Did the Indian capital controls work as a tool of macroeconomic policy?

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Abstract

In 2010 and 2011, there has been a fresh wave of interest in capital controls. India is one of the few large countries with a complex system of capital controls, and hence offers an opportunity to assess the extent to which these help achieve goals of macroeconomic and financial policy. We find that the capital controls were associated with poor governance, were unable to sustain the erstwhile exchange rate regime, and did not support financial stability. India's experience is thus inconsistent with the revisionist view of capital controls. Macroeconomic policy in India has moved away from the erstwhile strategies, towards greater exchange rate flexibility combined with capital account liberalisation.

JEL Codes: F32, F33
Keywords: Capital controls, exchange rate regime, monetary policy, impossible trinity; financial stability.

Contents

1 Introduction

The debate on the effectiveness of capital controls has come alive after an IMF staff proposal supporting the use of controls by emerging economies facing large volatile inflows (Ostry, Ghosh, Habermeier, Chamon, Qureshi, and Reinhardt, 2010). The impact of controls on the magnitude and composition of capital flows, on frictions in transacting and monetary policy have been a subject of enormous debate.[1] There is however little consensus on the issue. The empirical experience about the effectiveness of capital controls varies with initial conditions Magud, Reinhart, and Rogoff (2011). To the extent that there are country specific characteristics that make capital controls effective, understanding individual country experiences with capital controls gains significance.

There has been considerable interest in India's experience, for two reasons. One is that India has long had an extensive system of administrative controls. While capital controls may have limited effectiveness in a country that has removed controls completely and then attempts to reintroduce them in a limited way, India has a long standing legal and administrative structure in place that can support imposition or tightening of a comprehensive array of controls. The well-known Chinn-Ito measure of *de jure* restrictions attaches a score for each country for each year from 1970 onwards, ranging from -1.83 (for completely closed) to +2.5 (for completely open). In this dataset, India stood at -1.13 in 2008, implying that it is much less open than most other major emerging markets like Brazil, South Korea and Russia, and about as closed as China. Also, in contrast to market based controls which are often seen to be effective in the short run (Edwards, 2007), the experience of countries such as India and China who have administrative controls has not been studied in the literature (Davies and Drexler, 2010).

The second reason is that India fared relatively well in the global crisis. As the global economy slowed, so did the Indian economy, with seasonally adjusted GDP growth dropping from a peak of annualised growth of 11.7 per cent (quarter ended Dec 2005) to 4.0 per cent (quarter ended December 2008), a decline of 7.7 percentage points. While this was a very large drop by any standard, growth remained positive in the downturn, and no large

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[1]*See:* DeKaplan and Rodrik (2002); Clements and Kamil (2009); Vieira and Holland (2003); Edwards (2007); Vithessonthi and Tongurai (2010); Reinhart (2000); Espinoza (2005); Reinhart and Smith (1998); Binici, Hutchison, and Schindler (2010); Reinhart and Edison (2001); Tamirisa (2007); Kawai and Takagi (2004); Reinhart and Smith (2002); Campion and Neumann (2004); Eichengreen (2001); Eichengreen and Leblang (2003); Desai, Foley, and Hines (2006); Forbes (2007); Edison and Warnock (2008)

financial firm went bankrupt.

The juxtaposition of extensive controls and a favorable economic performance has suggested to some that the two were causally linked. It has been argued, for example, that controls made India more resilient, by isolating it from shocks that occurred elsewhere, and preventing a build-up of foreign debt. This paper attempts to subject this claim to careful analysis. Similar to the analytical framework proposed by Magud, Reinhart, and Rogoff (2011) it attempts to answer a critical question: *Did the system of controls actually work as a tool for macroeconomic policy?*

While the structure of controls remained in place, there was a continous, albeit slow movement towards reducing controls and opening up of the capital account for a decade starting in 1991. In the period after the Asian crisis, especially in the years 2001-2004, the Indian economy started attracting larger capital inflows. The policy of maintaining a low volatility of the exchange rate of the rupee was implemented through central bank intervention in the foreign exchange market. The Reserve Bank of India sterilised its intervention.

As has been observed in the international experience, sterilised intervention tends to *increase* capital inflows, especially short-term capital (Montiel and Reinhart, 1999). India too saw a sharp growth in capital inflows as expectations of rupee appreciation added to the higher interest rate differential and enhanced the attractiveness of the rupee as an asset (Patnaik, 2005). After 2004, when RBI ran out of its stock of government bonds which it had been using for sterilisation, the costs of sterilisation became more transparent. The RBI then shifted to only partial sterilisation. With this, expectations of appreciation increased, and India witnessed a surge of capital flows. After this, there was a surge of effort at RBI on using capital controls to regain autonomy of monetary poliy.

