India's experience with capital flows

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Abstract

In the late 1980s, India pursued autarkic trade policies, fixed exchange rates, stifled the capital account, and financed current account deficits using debt and official flows. India experienced BOP crises in 1981 and 1991. From the early 1990s, India shifted to a policy framework comprising an open current account, a pegged exchange rate, restricted debt inflows, an open capital account for foreign investors, and FDI flows for foreign and domestic firms.

This policy mix has led to an increase in trade integration and in financial integration. Domestic institutional factors have led to larger portfolio flows as compared with FDI. Currency expectations have influenced capital flows. Many tactical details of the intricate reforms to the capital controls derive from the interlocking relationships between monetary policy, the currency regime and capital flows. In the recent period, pegging has given a capital outflow through reserves accumulation which was larger than the substantial net private capital inflows.

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1 Introduction

Indian economic policy witnessed a marked shift following a balance of payments crisis in 1991. Prior to this, India had an "LDC style" composition of capital flows, where current account deficits were financed using official flows and debt flows. As in other countries that were liberalising capital flows in this period, the conceptual framework underlying the reforms consisted of arguments about India's experience with volatile debt flows, views about the sustainability of debt flows, and views about a desirable composition of flows.

The new approach, which has been broadly stable from 1992 till 2004, consisted of liberalising the current account, opening up to FDI for domestic and foreign firms, opening up to portfolio flows for foreigners, and restricting debt flows. The currency regime was shifted away from a fixed exchange rate to a peg to the USD.

Indian capital controls consist of an intricate web of a very large number of quantitative restrictions, controlled and operated by a substantial bureaucratic apparatus. Liberalisation of FDI and portfolio flows was done in a gradual manner, with a large number of incremental and partial changes to the large number of rules. While some major decisions were taken in 1992, there has been a continual process, which continues even in 2004, of changing restrictions in small and intricate steps.

Liberalisation of the current account has been highly successful. Positive technology shocks and dropping prices of international telecommunications helped India obtain high growth rates of services exports. The removal of quantitative restrictions, and the sharp drop in tariffs, served to spur both imports and exports. Through these, gross flows on the current account rose from 25 per cent of GDP in 1992-93 to 35 per cent in 2003-04.

Major changes took place on the capital account also. Net capital inflows through debt stayed at roughly 1 per cent of GDP between 1992-93 and 2003-04. Owing to the debt-aversion of the policy framework, gross debt flows actually dropped from 13.5% of GDP in 1992-93 to 10.6% in 2003-04. Official flows faded into economic insignificance.

Net FDI flows into India have remained small, either when compared with Indian GDP or when compared to global FDI flows. In contrast with the Chinese experience, relatively little FDI has come into India in setting up factories which are parts of global production chains. This may be associated with infirmities of Indian indirect taxes and transportation infrastructure. India is more important as a platform for services production as a part of global production chains, where difficulties of indirect taxes and transportation infrastructure are less important. However, services production is less

capital intensive, and induces smaller net FDI flows.

Given the size of the Indian economy, and the relative lack of correlation with the global business cycle, Indian equities have had low correlations with global risk factors. In addition, India has fared well in creating the institutional mechanisms of a modern, liquid equity market. Through these factors, portfolio flows have predominated. India's share in global portfolio flows is higher than India's share in global FDI flows, and net portfolio flows are substantial when compared to Indian GDP.

In many countries, there has been a close interplay between foreign investment and growth in trade. India has increased it's share in world trade without having substantial FDI. One part of an explanation lies in the low capital intensity of export-oriented production. Another aspect is the initial conditions, which consisted of a strong set of domestic firms. Portfolio flows have fed into these domestic firms, which have gone on to obtain growth in exports. The growth of domestic firms has been assisted by relaxations of capital controls which enabled them to engage in outbound FDI, which has served to diminish the size of net FDI flows.

While portfolio flows are sometimes considered volatile, in India's experience, there has been no episode of a significant retreat by foreign investors. Net FDI and net portfolio flows have been fairly stable. Debt flows have been highly volatile, reflecting numerous changes in capital controls applicable on debt flows, and changing currency expectations.

Through these policy initiatives, gross flows on the capital account grew from 15% of GDP in 1992-93 to 20% of GDP in 2003-04, along with sharp changes in the composition of flows. In 2003-04, gross portfolio flows amounted to as much as 7% of GDP.

The growth of the capital account, and the shift towards less government control of the flows, generated increasing difficulties in terms reconciling currency policy and monetary policy autonomy with the effectively open capital account. Speculative views of the currency were increasingly expressed by economic agents in many ways. Barriers to debt flows blocked currency speculation through debt. This led to incentives for currency views being expressed through the other channels of openness available. For example, in this paper, we find that currency expectations were important in explaining the predominantly equity-oriented portfolio flows.

This generated difficulties in implementing the currency regime which had not been experienced prior to liberalisation of the capital account. Resolving these tensions became the defining issue for macro policy over the last decade.

From late 2001 to early 2004, the implementation of the currency regime

led to a sharp rise in reserves from $40 billion to $115 billion. This led to a substantial outward flow of capital. In 2003-04, net capital inflows of $21 billion were accompanied by addition to reserves of $31 billion. Through this, India ran a current account surplus.

India's approach of gradual liberalisation of the capital account has thus worked well in many ways. India has reaped microeconomic benefits of an open current account, and from FDI and portfolio flows. India has encountered no BOP crisis in the post-1992 period. At the same time, the size of FDI flows is disappointingly small. There have been episodes where monetary policy autonomy was significantly attenuated in the implementation of the currency regime. One key element of India's original policy quest - the search for a sustainable framework for augmenting investment through current account deficits - has as yet not been achieved.

In this paper, we explore the causes and consequences of the major empirical features of India's experience with capital flows. The paper begins with the broad empirical features (Section 2). We review the historical evolution of the currency regime (Section 3) and capital controls (Section 4). We examine FDI and portfolio flows in Section 5, where we also explore the interplay between currency expectations and portfolio flows. Section 6 turns to official flows. We closely examine 2003-04, where a spurt in capital inflows was accompanied by $31 billion of outward flows through reserves accumulation. Finally, in Section 7 and Section 8, we discuss some implications of the present framework of capital flows for contemporary macroeconomic policy issues.

