia and Thailand during the 1990s. They conclude that while capital controls on inflows allow monetary policy to be more independent, alter the composition of flows and in some cases alleviate exchange rate pressures, they are unable to reduce the volume of net flows.

One of the most often cited experiences of capital controls is that of Chile during the 1990s, wherein it imposed a tax in the form of requiring a certain percentage of foreign capital inflow to be held with the Central Bank and not earn any interest (Unremunerated Reserve Ratio). This was done to slow down the volume of capital inflows, tilt the composition towards longer maturities, reduce real exchange rate appreciation pressures and maintain a high interest differential. Studies by [Eichengreen \(2000\)](#) and [Eichengreen and Hausman \(1999\)](#) conclude that these controls helped to reduce vulnerability to external shock, reduce exchange rate volatility and stem currency appreciation. However, some of the empirical literature argues a more anemic effect of these controls. [De Gregorio et al. \(2000\)](#), [Valds-Prieto and Marcelo \(1998\)](#) and [Edwards \(1999\)](#) conclude that while Chilean controls altered the composition of capital flows through a decline in short term flows and an increase in long term flows, they could not prevent currency appreciation or provide greater monetary independence.

Columbia, was the other country, which experimented with controls on inflows in the form of withholding tax and introduced the URR. While these controls were not effective in deterring private capital inflows, [Cardenas and Barrera \(1997\)](#) argue that these controls contributed to the shift away from debt creating flows towards FDI, which was exempt from controls. However, it must be noted that imposition of these controls also coincided with other macroeconomic reforms such as introduction of an exchange rate band, dismantling of interest rate controls. new financing strategy aimed at domestic financing for the public sector and FDI for the private sector, all of which

contributed to the reduction in capital flows. Recently, Columbia resorted to capital controls between 2005 and 2007 in the form of 40% URR on external borrowings and portfolio inflows, cap of 500% of the overall gross exposure of each participant in the foreign exchange derivative market, limits on maturity mismatches, limits on open positions of foreign exchanges of financial intermediaries and limits on the amount of foreign currency pension funds could hedge. Villar (2010) argues that these measures had a stabilizing effect during the current crisis

In contrast, Brazilian controls which were aimed at reducing short term capital inflows, with an emphasis on fixed income securities, had limited success. Garcia and Valpassos (1998) point out that market participants found ways to circumvent these controls through financial engineering. They resorted to other instruments including investments in debentures, government securities, and derivative products that replicate fixed income returns in their bid to profit from the large interest rate differential that Brazil provided. However, studies like Cardoso and Goldfajn (1998) found that capital controls were effective in the short run by changing the composition away from equity and debt, but did not have a lasting impact.

Malaysia resorted to controls during 1993 and 1994 to curb short term flows which were seen as exacerbating financial sector risks as well as creating a discord with the ability to sustain policy of high interest rates, which were needed to combat inflation. These controls were accompanied with measures aimed at easing of interest rate policy, curtailment of sterilization operation and prudential regulations to address the liquidity situation. Malaysia also resorted to capital controls in 1998 after the Asian Crisis. The success of these controls is again a subject of debate. Kaplan and Rodrik (2001) find evidence that these controls allowed Malaysia to segment domestic financial markets from international financial markets and provided breathing room for monetary and financial policies and thereby allowed a speedier recovery than would have been possible if it had gone the IMF route. In contrast, Hood (2000) argues that the late imposition of the controls and an undervalued exchange rate meant that in any case there was little incentive for capital to leave. However, the erosion of confidence due to imposition of controls might have been reflected in the additional 300 basis points spread paid on floating rate debt after the controls had been instituted.

Thailand also experimented with the URR in late 2006 and imposed an URR of 30% on most types of capital flows, barring FDI. It also prohibited financial institutions from issuing and selling means of exchange in Thailand to non-residents. Coelho and Gallagher (2010) find that while the URR reduced the overall level of capital flows, it did not alter the composition of flows. Moreover, while there was no impact on monetary independence it resulted in increased exchange rate volatility

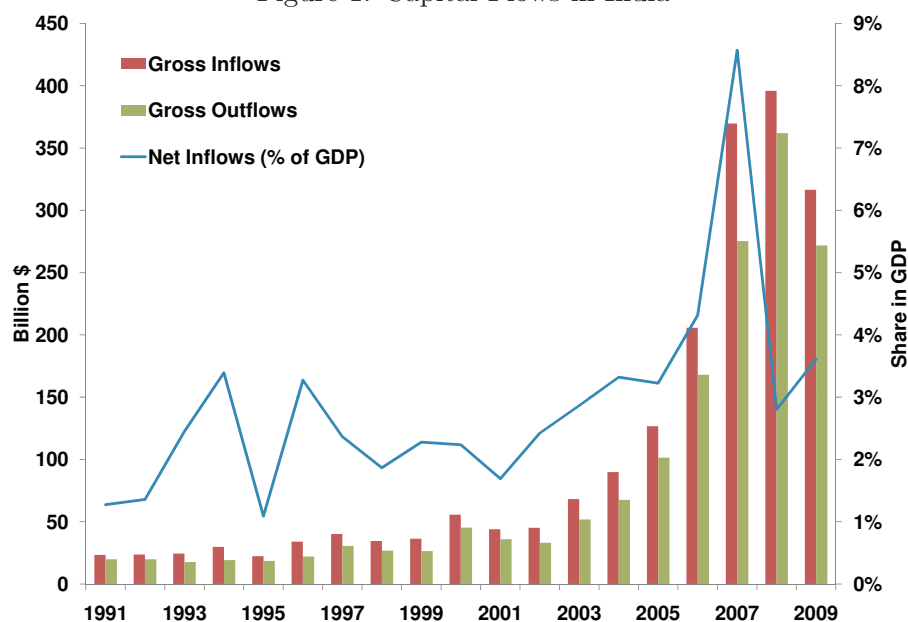
3 Extent of India's Capital Account Openness

Throughout most of the post Independence period until the early 1980s, India had a relatively closed capital account. External financing till the 1980s was primarily confined to external assistance through multilateral and bilateral sources, mostly on concessional terms to or through the government. This approach was associated with an import substitution strategy due to export pessimism, and relied on a host of tariffs and quotas to limit the need for foreign exchange. This scenario started changing since the early 1980s. A widening current account deficit due to higher oil prices, rise in demand for imports as a result of selective liberalization and a sharp depreciation of the rupee in the second half of the 1980s increased the demand for external finance. The problem was exacerbated by scheduled repayments of the Extended Fund Facility withdrawals India had made from the IMF during the early 1980s. As a result, the traditional sources of financing had to be supplemented with additional foreign capital and India resorted to short-term borrowings, external commercial borrowings and deposits by non-resident Indians (NRI). The final phase of liberalization was under the overall reform process that was initiated after the balance of payments crisis in 1991. On the external front, the reforms included dismantling of trade restrictions, move towards current account convertibility, a market oriented exchange rate regime and a gradual opening up the capital account.

During the last 20 years, India, has experienced a sharp increase in its financial integration with the rest of the world. Gross capital flows have increased nearly 18 times from \$43.2 billion in 1991 to over \$757.2 billion in 2008, before declining to \$588.2 billion in 2009 as a result of the global crisis. As a share of GDP, this amounted to an increase from 15.5% in 1991 to 62.8% in 2007 and 47.8% in 2008. This sharp increase in financial integration is due to a rise in both inflows and outflows. While gross inflows have increased from \$23.3 billion to \$395.8 billion between 1991 and 2008, gross outflow rose from \$19 billion to \$362 billion. The sharp rise in inflows and outflows indicate progressive liberalization of the capital account.