As the detailed narrative of the paper suggests, these efforts introduced substantial microeconomic costs and involved important deficiencies of governance. Even if these costs are disregarded, the performance of the capital controls system can be broken down into three components:

Magnitude and composition of inflows The capital controls reduced particular types of inflows (such as long-term foreign currency borrowing), but could not ensure that the overall magnitude of capital inflows was small. Indeed, by 2007 overall flows had reached 9 percent of GDP – large not only by historical Indian standards, but also by comparison with other major emerging markets, most of which had more liberal *de*

jure regimes.

Monetary policy regime Despite a series of reinforcing measures, the controls were not tight enough to preserve the monetary policy regime. The *de facto* exchange rate peg gave way, in two steps, to a more flexible exchange rate regime. On 23 May 2003, there was a structural break in the exchange rate regime, and for the next four years, rupee-dollar volatility doubled to 3.9 per cent annualised. This arrangement worked till 23 March 2007, when there was another structural break and for the next four years, flexibility doubled once again to 9.0 per cent annualised. For the most recent 20 months, the rupee has witnessed negligible intervention: it has been a clean float.

Financial stability The attempt to uphold the exchange rate regime with capital controls actually eroded financial stability.

Since the controls proved porous and sterilisation was only partial, the large scale purchase of dollars spilled over into loose monetary policy. The largest ever credit boom in India's history came about, with credit to the private sector growing by around 30 percent year-on-year for three consecutive years.

India also experienced an asset price boom on the stock market which was more extreme than that seen with most emerging markets, some of which had open capital accounts.

The capital controls regime was not successful in preventing firms from taking on currency exposure. Indeed, to the extent that the capital controls helped sustain a relatively inflexible exchange rate regime, the evidence suggests that it encouraged firms to increase their currency exposure. In contrast, during periods of exchange rate flexibility, firms reduced their balance sheet exposure to foreign currencies.

Nor were the capital controls successful in insulating the Indian financial system from foreign disturbances. To the contrary, the domestic money market was badly disrupted when Lehman Brothers failed, with money market rates tripling to more than 15 percent, and mutual funds suffering from large withdrawals, forcing the central bank to inject large amounts of liquidity to banks and other financial institutions.

In sum, the evidence suggests that India's capital control system did not deliver on the goals of policy makers. Even an unusually extensive set of controls proved unable to sustain India's macroeconomic and financial framework at a time when the economy was integrating rapidly with the rest of the world.

Indeed, the macroeconomic policy framework in India has evolved in two directions in recent years. First, as described above, in March 2007 the exchange rate regime moved towards greater flexibility, and after April 2009, currency trading by the central bank has subsided.

Second, policymakers have moved towards liberalisation of capital controls. A recent Ministry of Finance Working Group report has recommended a series of reforms. Of particular importance are issues of rule of law, where certain deficiencies were visible in the pre-crisis period, and flawed policy positions on issues of financial stability, such as the bias in the capital controls regime in favour of OTC derivatives (as opposed to exchange-traded derivatives) and in favour of dollar denominated borrowing (as opposed to local currency borrowing). In February 2011, the implementation of some of these proposals commenced.

An overall judgment about capital controls on the global scale cannot, of course, turn on the experience of one country. However, India stands out in this debate. Given the complex administrative system of capital controls that was in place, it was an ideal setting where capital controls could have worked. Yet, even in India, capital controls failed to deliver the goals of policy makers.

India is perhaps representative of large middle income countries with a relatively sophisticated private sector and financial system. The lessons of this experience may well be inapplicable in the least developed countries.

The remainder of this paper is organised as follows. Section 2 offers a brief description of the Indian capital controls regime. Section 3 explains how this system was tightened to restrict inflows. Section 4 examines the empirical evidence on the extent to which the Indian capital controls regime achieved the goals of macroeconomic and financial policy. Section 5 looks forward, outlining the thinking of the Indian authorities on reforms of the capital controls regime. Finally, Section 6 concludes and identifies areas for further work.

2 An elaborate administrative system of capital controls

2.1 International comparison

During colonial rule, India had full convertibility. Capital controls were first introduced by the British in 1942, and the complex administrative arrangements steadily grew through the years. Since the 1980s, the country has gradually opened up to the outside world, but a wholesale abolition of capital controls, or a shift to full capital account liberalisation, has not been undertaken. Instead, highly limited mechanisms for cross-border finance have been brought into place, with strong government involvement in terms of permissions, quotas, and prescriptive rules.

India's policy makers believed that large capital inflows would adversely affect financial stability by triggering asset price booms, imprudent lending, currency mismatches, etc. It was also felt that when large capital flows interacted with the pegged exchange rate regime, this would yield substantial monetary policy distortions. It was hoped that capital controls would modify the magnitude and composition of capital flows, and thus assist in the preservation of the exchange rate peg, and help to improve financial stability.