		1992-93	2003-04	Growth	1992-93	2003-04
		Billion USD		Percent	Percent to GDP	
GDP at market prices		239.09	639.90	9.36		
Current account (net)		-3.53	10.56		-1.47	1.65
Merchandise	*outflows*	24.32	80.18	11.46	10.17	12.53
	inflows	18.87	64.72	11.86	7.89	10.11
Invisibles	*outflows*	7.41	26.97	12.46	3.10	4.21
	inflows	9.33	52.98	17.10	3.90	8.28
Capital account (net)		3.88	20.54	16.37	1.62	3.21
Official flows	*outflows*	2.66	6.46	8.40	1.11	1.01
	inflows	4.92	3.34	-3.47	2.06	0.52
FDI	*outflows*	0.03	1.47	42.42	0.01	0.23
	inflows	0.34	4.89	27.25	0.14	0.76
Portfolio equity	*outflows*	0.00	16.86	127.46	0.00	2.64
	inflows	0.24	28.22	54.01	0.10	4.41
Debt	*outflows*	14.99	31.01	6.83	6.27	4.85
	inflows	17.37	37.14	7.15	7.26	5.80
Miscellaneous	*outflows*	2.34	2.27	-0.27	0.98	0.35
	inflows	1.36	5.35	13.26	0.57	0.84
Reserves at year-end		6.43	107.45	29.17	2.69	16.79
Addition to reserves		0.70	31.42	41.35	0.29	4.91
Metric of integration		96.60	352.05	12.47	40.40	55.02
Trade integration		59.93	224.85	12.77	25.07	35.14
Financial integration		36.67	127.20	11.97	15.34	19.88

"Official flows" comprise external assistance, rupee debt service with respect to Russia, and IMF-related monetary movements. "Debt" comprises commercial borrowings, short term loans and banking capital. "Miscellaneous" is the sum of "Other capital flows" and errors & omissions.
The Indian fiscal year runs from April to March, so 2003-04 runs from 1 April 2003 to 31 March 2004.

Table 1: Indian capital flows: 1992-93 versus 2003-04

2 Broad empirical features

Broad facts about Indian capital flows are presented in Table 1, which shows two years: 1992-93 and 2003-04. The year 1992-93 was chosen since it reflects the last year of "the previous regime" of highly restricted capital flows.[1] The year 2003-04 is the most-recent year observed.

GDP. Over this 11 year period, GDP in current dollars grew by an average of 9.4 per cent per annum.

[1]Significant capital flows through FDI and portfolio investment commenced in 1993-94, which justifies the choice of 1992-93 as the last year of the previous policy regime.

The year-end exchange rate used for 1992-93 incorporates the sharp devaluation which took place when the rupee became a 'market determined exchange rate' in 1992. Hence, 1992-93 is also the first year for which it is meaningful to convert between rupees and dollars, e.g. for the purposes of re-expressing GDP in USD.

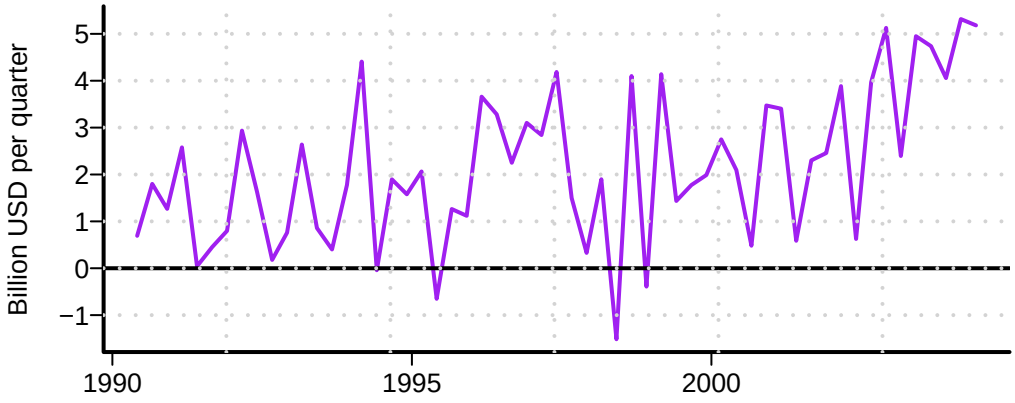

Figure 1: Net capital flows (quarterly time-series)

Current account. India undertook major initiatives in trade liberalisation in this period (Panagariya 2005, forthcoming). This led to growth rates of roughly 12 per cent per annum in imports and exports of merchandise, and imports of invisibles. The dropping prices of global telecommunications led to an increase in services exports from India, giving a higher invisibles export growth rate of 17 per cent per annum. Putting these together, trade integration (measured as gross current account flows as percent to GDP) rose sharply from 25.1 per cent of GDP in 1992-93 to 35.1 per cent of GDP in 2003-04 : an increase of 10 percentage points in 11 years. In addition, over this period, the current account switched from a deficit of 1.5 per cent of GDP to a surplus of 1.7 per cent of GDP.

Net capital flows. On the surface, net capital flows appear to have changed little, from 1.6 per cent of GDP in 1992-93 to 3.2 per cent of GDP in 2003-04 (see Figure 1). Yet, major changes took place on the capital account. In 1992-93, which reflects the previous policy regime, the capital account was dominated by official flows and debt flows. Over this 11 year period, net official flows switched from +0.9 per cent of GDP to -0.5 per cent, and net debt flows were stable at 1 per cent of GDP.

FDI and portfolio investment. Major growth was seen in FDI and portfolio investment. Gross flows through these two channels grew sharply from 0.3 per cent of GDP to 8 per cent of GDP. The average annual growth rate of net FDI flows was 24.2 per cent and that for net portfolio flows was 41.9 per cent. Over this period, India switched from "LDC style" capital flows, emphasising official flows and debt, to an "emerging market style" structure of capital flows, emphasising FDI and portfolio investment. Through these changes, gross flows on the capital account were higher by 4.5 per cent of GDP in 2003-04, to reach 19.9 per cent of GDP.

In 2003-04, net flows through portfolio investment were 3.3 times larger than net FDI flows. The impact of portfolio flows on *gross* flows on the capital account is higher, as portfolio flows involve larger two-way flows of capital. In 2003-04, FDI inflows were 3.33 times bigger than FDI outflows, but portfolio inflows were only

	USD	GBP	EUR	JPY
INR	0.277	0.634	0.778	0.848
USD		0.588	0.738	0.836
GBP			0.601	0.896
EUR				0.932

Table 2: Cross-currency volatility (daily returns, 8/1992 - 11/2004)

1.67 times bigger than portfolio outflows. Hence, gross portfolio flows in 2003-04 amounted to 7 per cent of GDP, while gross FDI flows amounted to only 1 per cent of GDP.

Financial integration. The sum of gross flows on the current and capital account serves as an overall metric of integration into the world economy. This rose by 14.6 percentage points over this 11-year period, from 40.4 per cent in 1992-93 to 55 per cent in 2003-04.