As is evident from Figure 1 over the last two decades, India has sustained a strong capital account surplus, which had grown sharply in the years before the global financial crisis. The sharp increase in both gross capital inflows and outflows is a result of progressive liberalization of various aspects of the capital account as well as India being viewed as a favourable investment destination. With an impressive economic performance indicated by close to 9% growth rate during 2003 to 2007, prevailing higher domestic interest rates and a strong currency India's risk perception was quite low. Furthermore, this period was also associated with favourable global conditions in the form of ample liquidity and low interest rates in the global markets.

Figure 1: Capital Flows in India

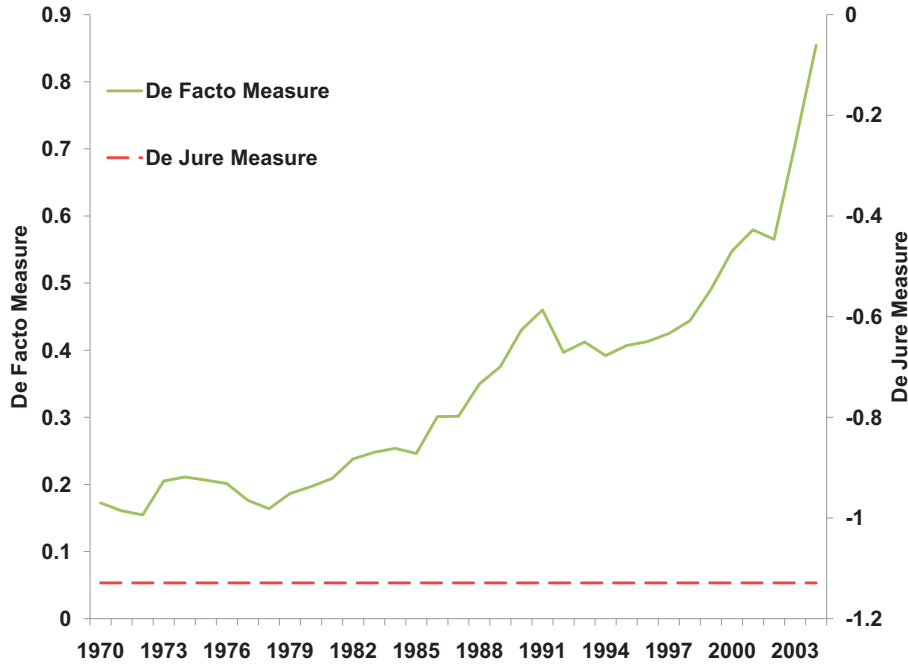


Source: Handbook of Statistics 2010, RBI

Typically, the extent of capital account liberalization has been determined using two kinds of measures. The first set of measures look at the *de jure* openness, and focus on laws governing the movement of capital in and out of the country. Most of such measures are based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions, which provides a binary evaluation on a number of categories of transactions. Several studies including [Chinn and Ito \(2008\)](#) and [Edwards \(2007\)](#) have used these scores to create an index of capital account openness. The second set of measures focus on *de facto* openness and look at the actual extent of cross-border capital flows. Several *de facto* measures including [Lane and Milesi-Ferreti \(2007\)](#) and [Kose et al. \(2008\)](#) are available. The two sets of measures can differ vastly as a country can experience large capital flows despite a closed capital account due to lack of enforcement, while others may have abolished capital controls but continue to record low capital flows.

Figure 2 indicates the evolution of capital account openness in India based on the *de jure* and *de facto* measures. The *de facto* measure, based on [Lane and Milesi-Ferreti \(2007\)](#) looks at the ratio of the sum of foreign assets and foreign liabilities to GDP. Typically, it includes portfolio equity, foreign direct investment, debt and financial derivatives. According to this measure, India's capital account openness has increased from 17.8% in 1970 to 85.4% in 2007. Bulk of this increase in openness has taken place during 2000 to 2007, when the index increased by over 40 percentage points indicating

Figure 2: Capital Account Openness in India



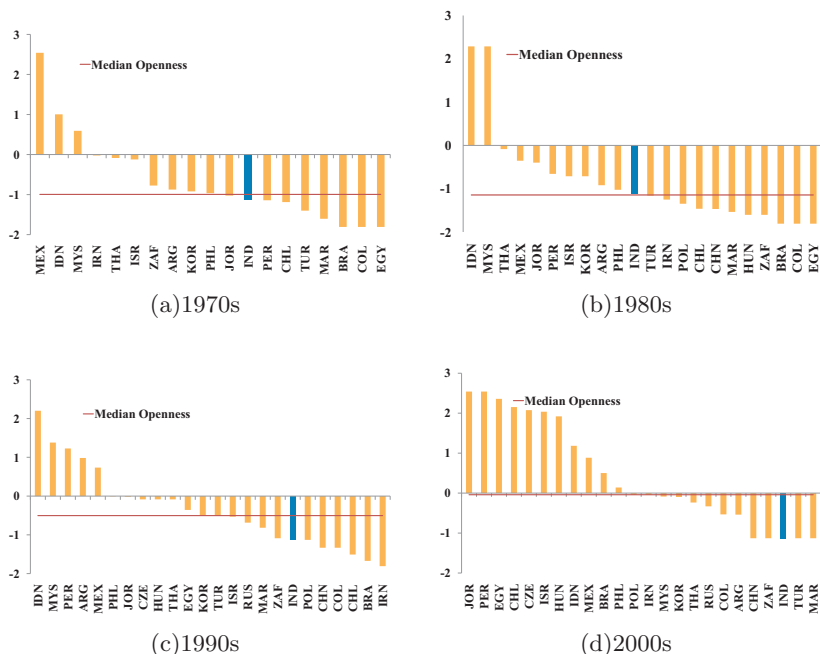
Source: Chinn and Ito (2008) and Lane and Milesi-Ferreti (2007)

a rapid integration of the Indian economy to global capital markets. In contrast, the de jure openness measure, based on Chinn and Ito (2008), provides a completely different picture. According to this measure, India's extent of openness has remained stagnant since early 1970s. The primary reason behind this divergence is the evaluation criterion in the AREAER.¹ In India, while several controls on inflows and outflows have been eased over the last three decades the fact that there are still some restrictions explains the low score. For example, an individual can take money out of India but up to a limit of \$200,000. Similarly, foreign investors are allowed to participate in corporate debt but up to a limit of \$15 billion. Even in the case of FDI, while across most sectors FDI is allowed, there are some sectoral caps.

A comparison of India's extent of capital account liberalization with other emerging markets yields several interesting results. Figure 3 indicates the decadal average *de jure* openness of some key emerging market economies. It is evident that over the last four decades there has been a significant increase in the extent of capital account openness indicated by the upward shift of the median line. However, India has failed to keep pace with the liberaliza-

¹In the AREAER a score of 0 indicates presence of some restrictions on a particular transaction, while 1 indicates free movement of capital. Hence according to this measure, even if a country has progressively liberalized some capital transactions, these transactions would continue to attract a score of 0 so long there are some minimal restrictions.