Over recent decades, many countries have moved towards greater *de jure* capital account openness. One measure of *de jure* capital account restrictions is the Chinn-Ito measure (Chinn and Ito, 2008).[2]

Figure 1 superposes the kernel density plot, across countries, of the Chinn-Ito measure in 1970 as opposed to 2008. In 1970, most countries were fairly closed. In 2008, there was a bimodal distribution, with many countries being fairly open.

Table 1 compares India against the 'BSST' countries (Brazil, South Africa, South Korea and Turkey).[3] In 2008, South Africa, Turkey and China had the

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[2]Chinn and Ito (2008) codify the tabulation of restrictions on cross-border financial transactions as in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER). The four major categories used are: presence of multiple exchange rates, restrictions on current account transactions, capital account transactions and requirement of surrendering export proceeds. The index for capital account openness is the first standardised principal component of these four categories and the share of five year window to account for controls on capital transitions.

[3]These four countries are members of the G-20 with a political and legal system that are similar to India, and unlike those found in China or Russia. A detailed treatment of

Figure 1 The density of the Chinn-Ito score
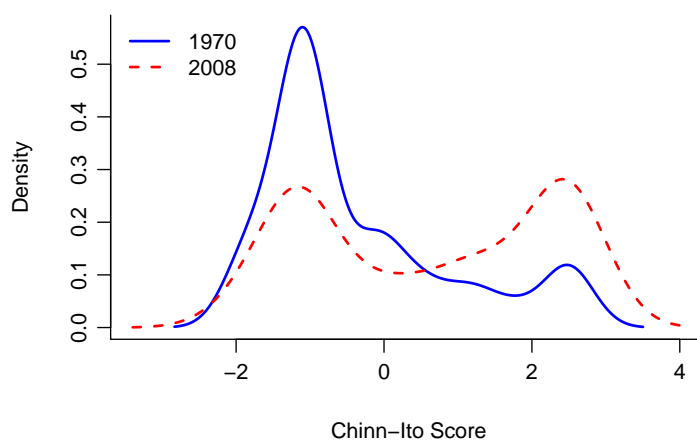
Table 1 *De jure* capital account openness: Chinn-Ito measure

Country	Openness Score (2008)
India	-1.13
Brazil	0.99
South Africa	-1.13
South Korea	0.18
Turkey	-1.13
BSST average	-0.27
China	-1.13
Russia	-0.09

Source: Chinn and Ito (2008)

Figure 2 Organisation of capital controls
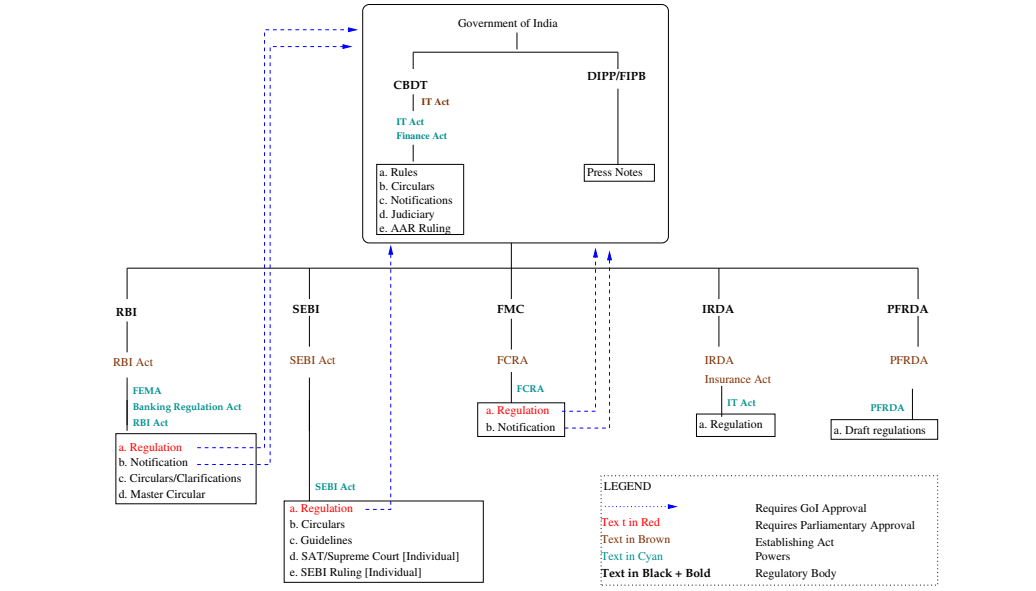
same score as India, while Brazil, South Korea and Russia had liberalised to a greater extent. In 2007, roughly two-thirds of the countries in the Chinn-Ito database were more open than India.