Outward flows. These changes were accompanied by a substantial outward flow of capital through purchases of foreign exchange reserves. The year-end reserves rose sharply from 2.7 per cent of GDP in 1992-93 to 16.8 per cent of GDP in 2003-04. In 2003-04 alone, the addition to reserves was 4.9 per cent of GDP. In this year, net capital flows of $20.5 billion, and a current account surplus of $10.6 billion, were associated with an addition to reserves of $31.4 billion.

This data and description suggests that the two major features of India's experience with capital flows have been:

- Rapid growth of foreign investment, accompanied by slow growth of debt flows. Portfolio flows witnessed the highest growth.
- A substantial extent of outward flows through reserves accumulation.

This paper aims to shed some light on the causes and consequences of these major features.

3 Currency regime

In India, there has been a rich interplay between policies and outcomes on capital flows and the currency regime. According to the RBI, the Indian rupee is a "market determined exchange rate", in the sense that there is a currency market and the exchange rate is not administratively determined. India has clearly moved away from fixed exchange rates. However, RBI actively trades on the market, with the goal of "containing volatility", and influencing the market price. The tension induced by the impossible trinity, between openness on capital flows and the implementation of the currency regime, is a central feature of India's experience with capital flows.

Parameter	Coefficient
$d\log\left(\frac{\text{USD}}{\text{CHF}}\right)$	0.9345
	(72.73)
$d\log\left(\frac{\text{JPY}}{\text{CHF}}\right)$	0.0519
	(6.47)
$d\log\left(\frac{\text{EUR}}{\text{CHF}}\right)$	-0.0134
	(-0.7)
$d\log\left(\frac{\text{GBP}}{\text{CHF}}\right)$	0.0186
	(1.27)
Intercept	0.0151
	(2.46)
T	2854
R^2	0.8745
σ_ϵ^2	0.08

Table 3: Frankel-Wei regression (daily returns, 8/1992 - 11/2004)

In India, as in most developing countries, there has been a distinction between the *de facto* and the *de jure* currency regime. Patnaik (2003) argues that there is a *de facto* pegged exchange rate, for the following reasons:

- There is extremely low volatility of the INR/USD exchange rate alongside high volatilities of other exchange rates such as the INR/Euro and INR/Yen. Table 2 shows that the volatility of daily returns on the INR/USD has been 0.277, while (say) the volatility of the INR/JPY has been 0.848. The latter value is remarkably close to the USD/JPY volatility of 0.836. In the polar case where the INR/USD were a fixed exchange, the INR/JPY volatility would be exactly equal to the USD/JPY volatility. Volatilities of the rupee against the GBP, EUR and JPY take on large values, similar to those of floating exchange rates such as the USD/EUR or the EUR/GBP.
- Tests based on Frankel & Wei (1994) show that the USD is overwhelmingly the dominant currency in explaining fluctuations of the Indian currency (Table 3).[2] The coefficient of the USD/CHF returns

[2] Frankel & Wei (1994) developed a regression based approach for testing for pegging. In this approach, an independent currency, such as the Swiss Franc (CHF), is chosen as a 'numeraire'. The model estimated is:

$$d\log\left(\frac{\text{INR}}{\text{CHF}}\right) = \beta_1 + \beta_2 d\log\left(\frac{\text{USD}}{\text{CHF}}\right) + \beta_3 d\log\left(\frac{\text{JPY}}{\text{CHF}}\right) + \beta_4 d\log\left(\frac{\text{DEM}}{\text{CHF}}\right) + \epsilon$$

This regression picks up the extent to which the INR/CHF rate fluctuates in response

is 0.9345, which is near 1, while other coefficients are near 0. The R^2 of this regression is 87.45%. These facts are consistent with a pegged exchange rate regime.

- India's enormous reserves buildup after mid-2002 cannot be explained by a quest for reserves as insurance.
- Extending the Calvo & Reinhart (2002) λ metric of currency flexibility beyond 1999 shows that there has been no change in this metric over 1979-2003.

The *extent* of pegging has varied through this period. There have been multi-month periods where the INR/USD exchange rate was fixed, and there have been periods where the volatility of the INR/USD was closer to that of the INR/EUR or the INR/JPY. The facts shown above represent the average behaviour over the period from 8/1992 to 11/2004.

4 Capital controls

4.1 Evolution of capital controls

Foreign investors – other than those of Indian origin – are prohibited from investing in financial assets in India. These prohibitions were eased for "foreign institutional investors" (FIIs) on 14 September 1992, with permissions to invest in all securities. Limits were placed where no one FII could own more than 5% of a company, and all FIIs (put together) could not own more than 24% of a company.

From 1992 onwards, restrictions on portfolio have been steadily eased, while preserving sharp constraints on bond investments. Portfolio investors are now able to trade in the spot and derivative markets for both equities and currency.

While considerable openness on FDI exists, there are restrictions on foreign ownership in certain industries. For example, the foreign company engaging in FDI in insurance is limited to a 26% ownership. Another major constraint influencing FDI is "Press Note 18", whereby a foreign firm which wishes to start a second project in India is required to take approval of its first domestic partner.

to fluctuations in the USD/CHF rate. If there is pegging to the USD, then fluctuations in the JPY and DEM will be irrelevant, and we will observe $\beta_3 = \beta_4 = 0$ while $\beta_2 = 1$. If there is no pegging, then all the three coefficients will be different from 0. The R^2 of this regression is also of interest; values near 1 would suggest reduced exchange rate flexibility.

4.2 Restrictions on CIP arbitrage

One element of the capital controls consists of barriers to arbitrage on the currency forward market. In a normal forward market, arbitrage and only arbitrage defines the forward rate. Even if there are strong speculative views and positions on the market, there is no interesting interpretation that can be attached to the level of the forward premium, since this is purely determined by covered interest parity (CIP).[3] When violations of market efficiency arise, near-infinite capital comes into play in arbitrage. Through this process, arbitrageurs restore market efficiency, and push the forward price back to fair value.

In India, banking regulations place sharp restrictions upon the ability of banks to engage in CIP arbitrage. This serves to break the link between the spot and the derivative.[4] At the same time, the empirical experience with RBI's trading shows that while RBI trades extensively on the spot market, the observed forward price tends to be a market determined rate.

The rules that inhibit covered interest parity arbitrage constitute an element of the system of capital controls in place. As argued in Patnaik (2005, forthcoming), restrictions on CIP arbitrage coupled with a relatively undistorted forward market have generated a remarkable information source as a side effect.