Figure 3: Cross Country Comparison of De Jure Openness



Source: Chinn and Ito (2008)

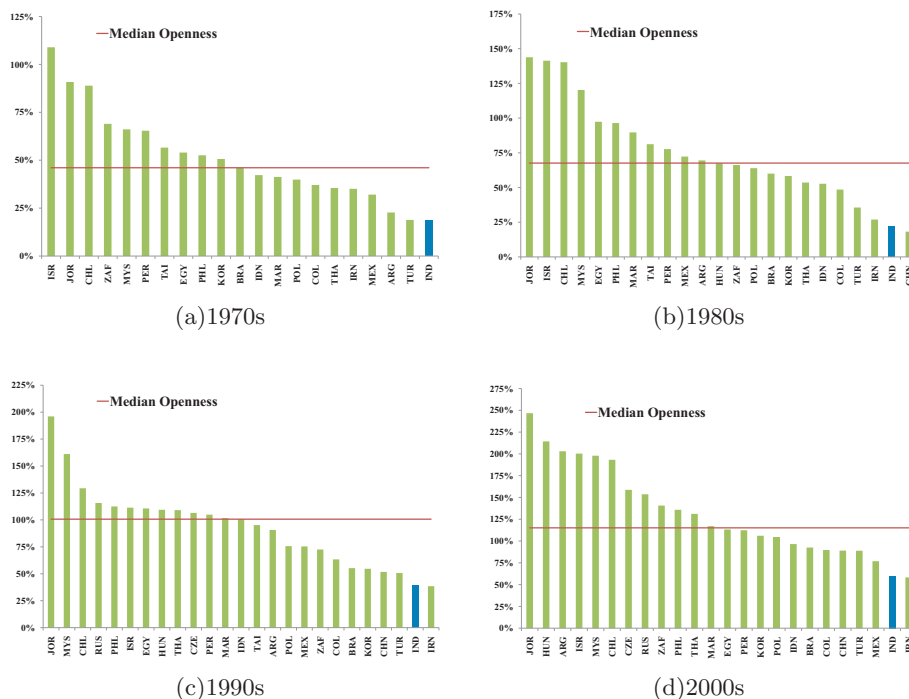
tion process and consequently has shifted from middle of the distribution of countries, ranked according to their openness, during the 1970s and 1980s towards the more restrictive end of spectrum in the last two decades. Again, as discussed above, one reason for this shift is the partial liberalization of various flows over the last two decades.

India has also been on the lower end of the spectrum when capital account openness is measured according to the extent of capital flows. Figure 4 shows that most of the Latin American as well as East Asian countries have experienced far greater degree of integration on the basis of the Lane and Milesi-Ferreti measure. Even China, which was lagging behind India in the 1980s, has overtaken India during the last two decades. The low *de facto* and *de jure* openness can be explained by India's approach towards liberalization of the capital account.

4 India's Approach to Capital Controls

India's overall management of capital flows can be characterized by its calibrated and gradualist approach towards capital account liberalization. With the Latin American debt crisis of the early 1980s fresh in mind, India prioritized certain kinds of flows and agents in the liberalization process. In

Figure 4: Cross Country Comparison of De Facto Openness



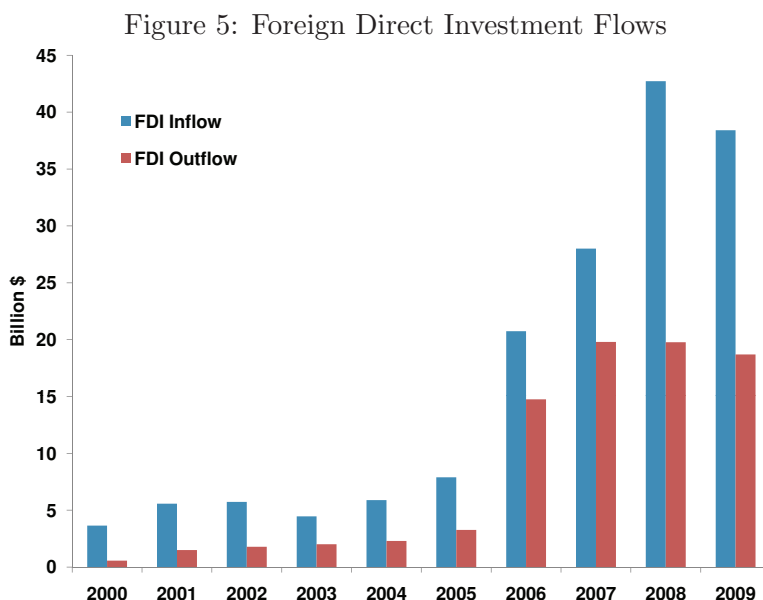
Source: Lane and Milesi-Ferreti (2007)

particular, right from the onset of the liberalization process, the need to shift away from debt to non-debt creating flows, enforce strict regulation of ECBs, especially the ones with short-term maturity, dissuade volatile flows from NRIs and a gradual liberalization of outflows, was recognized.

The primary form of non-debt creating flows include equity flows under FDI and portfolio investment. The policy for FDI inflows has been significantly liberalized over the past two decades. Currently, barring a few sectors, FDI is universally allowed. Sectors where FDI is prohibited include atomic energy, retail trading (excluding single brand retail) and certain agriculture and plantation activities. In addition, sectors which need an industrial license (for e.g. alcoholic beverages, defence equipment etc.) or are reserved for small scale sector are constrained in getting FDI. Some of the sensitive sectors like insurance, banking etc have sectoral caps. Table 1 provides a brief outline of the key regulations governing various types of capital inflows.

Figure 5 shows that there has been a sharp increase in FDI inflows in India since 2003, increasing from \$4.5 billion to over \$38.4 billion in 2009. Most of the FDI has been concentrated in the services sectors such as financial services, telecommunication, real estate, computer software etc. Bulk of the FDI coming into India, is routed through Mauritius as India has a preferen-

tial tax treaty with Mauritius. Globally, India's share in inward FDI among developing countries has gone up from 1.3% during 1990 to 2000 to 6.7% in 2008.



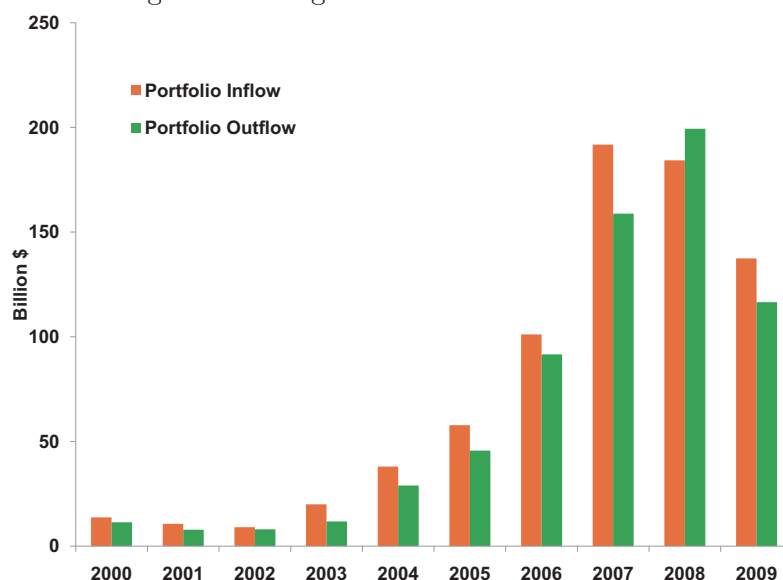
Source: Handbook of Statistics 2010, RBI