2.2 The regulatory framework

The overall system of capital controls involves the activities of the following agencies: the Ministry of Finance (for portfolio investment), the Ministry of Industry (for foreign direct investment), the Reserve Bank of India, the Securities and Exchange Board of India, the Forward Markets Commission, the Insurance Regulatory and Development Authority, and the Pension Fund Regulatory and Development Authority. The agencies and laws are shown in Figure 2.

This reflects the fact that many laws embed capital controls. The Foreign Exchange Management Act, 1999, plays a major role in capital controls. But at the same time, numerous laws have provisions which impose rules upon the inbound or outbound flows of capital. As an example, laws pertaining to insurance prohibit insurance companies from holding overseas assets.

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the rationale of this choice of peers, as opposed to the widely used 'BRIC' set of countries, is presented in Sinha (2010).

Figure 3 Investor classes
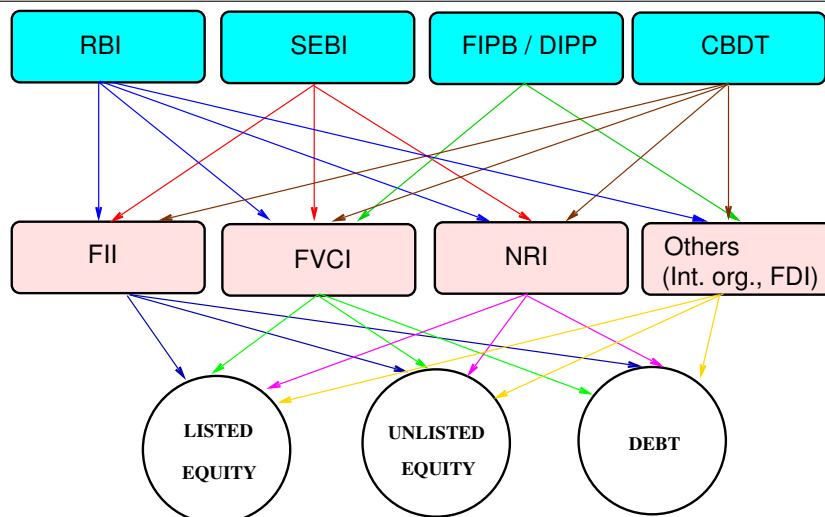
Given these large numbers of laws and agencies, there is no unified capital controls manual. The Reserve Bank of India articulates policy with regard to capital account transactions through regulations. These are subject to Parliamentary scrutiny. Beyond this, the Reserve Bank of India and Ministry of Finance issue notifications which are published in the official gazette. In addition, the Reserve Bank of India issues circulars, master circulars and clarifications. If a unified capital controls manual were prepared, it would run into many thousands of pages. While over $148 billion of foreign capital has been invested in listed equities alone, so far neither public nor private sources have created a unified capital controls manual. A recent report produced by the Ministry of Finance (Sinha, 2010) gives a useful strategic picture of the overall system of capital controls.

The capital controls feature rules that pertain to each asset class and each investor class. Different rules exist for listed equity, unlisted equity, debt, derivatives, and foreign direct investment. Individual investors, foreign corporations and non-resident Indians are treated differently under the law from broad based funds, charitable trusts or university endowment funds. Figure 3 shows how multiple government agencies (Reserve Bank of India, Securities and Exchange Board of India, Foreign Investment Promotion Board, Department of Industrial Policy and Promotion, Central Board of Direct Taxes) impinge upon various foreign investor classes defined in Indian capital controls law (Foreign Institutional Investor, Foreign Venture Capital Investment, Non Resident Indian, others) and their activities on various asset classes (listed equity, unlisted equity, debt).

The system of capital controls has imposed significant transactions costs upon both inbound and outbound capital flows. With this large body of law created by multiple agencies, the rules are overlapping and sometimes contradictory. Different rules for different categories of players create problems of regulatory arbitrage and lack of transparency.

There are concerns about the quality of governance in the administration of this system of capital controls, with civil servants wielding discretionary power in a non-transparent setting. Sinha (2010) noted that in the handling of permissions under Foreign Exchange Management Act by the Reserve Bank of India, an effective appeals mechanism is lacking. There is no time limit within which a permission may be granted or denied, and no related obligation to provide reasons for the denial of a permission. Decisions regarding permissions are not published by Reserve Bank of India. Applicants are provided no clear indication of when permissions would be given.

As an example of the complexity involved, we show some details about the region where the capital controls regime is the *most* liberal: listed equities.