When arbitrage does *not* determine prices, information from the forward market conveys expectations about the future. If economic agents expect the rupee to depreciate, there would be a greater interest in selling rupees forward – exporters would stay unhedged, and importers would be likely to hedge. Conversely, if economic agents expect the rupee to appreciate, there would be greater interest in buying rupees forward while those expecting to import would stay unhedged. Lacking adequate arbitrage capital, the forward price does not get restored to the fair value. The error between the fair value of the forward premium, and the observed value on the market, serves as a measure of the *speculative* views in the market about the future course of the currency.

[3]The arithmetic of forward pricing in an efficient market is based on 'covered interest parity'. Covered interest parity involves comparing two routes for riskless USD investment. An investor could convert \$1 into $(1 + r_u)^T$ through r_u, which is obtained from the US zero coupon yield curve for T years. Alternatively, the investor could convert into INR at the spot price S, invest in the GOI zero coupon yield curve and obtain a locked-in cashflow of $S(1 + r_i)^T/F$ by converting back into USD at the rate F at date T. Under no-arbitrage, these two investment strategies have to yield an identical return, through which the fair value for F can be computed.

[4]Currency derivatives can either trade OTC or on exchange. In India, trading of currency derivatives on exchange is infeasible owing to legal difficulties. Hence, our treatment is limited to currency forwards and does not utilise data from a currency futures market.

Figure 2: Error between actual and fair value of INR/USD forward premium

If arbitrage was unrestricted, the forward premium would be non-informative. Under the existing policy framework, it is a uniquely useful market-based measure of future expectations; one that is not available in most countries where regulators do not inhibit arbitrage.[5]

Internationally, empirical research related to currency expectations uses data based on surveys (Frankel & Okongwu 1996). Market participants, central bankers, multinational companies and economics departments of banks are interviewed on a weekly/monthly frequency. Survey data such as the *Currency Forecasters' Digest*, now known as the *Financial Times Currency Forecast*, forms the basis for a number of papers in the field (Chinn & Frankel 1994).

No such data is available for India. However, the daily data on the error term that can be obtained from the forward market acts as unique high frequency source of information about currency expectations. As shown in Figure 2 in the INR/USD forward market deviations from the covered parity conditions have tended to persist over multi-month periods. In an open market, arbitrage would have wiped out such deviations almost instantly.

Figure 2 shows a period from 1993-95 where the CIP error was positive, where the market expected a rupee appreciation. In the period after the East Asian Crisis and India's nuclear tests, there were expectations of a currency depreciation. From 2002 onwards, there were expectations of a

[5]Apart from conveying expectations of the market, the error between the observed forward premium and its fair value also shows the arbitrage opportunity available to the few economic agents who are permitted to engage in the trading required for doing CIP arbitrage.

rupee appreciation.

Offshore cash-settled forwards, named "Non-deliverable forwards" (NDF) markets" exist on the Indian rupee. However, the mere existence of a currency forward market outside the reach of domestic currency controls is not enough to generate informative prices in the sense of a forward market that is immune to CIP. The essential and unique feature of India's forward market is the restrictions upon CIP arbitrage. If (for example) a forward market existed outside the country, but if arbitrage were feasible, then it would also obey CIP and the prices observed there would be non-informative.

4.3 Capital controls prevalent as of late 2004

The present state of capital controls may be summarised as follows:

Current account There are no current account restrictions, other than the limit upon individuals of purchasing no more than $10,000 per year for the purpose of foreign travel.

Restrictions upon the currency market Market access to the currency market is severely restricted, primarily to banks. Only economic agents with a direct current account or capital account exposure are permitted to trade in the market. Exchange traded currency derivatives are absent. Importers/exporters face binding restrictions on the size of their currency forward positions.

Outward flows by individuals Individuals are limited to taking $25,000 per year out of the country.

Outward flows by firms Firms are limited to taking capital out of the country which is equal to their net worth.

Borrowing by firms External borrowing by firms must be of atleast 3 years maturity below $20 million and of atleast 5 years maturity beyond. Borrowing upto $500 million by a firm "for certain specified end-users" – e.g. expanding a factory, or importing capital goods – is allowed without requiring permissions. There is a ceiling whereby approvals for borrowing by all firms (put together), in a year, should not exceed $9 billion per year. This ceiling has never been reached.

Firms are "required to hedge their currency exposure", but there is no mechanism for verifying this, and substantial restrictions on their activities on the currency forward market are in place.

Borrowing by banks The central bank controls the interest rate at which

banks borrow from foreigners through "nonresident deposits".[6]

Generic restrictions upon portfolio flows Only "foreign institutional investors" are permitted to invest in the country.

Debt investment by foreign portfolio investors The aggregate investment in government bonds by all foreign investors cannot exceed $1.75 billion. The aggregate bond investments by any one fund cannot exceed 30%. The total corporate bond ownership by all foreign investors cannot exceed $0.5 billion.

Equity investments by foreign portfolio investors The aggregate foreign holding in a company is subject to a limit that can be set by the shareholders of the company. This limit is, in turn, subject to "sectoral limits" which apply in certain sectors. No one foreign portfolio investor can own more than 10% of a company. Foreign ownership in certain sectors (telecom, insurance, banking) is capped at various levels. Firms are free to issue GDRs/ADRs outside the country, which can be sold to a broad swathe of global investors. Within these restrictions, foreign investors are fully able to convert currency, hedge currency risk, and trade in the equity spot or derivatives markets.

FDI Foreign ownership in certain sectors (telecom, insurance, banking) is capped at various levels. Foreign companies require approval of the first firm they chose to do a joint venture with in the country, if they wish to start a related business.

5 Investment flows

5.1 FDI

Figure 3 shows the time-series of quarterly flows of FDI. In order to aid comparability, it has the same scale as Figures 1 and 4.

In many countries, high exports growth has been strongly associated with FDI. India's share in world trade of both goods and services has been increasing, without having high FDI. Two elements of an explanation might be:

Labour intensive exports This may partly reflect the higher extent to which FDI into India has emphasised labour-intensive economic activities, such as services exports. As an example, call centres have a capital output ratio of just 0.75.[7]

[6] Gordon & Gupta (2004) analyses the determinants of nonresident deposits.