In recent years, the surge in FDI inflows has been associated with a jump in outbound FDI resulting from Indian companies acquisition of foreign companies. In addition, Indian corporates have been inclined to establish production and distribution networks to access newer technologies and natural resources. Overall FDI outflow jumped from \$2 billion in 2003 to \$18.7 billion in 2009. India also increased its share among developing countries in outward FDI from 0.2% to over 6.0%. This has happened primarily due to RBI's easing of restrictions. In Table 2 we indicate the major regulations influencing capital outflows. In the case of outward FDI, India has again adopted a gradualist approach and liberalized in an incremental manner. The relaxation of restrictions on outward FDI was initiated in 1992 with the introduction of an automatic route for investment up to \$4 million. The RBI could approve proposals up to \$15 million with higher proposals requiring an approval from the Ministry of Finance. The upper limit for automatic approval was raised to \$100 million per year. Subsequently, in 2004, firms were allowed to invest up to 100% of their net worth under the automatic route, which was raised to 200% in 2005. This limit was increased further to 300% in June 2007 and finally to 400% in September 2007.

Portfolio investment inflows has also witnessed a strong increase since 2004 and reached a peak of \$191.8 billion in 2007 before declining to \$137 billion in 2009 in the wake of the global financial crisis. India has been more cautious

in terms of liberalizing portfolio investment. There are separate investment caps on sub accounts of FIIs, individual FII and aggregate FII investment in a company. While NRIs are allowed to invest in Indian companies, they are also subject to caps at an aggregate and an individual level. Apart from these constraints, portfolio investors have complete convertibility as they can bring capital in and out of the country without requiring permissions. In terms of outward portfolio investment by Indian companies, the limit was raised from 35% of the net worth to 50% in September 2007. Furthermore, the aggregate ceiling for overseas investment by mutual funds was also enhanced from \$4 billion to \$5 billion in September 2007, and further to \$7 billion in April 2008. Registered venture capital funds are also allowed to invest in equity and equity-linked instruments of off-shore venture capital undertakings, up to an aggregate limit of \$500 million.

Figure 6: Foreign Portfolio Investment Flows



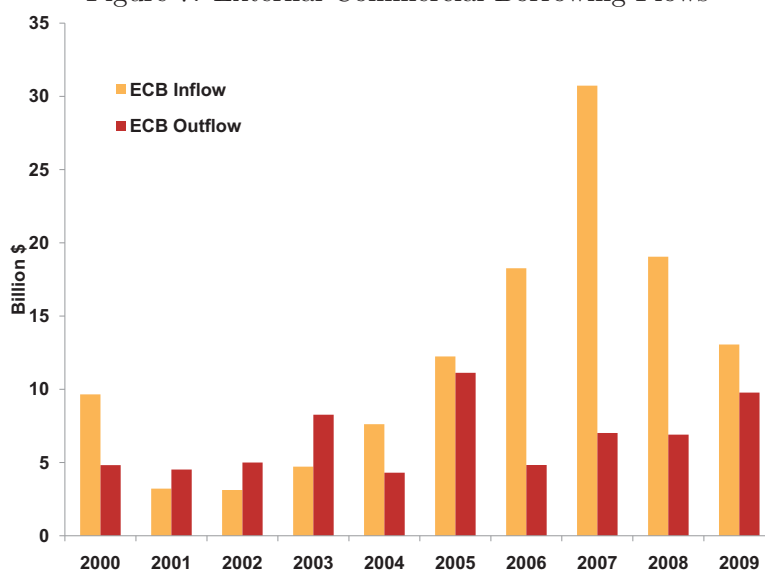
Source: Handbook of Statistics 2010, RBI

As described above, India has been more conservative in terms of liberalizing debt flows. ECBs are highly regulated with both borrowers and lenders having to satisfy eligibility criteria with a limit of \$500 million per borrower per financial year under the Automatic Route. Moreover, all ECBs need to have a maturity of 3 years and in some cases 5 years. There is also a cap on the all-in-cost payments that a corporate can make.² Finally, funds raised through these ECBs can be used to finance only certain activities like import of capital goods, new projects, modernization/expansion of existing

²All-in-cost includes rate of interest, other fees and expenses in foreign currency except commitment fee, pre-payment fee, and fees payable in Indian Rupees. Moreover, the payment of withholding tax in Indian Rupees is excluded for calculating the all-in-cost.

production units etc. The outflows on account of ECBs are also subject to certain restrictions, with there being limits on the amount that can be prepaid. Despite these restrictions, ECB inflows registered a sizeable jump during the past few years, primarily due to the attractive global interest rates. Figure 7 shows that ECB inflows have increased from \$5 billion in 2003 to over \$30 billion in 2007. In contrast ECB outflows have been fluctuating over the past few years. To encourage outflow of ECBs the RBI enlarged approved end uses to include overseas direct investment in Joint Ventures (JV) or Wholly Owned Subsidiaries (WOSs) in February 2004.

Figure 7: External Commercial Borrowing Flows



Source: Handbook of Statistics 2010, RBI

Foreign investment in government securities, treasury bills and corporate debt is also heavily regulated. Only NRIs and FIIs registered with SEBI can invest in these instruments. Earlier there was a cap on the share of total of investment funds that could be devoted to debt instruments. However, this was relaxed in 2008 in the wake of the crisis. Further there is cap on the amount FIIs can invest in corporate and government bonds, although these limits have been raised significantly over the past few years. Currently, the limit on corporate debt stands at \$15 billion while the limit on government debt is \$5 billion. Moreover, they can also invest in innovative instruments such as Upper Tier-II capital up to a limit of \$500 million.

Table 1: Key Regulations Governing Inflow of Capital

Foreign direct investment	Barring a few sensitive sectors, FDI is permitted in all sectors under the Automatic Route up to the sectoral caps. In cases where FDI is not permitted under the Automatic Route, approval from the Foreign Investment Promotion Board (FIPB) is required.
Foreign Portfolio Investment	Foreign entities registered as FIIs can invest under the Portfolio Investment Scheme. While investment by individual FIIs is subject to a ceiling of 10% of the paid up capital, aggregate FII investment is subject to a limit of 24% of paid up capital. In principle, the limit can be increased by the company subject to the sectoral limit permitted under the FDI policy. In addition, NRIs can invest up to an individual limit of 5% and aggregate limit of 10%. The latter can be increased to 24% by the concerned company.
Issue of ADRs/GDRs	Indian companies can raise foreign currency resources through the issue of ADRs/GDRs. There is no limit up to which an Indian company can raise ADRs/GDRs. However, these proceeds have to be kept abroad till actually required in India. There are no end-use restrictions except for a ban on investment of such funds in real estate or the stock market.
External Commercial Borrowings (ECBs)	ECB up to \$500 million per borrower per financial year is permitted only for foreign currency expenditure for permissible end use under the Automatic Route. While the infrastructure sector can avail of ECBs up to \$100 million for rupee expenditure for permissible end uses under the Approval Route, for other sectors the limit stands at \$50 million. Certain services sectors like hotels, hospitals and software firms can borrow up to \$100 billion to import capital goods. The all-in-cost interest ceiling for borrowings with maturity of three to five years is currently at 300 basis points over six-month Libor, while for borrowings of over five years the ceiling has been raised to 500 basis points over six-month Libor.
Investment in government securities and T Bills	FIIs can invest in sovereign bonds subject to a ceiling of \$5 billion. In addition, no ceiling is imposed on NRI investment in these instruments.
Investment in corporate debt	FIIs can invest in corporate debt within an overall limit of \$15 billion. In addition NRIs can invest in non convertible debentures issued by Indian companies, and there is no limit to NRI investment in these instruments.
Investment in mutual funds	Both FIIs and NRIs are allowed to invest in mutual funds without any limit.
Investment in commercial paper (CP)	Investment in CP by FIIs is subject to the limit applicable to corporate debt. NRIs are allowed to invest in CP on a non-repatriation basis.
Foreign Venture Capital Investors	Investment in units of venture capital funds can be undertaken by FVCIs registered with SEBI. In addition, FVCI investment in equity of Indian venture capital undertakings is also allowed subject to sectoral limits under the FDI policy. FVCIs are also allowed to invest in debt instruments floated by the IVCUs.
Investment in upper Tier II instruments	Investment by FIIs in Upper Tier II instruments raised in Indian rupees is allowed up to a ceiling of \$500 million.
Bank borrowing overseas	Banks can borrow overseas up to 25% of Tier I or \$10 million, whichever is higher.
Trade credit	Trade credits with a maturity of less than one year and up to \$20 million is allowed for permissible import transaction . In addition, only in the case of import of capital goods, trade credit with maturity of up to three years is allowed.
Export advance	Advances for exports can be obtained for a year with the rate of interest being Libor plus 100 basis points.