- Inflows into listed equity can only come through specified channels. Foreign corporations, funds or individuals who meet the criteria for registering as a 'Foreign Institutional Investor' (FII), or creating an 'FII sub-account', are required to register with Securities and Exchange Board of India. Then, they are allowed to invest in the securities of an Indian company under the Portfolio Investment Scheme, subject to ceilings of up to 10 percent of the shares of the company for each Foreign Institutional Investor or sub-account. But:

  > *This cap does not apply if the investor belongs to a different background. If the subaccount belongs to an individual or foreign corporation (as opposed to a broad based fund, charitable trust or university fund, endowment, foundation or proprietary fund of a registered Foreign Institutional Investor), then the limit is 5 percent.*

  Sinha (2010)

- However, 'foreign venture capital funds' are allowed to invest up to one-third of their funds in specified forms of listed equity:

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> *Again there is an exception: foreign venture capital funds may invest in IPOs of venture capital undertaking where the shares are proposed to be listed, debt or debt instruments of venture capital undertakings where the foreign VC has already made an investment by way of equity and preferential allotment of equity shares of a listed company subject to a lock-in period of one year.*

<div align="right">Sinha (2010)</div>

- 'Non-resident Indians' are allowed to invest in listed equity. Foreign Exchange Management Act regulations allow individual investment of up to 5 percent of the total paid value of shares issued by an Indian company subject to an aggregate 10 percent cap for all Non Resident Indians investing in that organisation:

  > *Purchases of equity in certain narrowly defined categories are prohibited for Non Resident Indians. Non Resident Indians are prohibited from purchasing shares of chit funds, nidhi companies or companies involved in agricultural, plantation, real estate or farm house construction as well as those dealing in Transfer of Development Rights.*

  > *There appear to be other inconsistencies in the law: Foreign Exchange Management Act Regulation 5(4) and Schedule 5, Paragraph 2(1A)(i) and 2(2). Paragraph 2(1A)(i) allows unlimited Non Resident Indian purchase of the shares of domestic mutual funds on a repatriation basis. Paragraph 2(2) allows the same on a non-repatriation basis.*

<div align="right">Sinha (2010)</div>

These complexities – in the most open area (listed equities) – demonstrate that India has a large and complex administrative system of capital controls with specific rules governing a diverse array of cross-border finance.

We now turn to a chronological narrative of the experience with the use of capital controls in the setting of macroeconomic policy.

3 A System Under Strain, 1998-2008

3.1 Phase 1: Pegged exchange rate with sterilised intervention

After a brief period of managed floating during the initial year of the Asian crisis, a *de facto* peg to the USD dollar (i.e., extremely limited flexibility) was reestablished on 28 September 1998, under which for the next four years, until mid 2003, the volatility of the bilateral rupee-dollar rate was reduced to 1.92 per cent per year.[4]

As the Asian crisis subsided and the Indian economy emerged out of its downturn strong capital inflows resurged. In this period, the pegged exchange rate was upheld using sterilised intervention. When foreign assets were purchased, the rise in reserve money was neutralised by the sale of domestic assets.

This arrangement worked for a period of four-and-a-half years. Expectations of slow rupee appreciation made the rupee an even more attractive asset than it already was given the large interest differentials. In this period India faced larger capital inflows as characteristic of countries that implement sterilised intervention (Montiel and Reinhart, 1999). This then required an increased pace of intervention. The substitution of domestic assets by foreign assets in reserve money resulted in a rise in the share of foreign assets in reserve money.

Figure 4 shows the time-series of the share of foreign exchange reserves in reserve money through this period. Gradually, the central bank exhausted its stock of domestic assets. By early 2003, the entire reserve money was made up of foreign assets. On 16 May 2003, this phase of exchange rate inflexibility was abandoned and the bilateral volatility of the rupee-dollar rate was permitted to increase. It rose to 3.9 per cent per annum in the period mid-2003 to March 2007. The pressure in the foreign exchange market continued to be high as the combination of high interest differntials and expectations of rupee appreciation made the rupee a one way bet (Patnaik,

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[4]Our strategy for measurement of the exchange rate regime draws on the methodology of Zeileis, Shah, and Patnaik (2010), where structural change econometrics is used to identify break dates in the exchange rate regression (Frankel and Wei, 1994). The dates of structural change in the exchange rate regime identified through this methodology are as follows: A first period with high inflexibility from 28 Sep 1998 till 16 May 2003, followed by greater flexibility till 16 Mar 2007, followed by greater flexibility. In the main argument of this paper, this dating is combined with the measured bilateral rupee-dollar volatility as a measure of exchange rate flexibility.