[7] The rough financial structure of a 1000-seat call centre, as of 2004, is as follows. The

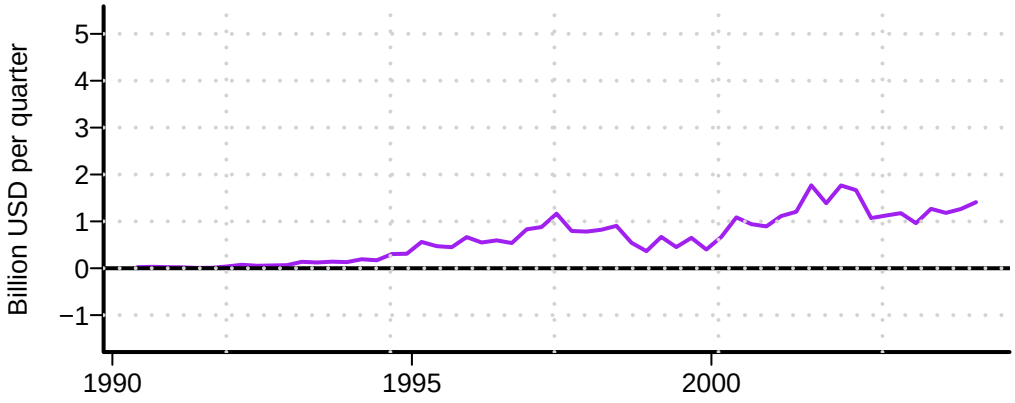

Figure 3: Net FDI flows (quarterly time-series)

Strength of domestic firms Unlike many emerging markets or transition economies, India had a strong set of domestic firms in place by the 1990s. A steady flow of startups and IPOs has fueled a large domestic corporate sector. These domestic firms were able to engage in export-oriented activities, as opposed to the higher reliance seen in other countries, upon foreign firms who would first bring in FDI and then export. In India's case, the role of foreign capital flows has worked, to a greater extent, through portfolio flows into the domestic equity market, to domestic firms, and thus to exports growth.

Domestic firms have been given an increasingly liberal framework for outward FDI flows, so that they can become multinational corporations. In 2003-04, gross FDI inflows of $4.89 billion were accompanied by gross outflows of $1.47 billion. Offshore investments by Indian firms made up part of the latter. To this extent, Indian data shows lower net FDI flows.

5.2 Portfolio flows

Figure 4 shows the time-series of quarterly portfolio flows. In order to aid comparability, it has the same scale as Figures 1 and 3. India's share of world portfolio flows considerably exceeds India's share in world FDI flows.

The rationale for including securities from a given country into global port-

project cost is roughly $15 million, of which $10 million is fixed capital (excluding real estate). The annual revenue works out to roughly $25 million, of which the value added is roughly $20 million.

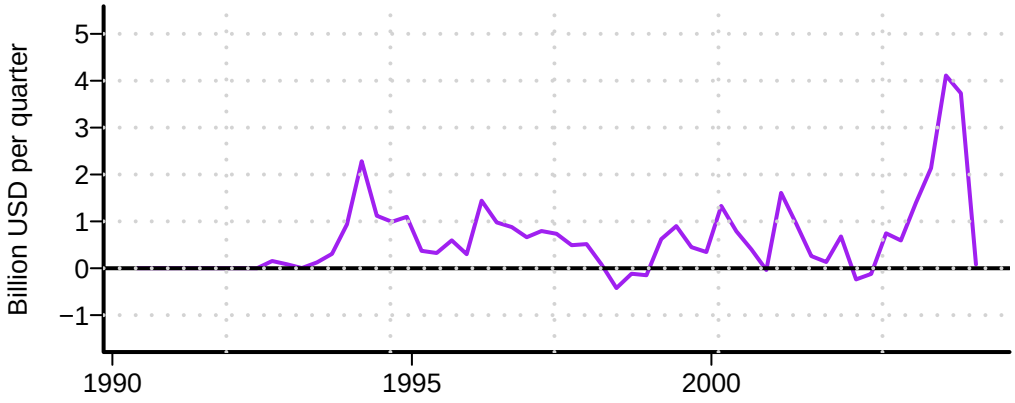

Figure 4: Net portfolio flows (quarterly time-series)

folios is based on the improvements in diversification obtained therein. At the same time, a strong problem that is well known in the literature is that of the "home bias", where individual and institutional portfolios tend to hold higher weights of local country securities. In the literature, home bias is believed to be related to informational asymmetries and transactions costs. For example, Portes & Rey (2001) find that the geography of information – rather than the quest for efficient portfolios through diversification – dominates patterns of cross-border equity flows.

India had many strengths in these issues as of the early 1990s. India was a large economy. As of 10/2004, the market capitalisation of the equity market was $335 billion. In addition, India had low trade integration, and hence had low correlations of the equity index against global indexes. Some correlations of weekly returns, in the period from 10/1995 to 2/2004, are in Table 4.[8]

In many small countries, liberalisation efforts in terms of a more open current account, FDI and portfolio flows has led to increased correlations, which has served to diminish the benefits from diversification. In order to explore this issue, Table 4 also breaks the overall period into two halves. The correlation of the overall index (Cospi) against the S&P 500 doubled from 0.1 in the first half to 0.21 in the second half. However, 0.21 remains a small number by world standards. For example, it is lower than the correlation of Korea's Kospi against the S&P 500 in the first half. It is also significantly lower

[8]October 1995 is used as the starting point for this dataset, since it reflects the point by which the early sharp increase in foreign portfolio flows had been completed, and some major changes in the domestic equity market design had been completed. Hence, the period from 10/1995 onwards represents a comparable period.

This uses weekly returns data from 10/1995 to 2/2004. Nifty is the Indian stock market index of the top 50 stocks. Nifty Jr. is the second rung of 50 stocks. Cospi is the encompassing Indian index of all active stocks, which number around 2000. Kospi is the Korean stock market index.

Full period

	Nifty Jr.	Kospi	Nifty	S&P 500
Cospi	0.862	0.254	0.911	0.159
Nifty Jr.		0.233	0.776	0.099
Kospi			0.280	0.312
Nifty				0.221

First half (10/1995 – 12/1999)

	Nifty Jr.	Kospi	Nifty	S&P 500
Cospi	0.868	0.105	0.935	0.101
Nifty Jr.		0.101	0.803	0.023
Kospi			0.155	0.237
Nifty				0.169

Second half (12/1999 – 2/2004)

	Nifty Jr.	Kospi	Nifty	S&P 500
Cospi	0.863	0.424	0.892	0.209
Nifty Jr.		0.377	0.760	0.142
Kospi			0.441	0.396
Nifty				0.272

Table 4: Correlation matrix of some stock market indexes

than the Korean correlation of 0.396 in the second half.

These low correlations suggest that Indian equities could play a useful role in improving the Sharpe's ratio of globally diversified portfolios. As an illustrative example, applying a portfolio optimiser to the historical covariance matrix over this period yields weights of 61.6% for the S&P 500, 11.5% for the Korean KOSPI and the remainder in India (19.1% in Nifty and 7.8% in Cospi).