Source: Mohan (2008) and various RBI notifications

Table 2: Key Regulations Governing Outflow of Capital

Direct investment overseas by corporates	Indian companies can invest up to 400% of their net worth under the Automatic Route. Moreover, in certain sectors like energy and natural resources, Indian companies to invest in excess of 400% of their net worth.
Portfolio investment by Indian companies	Allowed up to 50% of the net worth in listed shares and rated and listed debt instruments. An earlier requirement of reciprocal 10% investment in Indian companies has been dispensed with.
External Commercial Borrowings	Prepayment of ECBs up to \$500 million is allowed without prior approval of the RBI subject to compliance with the minimum average maturity period as applicable to the loan.
Bank lending overseas subsidiaries of Indian companies	Restricted to 20% of net worth and to JV/WOS of Indian companies with at least 51% Indian shareholding.
Domestic mutual funds in various overseas instruments	Mutual funds can now invest overseas up to \$7 billion in a wide range of instruments including ADRs/GDRs. equities of overseas companies, IPOs and FPOs, foreign debt securities and money market instruments.
Qualification Shares	Allowed up to the limit of 1% of the paid up capital of the overseas company and the consideration for the acquisition is less than \$20,000 in a calendar year.
Shares of a JV/WOS abroad of the Indian software promoter company by the employees of Indian company	The purchase cannot exceed \$10,000 per employee in a block of five calendar years, and the shares so acquired cannot exceed 5% of the paid-up capital of the JV / WOS outside India.
ADR/GDR of Indian company in knowledge based sector by employees /working directors	The purchase cannot exceed \$50,000 in a block of 5 years.
Liberalized Remittance Scheme	An individual can remit up to \$200,000 per financial year for any permitted current or capital account transactions.
Acquisition of Foreign Shares	Apart from the above mentioned options, an individual can obtain foreign shares/securities if they are inherited, gifted by a person outside India, obtained under ESOP provided they do not involve any remittance from India etc.

Source: Mohan (2008) and various RBI notifications

5 India’s Tryst with the Impossible Trinity

In Section 1 we pointed out two main reasons for wanting to control the flow of capital. Volatile capital tends to exacerbate the fragility of the financial sector. Moreover, it can create complications for the macroeconomic management of the economy. This is related to the concept of “impossible trinity”, propounded originally in [Mundell \(1961\)](#) and [Mundell \(1968\)](#), and states that it is not simultaneously possible to have free capital flows, an independent monetary policy and a fixed exchange rate. Only two of the three objectives can be obtained at a particular point in time. For example, a country can obtain a stable exchange rate regime with an open capital account by giving up monetary independence. The monetary authority can no longer independently vary the domestic interest rate, which will have to follow the foreign interest rate. Alternatively, a country can retain monetary independence and an open capital account but will have to forgo exchange rate stability. Exchange rate movement will be dictated by the interest rate differential and quantum of international capital flows. Finally, the imposition of capital controls breaks the link between the interest rate and the exchange rate and allows a country to retain exchange rate stability with monetary independence. A number of countries including India, Brazil, Taiwan, Turkey and Russia have initiated a series of measures to deter massive inflow of capital entering the country.

As shown in Figure 2 there has been a rapid increase in India’s integration with the global economy since the mid 1990s. Prior to that India’s extent of capital account openness was extremely low and hence there was no dichotomy between stabilizing the exchange rate and retaining monetary independence. It is mainly in recent years where India has been forced to juggle the various conflicting objectives. To look further into this issue one would need to quantify the various objectives of the “impossible trinity”. We do this, largely, following the methodology outlined in [Aizenman et al. \(2010\)](#) and cover the period 1980 to 2007.³

Monetary Independence

We measure the extent of monetary independence as the inverse of the annual correlation of the monthly interest rates between India and the United States. The United States is taken as the base country following [Aizenman et al. \(2010\)](#) and [Shambaugh \(2004\)](#) who argue that Indian monetary policy through this period was most closely linked to the United States. We use the money market rates for the interest rates. In India, the Reserve Bank of India (RBI) uses a number of monetary policy tools like the repo rate, reverse repo rate, reserve ratio etc. Changes in any of these are going to

³The period coverage is limited by the availability of the measure of capital account openness.

have an impact on the money market rate. Following [Aizenman et al. \(2010\)](#) the index for extent of monetary independence is given by

$$MI = 1 - \frac{\text{corr}(i, i^*) - (-1)}{1 - (-1)} \quad (1)$$

where i refers to the Indian money market rate and i^* indicates the US money market rate. This index can take a maximum value of 1 and a minimum value of 0. By construction a higher value of the index implies greater monetary independence. While data on Indian money market rates are taken from the Reserve Bank of India, data on United States' rates are obtained from the International Financial Statistics (IFS).

Exchange Rate Rigidity

The index for Exchange Rate Rigidity is calculated using the annual standard deviations of the monthly exchange rate between India and the United States.

$$ERR = \frac{0.01}{0.01 + \sigma(\Delta(\epsilon))} \quad (2)$$

where σ indicates the standard deviation and Δ is the first difference operator and ϵ is log of the bilateral exchange rate between the Indian Rupee and the US Dollar. Again, the way the index is created it will lie between 0 and 1 with a higher number indicating a more rigid exchange rate regime.

Capital Account Openness

In construction of the capital account openness index we deviate from [Aizenman et al. \(2010\)](#), who use a *de jure* measure to analyze the extent of openness. As discussed above, for India, this might not be the most appropriate measure of openness as according to it India's extent of openness remained virtually unchanged since the 1970s. Moreover, we think that it is the actual quantum of flows that creates a conflict between monetary independence and exchange rate rigidity and not the regulations. A country with a high *de jure* openness can have low inflow of capital and hence not be worried about not being able to simultaneously stabilize exchange rate and retain monetary autonomy. On the other hand, a country with low *de jure* openness can experience a large flows due to low enforcement of capital controls, and be concerned about ensuring monetary independence and exchange rate stability. Thus *de facto* measures seem conceptually more appropriate if one is interested in the effects of an outcome based measure of financial integration. As a result we use the *de facto* measure outlined in [Lane and Milesi-Ferreti \(2007\)](#) where capital account openness is described as the ratio of the sum of foreign assets (FA) and liabilities (FL) to GDP. To make this measure comparable with the others we normalize it to lie between 0 and 1.

$$KO = \frac{FA + FL}{GDP} \quad (3)$$

Table 5 provides the main summary statistics for the three conflicting policy objectives. As can be seen there has been a wide range of variation on all the three indices during the 28 year period under study.