Figure 4 Share of foreign exchange reserves in reserve money in Phase I
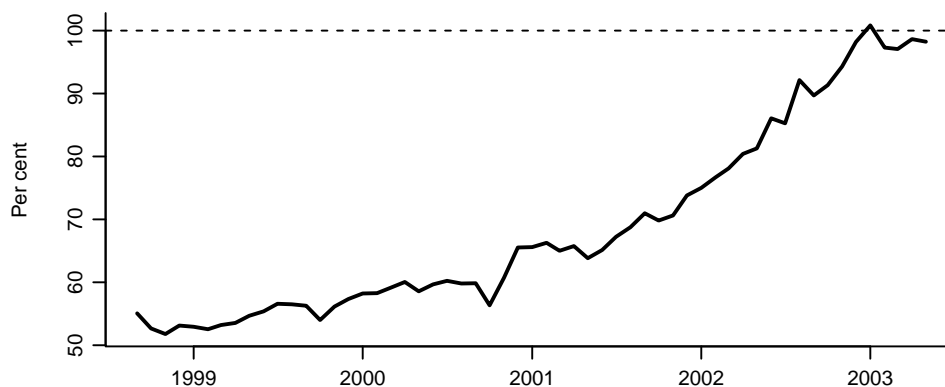
2005).

3.2   Phase 2: Emphasis on capital controls

Once the stock of bonds with the central bank was exhausted, a new mechanism for sterilisation was found. Direct issuance of sterilisation bonds by the central bank was not feasible owing to provisions in the Reserve Bank of India Act which forbade bond issuance by the central bank. Hence, headroom for sterilisation was obtained through a 'Market Stabilisation Scheme' (MSS). Here, the central bank sold bonds as an agent of the Ministry of Finance, where the proceeds from the sale of bonds were sequestered in a separate account, and the interest cost of these bonds was shown explicitly as an on-budget cost.

While MSS was, and is, a feasible strategy for sterilisation, this arrangement also brought a fresh transparency upon the fiscal costs of implementing the exchange rate regime. The exchequer, and ultimately Parliament, weighs the visible costs of interest payment for MSS bonds against the benefits of exchange rate pegging. This brought a new level of scrutiny upon the actions of the central bank, transparency which made it more difficult to undertake sterilisation, especially after the stock (and cost of servicing) the MSS bonds began to grow rapidly, in a nation with an already heavy fiscal debt. Perhaps as a consequence of this, in the following period, the issuance of sterilisation bonds was constrained and sterilisation was only partial.

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The continued presence of large capital inflows posed fresh stress upon the exchange rate regime. In order to uphold the monetary framework, the central bank attempted a combination of tightening the large number of levers available in the capital controls regime. This was an interesting period where we obtain evidence about the extent to which monetary policy autonomy was regained through capital controls while maintaining exchange rate policy.

3.3   Examples of capital account restrictions

The Indian capital controls regime offered a very large number of avenues through which thousands of pages of rules could be used to hinder capital inflows. Some examples of the specific mechanisms which were adopted are as follows:

Hindering foreign borrowing Dollar-denominated borrowing with a maturity below three years has been prohibited under Indian capital controls. In 2004, a capital control was introduced upon this borrowing, where the interest rate paid by the borrower was capped. For loans of a maturity between three to five years, this ceiling was set to 200 basis points, and for loans of a maturity of above 5 years, this ceiling was set to 350 basis points.

This capital control would shift the composition of borrowing away from weaker companies (who are typically smaller) and favour companies with lower credit risk (who are typically larger). The impact of this control upon the overall *magnitude* of dollar denominated borrowing is less clear.

While there is no explicit cap on the total foreign borrowing that includes both External Commercial Borrowings (ECBs), i.e dollar borrowings by companies and FII investment in rupee denominated bonds, the policy framework attempts to control this magnitude. However, there is a ceiling on FII investment in total rupee denominated bonds, and within that, on government bonds and corporate bonds.

By 2008, the stock of corporate borrowing under the ECB window (dollar denominated) stood at above USD 62 billion, while foreign lending to firms in rupee denominated debt was capped by the regulator at one-tenth of that value, at USD 6 billion. The bias of controls on rupee denominated versus dollar denominated debt resulted in higher dollar denominated borrowings by firms.

Table 2 Stock of dollar denominated corporate borrowing

Year	Stock of ECB (USD billion)
2000-01	23.3
2006-07	41.1
2007-08	62.3

Hindering venture capital One place where an attempt was made to stop capital was to prevent inflows by venture capital/private equity funds. As a first step, tax pass-through (to avoid double taxation) for *all* venture capital was restricted to nine sectors: poultry, dairy, nanotechnology, biofuels, hotels and hospitality, seed research, etc. This rule change impacted not just upon foreign venture capital / private equity funds, but domestic venture capital / private equity funds also.