In the case of many emerging markets or transition economies which embarked on removing capital controls, portfolio flows were constrained by the limited number and size of domestic firms that existed. In contrast, India had a strong set of domestic firms in place by the 1990s. A steady flow of startups and IPOs has fueled a large domestic corporate sector. These domestic firms offered easy investment opportunities for global investors, as compared with the transactions costs involved in FDI.

On the issues of informational asymmetries and transactions costs, India had strengths in terms of a century-old tradition of law, accounting, and stock market trading with extensive participation by domestic households. This implied that many issues about law, information disclosure and corporate governance, which were important to foreign investors, were broadly in place in India before portfolio flows commenced. India's extensive use of English has helped reduce the informational costs faced by foreign investors.

While the extensive participation by domestic households offered the possi-

bility of a liquid and active stock market, in the early 1990s, there were many weaknesses in the market design, which led to high transactions costs. As a response to these weaknesses, many domestic firms chose to disintermediate the domestic securities markets, and engage in offshore issuance through American Depository Receipts (ADR) or Global Depository Receipts (GDR) markets. This allowed these firms to exploit the superior market design which was available outside in London or New York. However, securities issued outside the country did suffer from poor liquidity owing to the lack of widespread trading interest and incompatible time zone.

Partly as a response to the difficulties faced by foreign investors on domestic stock markets, India embarked on a major program of modifying incentives and institutions on the securities markets (Shah & Thomas 2000, 2003*a*). This involved a new securities regulator (SEBI), and a new set of securities trading institutions (NSE, NSCC and NSDL).[9]

This reforms program had a profound impact upon transactions costs (Shah & Thomas 1997). It helped foster IPOs and the growth of market capitalisation, and foreign investment. It also eliminated the rationale for offshore issuance as a mechanism to disintermediate an inefficient domestic market.

In the process of institution building on the securities markets, India harnessed the scale economies associated with a large number of listed companies and a large number of active speculators. The two stock markets in India - NSE and BSE - are ranked 3rd and 5th in the world by the number of transactions. These economies of scale in India were a sharp contrast with the difficulties faced by many small countries in building liquid securities markets (Shah & Thomas 2003*b*).

The bond market experienced a very different trajectory in the domestic reforms process, and largely failed to achieve comparable results in terms of liquidity and transparency. However, the prevailing policy environment aimed to discourage debt related flows. Hence, the weakness of the bond market was not a binding constraint in shaping portfolio flows.

5.3 Impact of currency expectations upon portfolio flows

Given the prominence of portfolio flows into India, it is important to understand the factors that shape portfolio flows.[10] In the literature on portfolio

[9]These institutions innovated on the market design, introducing all the elements of world class securities infrastructure: demutualisation of the exchange (1993), electronic limit order book market (1994), elimination of entry barriers into intermediation (1994), nationwide access (1994), novation at the clearing corporation (1996), dematerialised settlement (1996), equity derivatives trading (2000-2001) and T+3 and then T+2 rolling settlement (2001, 2002).

[10]This question has been recently addressed by Gordon & Gupta (2003).

	Parsimonious	"Kitchen sink"		
Intercept	238.245	207.209		
CIP error	**106.937**	**74.679**		
	(5.26)	**(2.09)**		
Squared CIP error	**8.985**	4.121		
	(2.10)	(0.76)		
US 90-day rate		-15.686		
		(-0.51)		
		Lag 1	Lag 2	Lag 3
Lagged Nifty returns		-0.350	6.960	8.550
		(-0.06)	(1.18)	(1.47)
Lagged industrial growth		-8.061	27.042	-4.12
		(-0.24)	(0.88)	(-0.14)
Lagged S&P 500 returns		5.052	9.196	4.961
		(0.58)	(1.05)	(0.53)
R^2	0.2668	0.3396		
Adjusted R^2	0.2477	0.2213		

Table 5: Explaining portfolio flows into the equity market

flows into emerging markets, evidence has been found about the importance of the US interest rate and flows into equity-oriented fund managers in the US. If foreign fund managers react to information in India with a lag, then lagged output and lagged stock returns should help predict portfolio inflows. If decisions of foreign fund managers are shaped by expectations about the currency, then the CIP error should help predict portfolio inflows.[11]

Portfolio flows into government bonds are highly restricted by India's capital controls. Hence, we focus on portfolio flows into the equity market. Table 5 shows two OLS regressions which explain portfolio flows into the equity market. The timespan available is short, from March 1998 till October 2004. None of the explanatory variables are significant in the "kitchen sink" model, other than the CIP error. The parsimonious model is a quadratic in the CIP error, where bigger flows come into the equity market when the currency is expected to appreciate, with a nonlinearity in response where bigger errors induce bigger inflows.

These results suggest that in India's short experience, traditional explanatory variables appear to be relatively less important, and that currency expectations do play a role in shaping portfolio flows into the equity market.

[11] As of late 2004, the Indian r_f was 4.5%, the historical equity premium was roughly 8% and the annualised volatility of the equity index was roughly 20%. The Sharpe's ratio of the equity index – as viewed by a foreign investor – would hence be significantly affected by currency views of (say) ±5%.

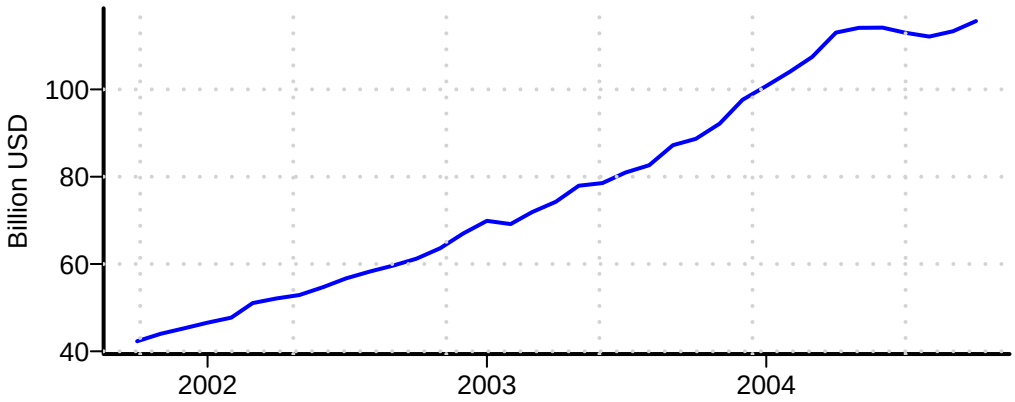

Figure 5: Foreign currency reserves

6 Outward flows owing to reserves accumulation

As argued in Section 2, a major feature of India's recent experience with capital flows has been the outward flows of capital taking place owing to purchase of reserves. The recent experience with the stock of reserves and the flow of net purchases by the RBI on the currency market is shown in Figure 5 and Figure 6.