Key Summary Statistics

	Obs	Mean	Std. Dev	Min	Max
Monetary Independence	28	0.449	0.161	0.095	0.706
Exchange Rate Rigidity	28	0.575	0.235	0.158	1
Capital Account Openness	28	0.176	0.217	0	1

Before going further, one needs to analyze whether major domestic and international events have been associated with structural breaks in the index series. Two key important events that might have influenced the policy choices of the authorities are the economic reforms initiated after the 1991 crisis and the contagion from the East Asian crisis in 1997. To exclude the impact of the crisis we leave out the crisis year and the subsequent year. The first and second columns of Table 5 show that the mean for monetary independence declined significantly after India initiated its reform process in 1991. In contrast, the mean for capital account openness was nearly three times higher in the post reform period compared to the pre-reform period. We get similar results when we consider a structural break due to the Asian crisis. In fact the decline in monetary independence and increase in capital account openness is stronger in this case. In both cases there is an increase in the mean of exchange rate rigidity, but the difference is not significant.

Key Summary Statistics

	1980-90	1993-2007	1980-1996	1999-2007
Monetary Independence	0.584	0.361	0.535	0.271
Difference		0.223		0.263
t stat		4.361		5.962
Exchange Rate Rigidity	0.517	0.590	0.548	0.580
Difference		-0.070		-0.032
t stat		-0.980		-0.391
Capital Account Openness	0.080	0.252	0.091	0.361
Difference		-0.172		-0.270
t stat		-2.027		-3.544

A comparison of the evolution of these indices over time indicates the development of the payments regime in India. To do this we resort to ‘diamond charts’ where we measure monetary independence, exchange rate rigidity and capital account openness on the three vertices. On the fourth vertex we measure the extent of accumulation of international reserves (as a share of GDP).⁴ To make it comparable with the other measures we normalize this measure to lie between 0 and 1. The origin in these diamond charts indicate

⁴From 1997 onwards the measure is based on the actual intervention by the RBI to exclude valuation changes. However, for the period before 1997, due to data constraints the reserve accumulation includes valuation changes.

completely floating exchange rate, zero monetary independence, completely closed capital account and zero international reserves accumulation. Figure 8 highlights the trend for these measures for India during 1980 to 2007.

As is evident from Figure 8(a) and 8(b), during the 1980s there was limited amount of international capital movement with the normalized KO index fluctuating between 0 and 0.19. As a result the policymakers were able to retain both monetary independence and exchange rate stability. While the index of monetary independence varied between 0.5 and 0.71 with an average value of 0.58, the one for exchange rate stability fluctuated between 0.33 and 0.69 with an average value of 0.51.

In the late 1980s India's macroeconomic health began to deteriorate significantly. With a reorientation of its development strategy towards greater exports several measures were introduced to promote exports and liberalize imports for exporters. The relaxation of controls led to a surge in imports which were exacerbated by a sharp increase in import of petroleum products as domestic petroleum production slowed down. The situation worsened with the Gulf crisis, which led to a sharp spike in oil prices, and economic deterioration in Middle East and erstwhile Soviet Union, leading to a collapse of India's major export markets. The current account deficit widened from 0.9% of GDP in 1983-1984 to 2.33% in 1989-90.⁵ As the current account deficit became higher than funds available through aid financing, the government relaxed some of the capital controls. Consequently, the current account deficit started being financed by non-resident remittances and borrowings at commercial terms. Thus within a short span, there was a significant increase in the reliance on high-cost short-term financing.

Cerra and Saxena (2002) show that medium and long-term debts more than quadrupled and stood at \$13 billion in 1990-91 compared to only \$3 billion in 1984-85. Short-term external debt increased by \$6 billion during this period compared to reserve holdings of only \$2 billion, and the ratio of debt service payments to current receipts widened to nearly 30%. When the crisis broke out there was a net outflow of non-resident deposits and reluctance to roll-over short-term debt. The crisis was resolved by a combination of devaluation, deflation and borrowing from the IMF. Along with the stabilization effort, there was a concerted move towards a path of economic reform.

⁵The Indian fiscal year runs from 1st April to 31st March.