Even if a foreign investor was willing to be double-taxed, there were problems:

> *Until recently, the Reserve Bank of India had not approved Foreign Venture Capital Investment (FVCI) registrations for quite some time and conditioned the receipt of benefits (such as those defined under investment guidelines) allowed to FVCIs to investments in 10 sectors; the 9 sectors listed in the IT Act with dairy and poultry listed as separate sectors by the Reserve Bank of India.*

> Sinha (2010)

The Reserve Bank of India restricted Foreign Venture Capital registration through their control over the ability of the foreign investors to open bank accounts. Foreign Exchange Management Act regulations authorise the creation of specific types of bank accounts for foreign residents (both Non-Resident Indians and persons resident outside India). Each Foreign Venture Capital Fund is required to open two new bank accounts. This requires Reserve Bank of India permission. Permissions granted by the Reserve Bank of India appear to have been tied to requirements such as investment in only the nine sectors mentioned for tax-pass through treatment in the Income Tax Act. This extension of tax policy was not in keeping with regulations under the Foreign Exchange Management Act.

Securities and Exchange Board of India registration The Securities and Exchange Board of India did not register investment managers as Foreign Institutional Investors even if they otherwise met rules for regis-

tration, if the investment manager was owned or substantially owned by Non Resident Indians. There is no explicit provision in Securities and Exchange Board of India regulations on this (Sinha, 2010).

Automatic route In certain situations, India had placed foreign investment and foreign borrowing by Indian companies under the External Commercial Borrowing rules on an "automatic route", whereby Reserve Bank of India would automatically approve inflows that met the stated criteria. But meetings needed to be held by the Reserve Bank of India to approve the same. Capital inflows were prevented by not holding these meetings for many months.[5]

Restrictions on offshore derivatives The term 'participatory notes' (PNs) refers to the market for OTC derivatives on Indian underlyings that trades offshore (Singh, 2007). The book runners on this market are registered FIIs in India, and they lay off the risk of their overall book using transactions on the onshore market. These overseas transactions are outside the jurisdiction of the Indian authorities. In October 2007, the Indian authorities wrote rules which restricted registered FIIs from their transactions overseas on this market, in an attempt to reduce capital inflows.

End-use restrictions In August 2007, another element of capital controls was introduced to rein in the inflow of foreign capital. Use of external commercial borrowings (ECB) for rupee related expenditure was not allowed. ECB guidelines also determine what purposes the borrowings could be used. Like other controls, these restrictions were relaxed in October 2008. In October 2008, the definition of "infrastructure sector" was expanded to include power, telecommunication, railways, road including bridges, sea port and airport, industrial parks, urban infrastructure (water supply, sanitation and sewage projects) and mining, exploration and refining, thereby expanding the scope and use of such borrowings.

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Members (of the Ministry of Finance Working Group) discussed investors having to apply in writing for approval of investments under the automatic route, and meetings needing to be held by the Reserve Bank of India to approve the same. Further, while investments would be routinely approved at meetings, the Reserve Bank of India, in the past, would often not schedule meetings.

Sinha (2010)

These examples show how diverse elements of the overall system of capital controls system were brought into play, in an attempt to regain monetary policy autonomy which was being undermined by partially sterilised intervention which was being used to achieve goals of currency policy.

4 Did the controls achieve their macroeconomic and financial stability objectives?

4.1 The questions

We now examine the empirical evidence on the extent to which these goals were met in three areas: the magnitude of capital flows, the defense of the exchange rate regime, and financial stability considerations.

However, this analysis is faced with an identification problem: We observe the treatment (India with a certain strategy for capital controls), and we observe the outcomes. By itself, this does not identify the effect of the treatment. Hence, we pursue two approaches. In some cases, it is possible to ask: *Did policy makers achieve the desired goal using the treatment?* Answers to such questions do not constitute a rigorous measure of the treatment effect. For example, it can always be argued that the treatment had a positive effect, but other factors overwhelmed these effects and caused the policy failure. Even so, such analysis contribute to the informal wisdom of economic policy formulation, since they suggest that the positive effects may not be as large as hoped. In addition, in some cases, it is possible to compare the Indian outcome against that of other emerging markets which did not have the treatment (i.e., whose controls are generally not as restrictive as in India), which gives some insight on the treatment effect.

4.2 Was India able to hold down the magnitude of capital inflows?

Comparison against India's historical experience *Did India's elaborate system of capital controls, accompanied by myriad attempts at using administrative controls to retard capital inflows, ensure that only a modest scale of capital inflows took place in the boom of 2003-2007?* Figure 5 shows the time-series for annualised capital inflows. At each quarter, the sum of the latest four values is shown.