This shows a striking buildup of reserves, from roughly $40 billion to $115 billion, over the period from late 2001 to early 2004. Through this period, RBI purchases on the currency market went up to $7 billion in April 2004. Patnaik (2003) argues that this reserves buildup was related to implementing the currency regime. Trading by RBI on the currency market, and the change in reserves, understates the extent of outward capital flows, since many other decisions were also taken in order to help sustain the currency regime which were associated with outward capital flows and reduced inward flows. These included prepayment of loans of the government, through which the net capital flows on account of "Official flows" in 2003-4 seen in Table 1 show an outward flow of $3.12 billion.

Through this period, India experienced current account surpluses. This was a paradoxical turnaround compared with the starting point of the reforms. A goal of the early reforms was to find a sustainable mechanism to sustain the import of capital, i.e. a current account deficit. By 2002, India found itself in a situation with persistent export of capital, which raised concerns about the adverse impact on GDP growth (Lal et al. 2003).

An equally interesting feature of India's experience was the period from May

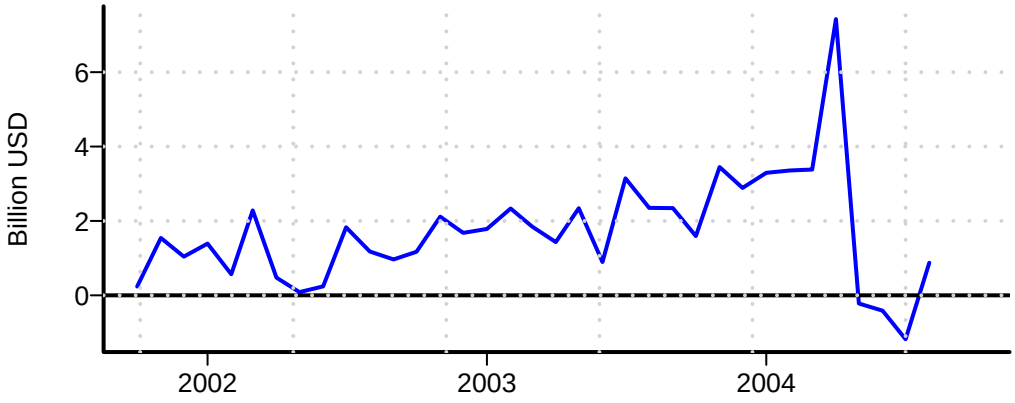

Figure 6: RBI purchases on the currency market

2004 onwards, where currency trading by the RBI dropped to very low levels, and the reserves accumulation largely halted.[12] There appears to have been a change in the currency regime in April 2004, leading to a sharp drop in outward capital flows through purchase of reserves.

The daily volatility of INR/USD returns, which was at 0.155% per day in the period of sharp reserves accumulation (1/1/2000 to 30/4/2004), rose to 0.312% per day in the period after April 2004. Similarly, the R^2 of the Frankel-Wei regression dropped significantly from 0.9471 in the (full) post-2000 period to 0.8087 in the period from May 2004 onwards. This suggests a diminished extent of pegging. This change in the currency regime was associated with a substantially smaller outward flow of capital on account of foreign exchange reserves.

7 Implications of the present framework

7.1 Impossible trinity

As highlighted in Table 1 early in this paper, the size of the current account and the capital account rose sharply from 1992-93 to 2003-04. Gross flows

[12]Reserves continued to fluctuate owing to the currency composition of the portfolio, and returns are earned on the fixed income instruments in which reserves are invested. In addition, the period after May 2004 was one where the USD depreciated significantly against the Euro. Since India held significant Euro denominated assets, but reported foreign currency reserves in USD, this showed up as higher reserves. However, the data disclosed about trading on the currency market by the RBI clearly show that the actions by RBI on this front had undergone a sea change.

on the current account, expressed in USD, grew at a compound rate of 12.77 per cent per annum, and gross flows on the capital account grew at a similar rate of 11.97 per cent per annum. Both these growth rates were faster than the growth of GDP expressed in nominal USD of 9.36 per cent per annum. Hence, the overall measure of integration rose sharply from 40.4 per cent of GDP in 1992-93 to 55 per cent in 2003-04.

Under these conditions, considerable movements of capital can take place in response to speculative views about the currency. As an example, the regression results of Table 5, CIP violations are an important explanatory variable in the model for portfolio flows.

The year 2003-04 serves as a valuable illustration of how capital flows would behave under conditions where the currency regime left significant opportunities for speculative trading on the currency. Going beyond the current account, FDI and portfolio flows, even under the constraints in place in India, debt flows can also play a role in currency speculation. It is striking to notice that in 2003-04, debt flows worked out to roughly $6 billion out of total net capital flows of $20 billion.

Finally, it is well known in the literature on capital controls that the current account can be used for implementing capital movements and currency speculation, through overinvoicing, underinvoicing, prepayment, and delayed payments (Patnaik & Vasudevan 2000). These issues have become more pertinent, given the sharp rise in the size of the current account, from 25% of GDP in 1992-93 to 35% in 2003-04.

These arguments suggest that the impossible trinity is an increasingly important constraint faced by Indian macro policy (Joshi 2003). Patnaik (2005, forthcoming) examines how monetary policy was attenuated through implementation of the currency regime in two prominent episodes in the recent 11-year period.

7.2 Volatility of capital flows

As argued above, India's stance on liberalisation of the capital account was strongly motivated by certain priors about the volatility of capital flows, and about the extent to which different kinds of capital flows would impinge upon implementation of the prevailing currency regime. In the literature, there has been disagreement about the volatility of the various kinds of capital flows, and the interplay between the currency regime adopted and the volatility of certain kinds of capital flows.[13]

[13]In Asia, in the decade of the 1990s, (Alfaro et al. 2004) find that in Asia, the volatility of capital flows has been 1.2 for FDI, 15.4 for portfolio equity flows, and 1.6 for debt. They define "volatility of capital flows" as the standard deviation of per capita net capital

	Minimum	25th percentile	Median	75th percentile	Maximum	Inter-quartile range
Raw data						
Portfolio	−423	260	594	899	4111	624
FDI	365	595	886	1175	1768	564
Debt	−1257	270	826	2330	3895	1825
Official	−2657	−738	−24	210	857	921
Total	−1514	1436	2426	3969	5315	2496
Residuals about time trend						
Portfolio	−1278	−531	−19	311	2903	815
FDI	−534	−137	−26	115	666	246
Debt	−2448	−826	−230	1083	2833	1806
Official	−2249	−555	261	511	1214	1017
Total	−3648	−771	224	1317	2340	2018

Table 6: Volatility of capital flows : summary statistics of quarterly data in million USD, from Q1/1995 to Q2/2004

We can use quarterly BOP data in order to review India's experience with volatility of the four components of capital flows. In order to avoid the formative period, we focus on the period after 1995. This helps us obtain information about the behaviour in the post-reform period.