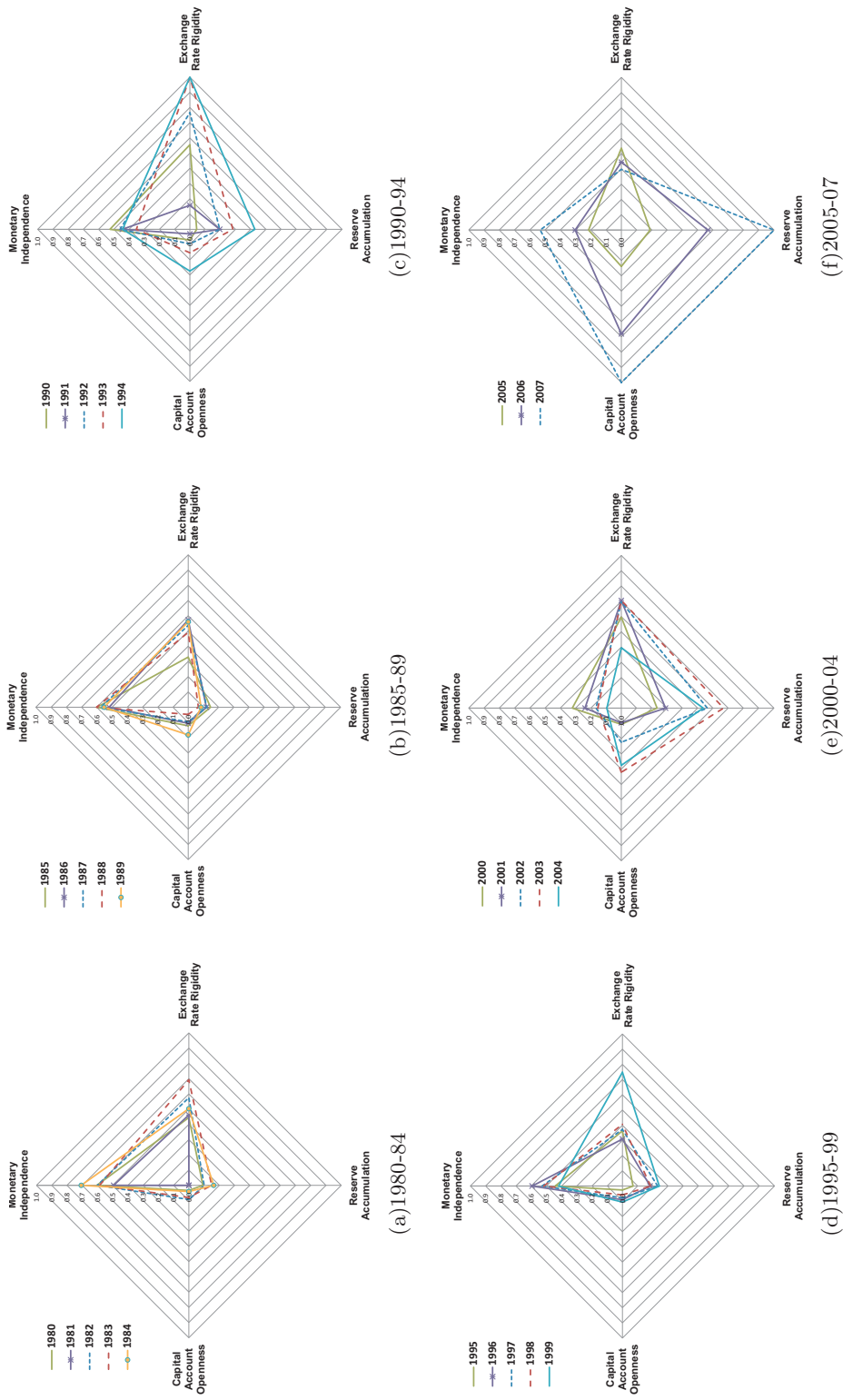


Figure 8: Configurations of Trilemma and International Reserves

Source: Author's calculation

During the period 1993 to 1995, India witnessed its first surge of capital inflows. As [Joshi \(2003\)](#) argues the surge in capital flows was assisted by pull factor including newer profit opportunities arising due to the economic reforms and the push factor of lower global interest rates. FII inflows increased more than seven times from \$307 million in July to September 1993 to \$2.3 billion during January to March 1994. Net capital inflow of over \$9 billion during 1993 – 94 and 1994 – 95 was three times that of previous years. As a result of these flows, the policymakers were faced with a choice of either allowing nominal exchange rate to appreciate, thereby giving up exchange rate stability or fixing the exchange rate and allowing the money supply to change, thereby relinquishing monetary independence. The Indian authorities chose to give up monetary independence in favour of exchange rate stability. In fact, the exchange rate remained steady at Rs. 31.4 per dollar from April 1993 to August 1995. This leads to an ERR index of close to one for the years 1993, 1994 and 1995. India's reserve holdings more than doubled from less than \$12 billion in July 1993 to \$24 billion in October 1994. This is also reflected in the index for reserve accumulation, which jumped from being in range of 0 to 0.16 in the 1980s to 0.28 and 0.43 in 1993 and 1994, respectively. Due to paucity of instruments and an illiquid bond market, the RBI could not sterilize these foreign inflows and there was a sharp increase in money supply. Consequently, the money supply growth rate surged to 20 percent in late 1994 and contributed to a rapid rise in inflation. The loss of monetary independence is reflected in [Figure 8\(c\)](#) with a drop in the index to 0.35 in 1993 and 0.44 in 1994 from an average of 0.58 in the 1980s.

In the second half of the 1990s there was a reversal in the situation as a number of international events put a downward pressure on the exchange rate. The reforms of the early 1990s started having an impact and the Indian economy moved from an average rate of growth of 5.3% during 1980 to 1994 to grow at 6.4%, 7.3% and 8.0% in the next three years. However, this was associated with a rise in current account deficit as there was an increase in demand for imports. Simultaneously, the Mexican crisis in 1995 resulted in a reduction in capital inflows indicated by a drop in the capital account openness index to 0.07 in 1995 and 0.18 in 1996. The authorities allowed a moderate depreciation of the Rupee leading to a decline in the exchange rate rigidity index, which stood at 0.31 and 0.37 in 1995 and 1996. Flexibility in the exchange rate regime allowed the authorities to reassert monetary independence, which rose to 0.59 in 1996.

During 1997 to 2001 India continue to experience limited capital inflows due to a number of domestic and external factors. In 1997 and 1998 inflow of foreign capital into India was adversely affected following contagion from countries in East Asia and Latin America, which were impacted by a series of financial crisis. The inflow of capital was also affected due to economic

sanctions imposed on India after it had conducted nuclear tests in May 1998. Furthermore, this was also a period of political instability as the country faced three general elections and four prime ministers between 1996 and 1999. Finally, in the developed countries there was a decline in economic activity due to the bursting of the dotcom bubble. As a result of these factors, net capital inflows, which were around \$12 billion in 1996 continued to decline over the next few years, and managed to exceed this level only in 2003. The reduction in capital flows is also described by a drop in the capital account openness index in this period, which as can be seen in Figures 8(d) and 8(e) stayed within the range of 0.06 and 0.22 between 1997 and 2002.

The decline in capital flows resulted in a moderate depreciation of the Indian Rupee, with the exchange rate rigidity index dropping to 0.37 and 0.38 in 1997 and 1998. Over the next few years, the RBI tried to maintain a stable real effective exchange rate by inducing a modest depreciation against the US Dollar to offset the inflation differential. This gets reflected in the exchange rate rigidity index, which remained in a range between 0.6 and 0.75.

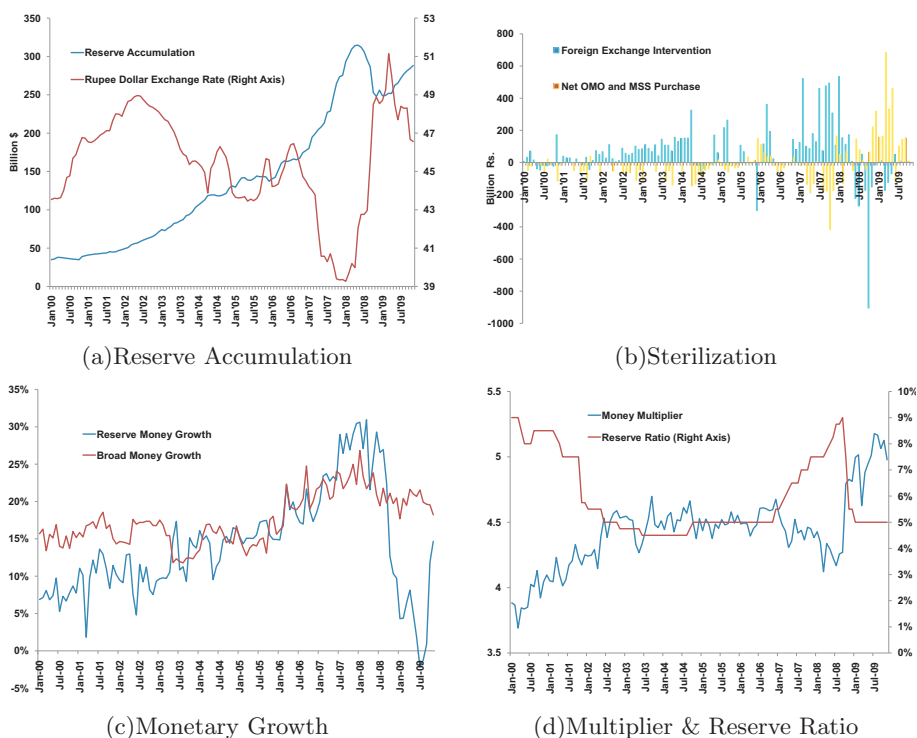
The various policy trade-offs under the impossible trinity got exacerbated since 2003 due to a surge in capital inflows. Net capital inflows increased from around \$10 billion in 1999 and 2000 to \$16 billion in 2003 and further to \$22 billion in 2004. Consequently, the capital account openness index rose to 0.42 and 0.38 in 2003 and 2004. To prevent the Rupee from appreciating rapidly, the RBI heavily intervened in the foreign exchange market. Figures 9(a) and 9(b) indicate that between January 2001 and April 2004, the RBI purchased more \$62 billion of foreign exchange. To prevent this intervention from leading to a sharp increase in monetary base, the RBI resorted to sterilization. It reduced its holding of government bonds and its stock of net domestic assets declined from Rs. 1.9 trillion in April 2001 to Rs. 0.19 trillion in April 2004. Thus as can be seen in Figure 9(c) in the early part of 2000s the increase in net foreign assets was matched by a decline in net domestic assets, and the growth in reserve money was relatively stable. The successful sterilization during this period meant that the RBI managed to have a stable exchange rate against the US Dollar. Thus throughout 2001 to 2003 the exchange rate rigidity index takes a value of 0.70.

Towards late 2003, the RBI started to run out of government bonds for sterilization, and in January 2004, a new instrument for sterilization - Market Stabilization Scheme (MSS) bonds - was introduced. The RBI sold these MSS bonds on the behalf of the government to sterilize the impact of capital inflows. By August 2005, the amount of outstanding MSS bonds increased to Rs. 0.71 trillion. However, with a rising amount of outstanding MSS bonds, the fiscal cost of sterilization became a worrisome issue.⁶

scal cost since the interest rate on these sterilization bonds tend to be higher than that earned on foreign assets. Consequently, the RBI resorted to in-

complete sterilization of the capital flows, which led to an increase in the growth rate of reserve money. In addition, it reduced its intervention in the foreign exchange market, which led to the Rupee appreciating by 6.5% between August 2004 and July 2005. As a result, the exchange rate rigidity index dropped to 0.4 and 0.53 in 2004 and 2005, respectively (Figure 8(f)).

Figure 9: Reserve Accumulation and Sterilization



Source: Handbook of Statistics 2010, RBI

In 2006 and 2007, the surge in capital flow accelerated and the capital account registered a surplus of \$38 billion and \$94.3 billion, respectively. Bulk of this amount came in the form of portfolio investment in the Indian equity market, commercial borrowing by the private sector and short term credit to India. This resulted in the BSE Sensex increasing by 43% in 2006 and 47% in 2007 and external debt increasing from \$132 billion in end 2005 to \$160 billion by end of 2006 and further to \$206 billion in 2007. The RBI tried to achieve an intermediate regime in an attempt to manage the impossible trinity. It introduced a number of measures in 2007 to limit capital flows. These included imposing restrictions on ECBs in August 2007 by allowing ECBs of over \$20 million only if the expenditure was to be done in foreign currency, and the funds could not be remitted to India. In the case of ECBs less than \$20 million, funds could be raised for Rupee expenditure, but the funds would have to be parked overseas until actual requirement in India.

Furthermore, in October 2007, the Securities and Exchange Board of India (SEBI) restricted the use of Participatory Notes (PNs) by imposing ceilings on PNs and restrictions on FIIs.⁷ In December 2007, the RBI introduced measures to limit loans to both foreign and domestically held mutual funds operating in India. The measures included considering these loans as direct investments in stock and bond instruments in the calculation of a banks capital adequacy ratio, and by restricting banks investment in stocks and bonds to 40% of its net worth. However, none of these measures were very effective as capital continued to pour in to the country.

In an attempt to retain some degree of monetary independence, fresh MSS bonds were issued to sterilize the foreign exchange purchases, despite the growing fiscal cost. The outstanding stock of MSS bonds increased by Rs. 1.4 trillion between January and December 2007. Despite this sharp increase in issuance of MSS bonds, the RBI was not able to completely sterilize the foreign inflows as the RBI purchased over \$75 billion or about Rs. 3.0 trillion during this period. To suck in some of this liquidity that was being injected, the Cash Reserve Ratio (CRR) was raised by 200 basis points during 2007 (Figure 9(d)).

Finally, the Rupee was allowed to appreciate significantly over this period. While the Rupee appreciated against the Dollar by 12% over this period, the trade weighted REER appreciated by 5%. Such a rapid rate of appreciation was unprecedented in the post liberalization era.

With the outbreak of the sub-prime crisis in the United States and the ‘flight to safety’ of foreign capital from emerging markets, capital started owing out of the Indian economy late 2007, which continued till early 2009. Capital flow to emerging markets resumed in early 2009, with India receiving net capital inflows of \$43 billion during April to December 2009, compared to only \$5.8 billion in 2008. This resurgence in capital flow has once again forced India to make some tough policy choices.

The RBI has tried to curb the inflow of capital by introducing certain restrictions. The all-in-cost ceilings, which were withdrawn in January 2009, to encourage ECBs, were reimposed in December 2009. In fact the reimposed ceilings were higher by 100 to 150 basis points from the pre-crisis levels. In addition, foreign currency convertible buybacks were discontinued. The Rupee was also allowed to appreciate in the face of strong capital flows. It appreciated by nearly 17.5% between March 2009 and April 2010. Even, the 36 currency NEER appreciated by more than 9.3%.

Interestingly, the RBI has refrained from intervening in the foreign exchange market to mitigate the pressures of appreciation. Between March 2009 and

⁷Participatory Notes are instruments used by investors or hedge funds, which are not registered with SEBI to invest in Indian equity market.

November 2009, the RBI actually sold more than \$6 billion of reserves. Reluctance to intervene and sterilize can be attributed to RBI's preoccupation to manage record borrowing requirements of the government in 2009 – 10 and 2010 – 11. Sterilization of inflows can result in driving the interest rates up, which will have negative consequences for government borrowing. Furthermore, incomplete sterilization of the inflows would increase the money supply and exacerbate inflationary pressure, which the RBI is keen to prevent with inflation crossing 10% in March 2010. Finally, a strong currency is going to help moderate inflation by reducing the cost of importables. However, RBI has left the option of sterilization in the future open by agreeing to replenish the MSS bonds to the tune of Rs. 500 billion. A further increase in inflows may be countered by the use of these bonds.

6 Conclusion

There is now an emerging consensus that countries need to actively manage their capital account to avoid vulnerabilities associated with financial crisis. While it is widely agreed that capital flows aid growth by providing external capital to sustain an excess of investment over domestic savings, in recent years, many emerging markets, including India, have received capital flows that are far greater than their current account financing requirements creating macroeconomic management challenges. In such cases, excess capital flows tends to feed into real exchange rate misalignment, excesses in credit market, asset price booms, building up of inflationary pressure and overall financial fragility. This brings in the need to actively manage capital flows. While capital controls can be effective they are generally not fool-proof, and are vulnerable to leakages through financial engineering. In such circumstances, a gamut of policy measures has to be used to ensure financial stability of the economy. These would include exchange rate flexibility, holding of adequate reserves, intervention in the foreign exchange market, and overall development of the financial sector.

India has also resorted to the multiple instrument approach while dealing with capital flows. The overall policy architecture encompassed active management of capital flows, especially volatile and debt flows; a moderately flexible exchange rate regime with the RBI intervening at times to prevent excessive volatility; sterilization of these interventions through multiple instruments like MSS bonds and CRR; and building up of a stockpile of reserves. This approach has suited India well as it has been able to maintain a healthy growth rate, targeted monetary and credit growth rate, moderate inflation rate through most of the period and a sustainable current account deficit.

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