Table 6 shows summary statistics about the four components of net capital flows, using data for 37 quarters from the Q1/1995 to Q2/2004. Since the data often has unusual distributional characteristics, the interquartile range is used as a relatively nonparametric measure of dispersion.[14]

The raw data show that a net outflow was never observed in the case of FDI. FDI and Portfolio flows have similar values for the inter-quartile range. Debt and official flows seem to be much more volatile than FDI and portfolio flows.

When expressed as residuals about a time trend, all four components have experienced significant negative outflows in the worst quarter. Viewed in this fashion, FDI flows seem to be highly stable, and more stable than other components. The ranking of volatility of components, when viewed in this fashion, appears to be Debt > Official > Portfolio > FDI.

Over this period, fluctuations in debt and official flows frequently reflected changes in the policy framework. Capital controls and other policy levers were regularly used to encourage or discourage debt and official flows, de-

flow divided by the average of gross inflow and gross outflow.

[14]The prob values obtained using the Shapiro-Wilk test of normality for the five time-series are : Portfolio (4.672×10^{-6}), FDI (0.081), Debt (0.035), Official (0.0018) and Total (0.57). Hence, we avoid the use of the standard deviations as a measure of dispersion.

pending on the tactical exigencies of implementing the currency peg. Hence, there is a need for caution in interpreting the characteristics seen therein, which may reflect factors such as policy volatility and currency expectations. The volatility of debt flows and of official flows might have been very different if India's policies on capital controls had been stable, or if the currency regime had been different.

The results for the volatility of India's portfolio and FDI flows appear to be more meaningful, since they reflect the outcomes obtained under a broadly stable policy framework, subject to a steady process of liberalisation whereby controls have been slowly relaxed over the years, with an essentially one-way direction of reforms.

8 Conclusion

India serves as an interesting case study in integration into the world economy. The initial conditions involved a small trade/GDP ratio, and a highly repressed capital account. At the same time, India had many potential strengths for participating in the global financial markets. These included strong traditions of law and accounting, a long tradition of equity ownership and trading, and an absence of a history of default.[15]

The goals of the reforms of the early 1990s were articulated by the policy makers of the time as comprising three elements:

1. Avoiding debt flows and particularly short term debt flows, which were viewed as being potentially destabilising.
2. Increasing India's trade integration into the world.
3. Spurring Indian growth by harnessing the growing global FDI and portfolio flows.

India did not engage in 'big bang' liberalisation. The full policy implications of this broad position were worked out through a steady pace of numerous reforms initiatives in the 1992-2004 period. The present framework of tariffs, restrictions against FDI and restrictions against portfolio flows implies that the reforms agenda on the current account, on FDI and on portfolio flows remains incomplete as of 2004.

Looking back, these goals have been achieved to a significant extent:

1. Net debt flows were at roughly 1% of GDP in both 1992-93 and 2003-04. Gross debt flows actually dropped sharply, from 13.5% of GDP in 1992-93 to 10.6% in 2003-04.
2. Trade integration has gone up sharply, with gross current account flows rising from 25% of GDP in 1992-93 to 35% in 2003-04.
3. FDI and portfolio flows have gone up sharply. India has fared particularly well in the institutional transformation of the equity market, which helped Indian equities obtain acceptance in global portfolios. The experience with FDI flows, while showing strong growth rates when compared with the initial conditions, lags that of other Asian countries, both in absolute terms and when expressed as per cent to GDP.

[15] As emphasised in Reinhart & Rogoff (2004), some countries are "serial defaulters" and pose high risks to foreign sources of capital. India has been through two IMF programs in situations where a fixed exchange rate regime was challenged owing to near-exhaution of reserves (in 1981 and 1991). However, India has never defaulted.

In an open-economy, these three aspects of policy are closely intertwined with the currency regime. India has been in a quest for openness in trade, FDI and portfolio flows, while continuing to have capital controls in most other respects, and trying to have both an independent monetary policy and a pegged exchange rate. There was a very strong consensus about the usefulness of extensive trading by the central bank on the currency market in implementing currency policy. Indeed, issues about the currency regime were not debated in the 1992-2002 period.

As a consequence, India's experience with capital flows is deeply intertwined with India's experience with the currency regime. Capital flows have shaped the currency regime, and the currency regime has shaped capital flows.

Openness on the trade account, FDI and portfolio flows has given economic agents opportunities to express speculative views about currency movements, and thus thrown up new problems in the implementation of pegging. India differs from China in the importance of portfolio flows. Portfolio flows involve robust inflows *and* outflows. For example, in 2003-04, portfolio inflows were only 1.67 times bigger than portfolio outflows, and gross portfolio flows amounted to 7 per cent of GDP.

Difficulties faced by the central bank in implementing the currency regime have continually influenced the pace of removal of controls on capital flows. In particular, there has been significant policy volatility with respect to debt flows, ranging from periods with government-sponsored offshore borrowing to periods with sharp restrictions upon offshore borrowing. Similarly, policies on outward capital flows have been ambivalent, and have lacked the consistent direction of reform that was found on the current account, on FDI and on portfolio flows.

The implementation of the currency regime has led to large capital outflows in the form of reserves accumulation by the RBI. This was particularly the case in 2003-04, when 4.9% of GDP left the country in this fashion. The total outward flow was larger than this when we take into account other policy tools such as pre-payment of official debt, which were used in 2003-04.

One of the key goals of the reforms of the 1990s was *to augment domestic GDP growth by attracting FDI and portfolio flows.* In 2003-04, the total net capital inflows of $20.5 billion were accompanied by an outward official capital flow of over $31.4 billion. This leads to concerns about whether this policy framework has succeded in serving the interests of accelerating GDP growth. India has undoubtedly reaped *microeconomic* benefits from the new presence of FDI and foreign investors on the equity market. However, a sustainable macroeconomic framework for a current account deficit, and augmenting domestic investment using foreign capital, is not yet in place.

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