Figure 5 The magnitude of capital inflows

(a) Measured in USD

(b) Relative to GDP
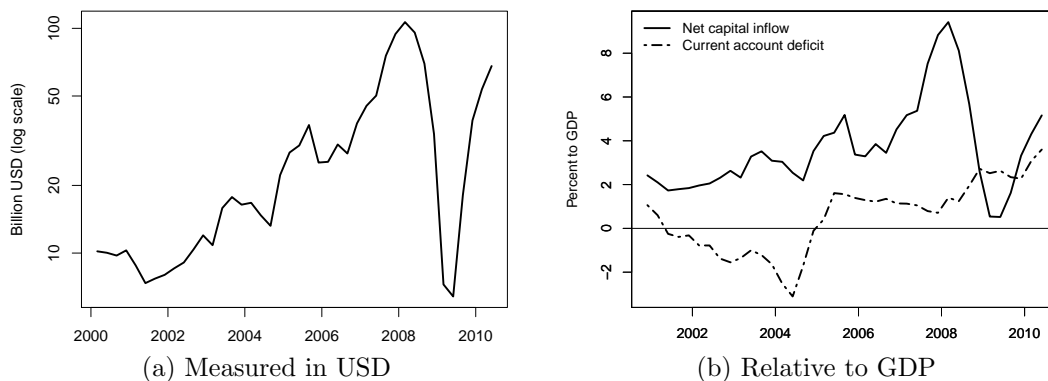
Expressed in US dollars, capital inflows increased steadily, from around 10 billion USD a year in the early 2000s to 100 billion USD a year by early 2008. Although the economy was growing very rapidly during this period, inflows were growing even faster; at its peak, capital inflows reached 9 per cent of GDP. This was a large scale of capital inflow by any standard. If one goal of the Indian capital controls was to prevent a capital surge, this goal was not achieved.

Given the array of administrative restrictions which were feasible in the capital controls regime, and were used in this period, the failure to have a large impact upon capital inflows appears puzzling and merits further exploration. As an example, we examine one episode of the controls closely. On 21 May 2007, faced with difficulties in upholding the exchange rate regime, fresh restrictions upon capital inflows were brought in by *decreasing* these limits for the highest interest rate that could be paid. There was a 50 basis point reduction for the maturity from three to five years: Now companies could only borrow if their cost of borrowing was lower than 150 basis points. There was a 100 basis point reduction for the maturity of above five years: Now companies could only borrow if their cost of borrowing was lower than 250 basis points. This constituted a fresh *restriction* upon capital inflows: Firms which were able to borrow below the old ceiling but not above the new ceiling were barred from undertaking dollar denominated borrowing.

Table 3 compares the quarterly data for capital inflows for the four quarters before the capital control was introduced against the four quarters after. The controls seem to have been effective in arresting the rapid rise in foreign currency borrowing. But net capital inflows

Table 3 Did the capital control of 21 May 2007 matter?

On 21 May 2007, the system of capital controls was used in an attempt to reduce capital inflows. For dollar denominated borrowing of maturity between three to five years, the maximal interest rate that the Indian borrower was permitted to pay was dropped from 200 to 150 basis points above LIBOR. For borrowing of maturity above five years, this ceiling was dropped from 350 to 250 basis points. Firms which were able to borrow below the old ceiling but not above the new ceiling were thus barred from undertaking dollar denominated borrowing.

Quarter ended	Foreign curr. borr.	Other capital inflows	Total
Jun 2006	3,978	6,747	10,725
Sep 2006	1,760	6,100	7,860
Dec 2006	4,049	6,766	10,815
Mar 2007	6,316	9,487	15,830
Jun 2007	6,944	8,754	15,698
Sep 2007	4,217	29,007	33,224
Dec 2007	6,240	23,399	29,639
Mar 2008	5,209	22,815	28,024

of all kinds *other* than such borrowing grew dramatically in the period after the capital control was introduced, soon far surpassing the amount brought in as registered foreign borrowing. In the end, it does not appear that the control had much effect on aggregate inflows.

One year later – on 29 May 2008 – this capital control was rescinded, since global credit market conditions had changed dramatically. After the Lehman shock, some of the safest Indian firms were unable to borrow at rates of 200 or 350 basis points above LIBOR (for maturities from three to five years, and for maturities above five years, respectively). In October 2008, these ceilings were then shifted to 300 and 500 basis points above LIBOR.

Why did these capital controls fail to make a difference to the aggregate volume of flows? One example illustrates the responses of economic agents to the shifting controls. On 7 August 2007, a fresh capital control was brought in against foreign currency borrowing: Foreign currency borrowing was *restricted to be used for the purpose of importing capital goods.*

Firms seem to have responded to this by buying more imported capital goods. As Figure 6 shows, the capital control of 7 August 2007 gave a surge of imports of capital goods. Domestic firms may have substituted away from domestic capital goods in order to obtain cheap credit. On

Figure 6 Capital controls that encourage import of capital goods

On 7 August 2007, a fresh capital control was brought in against foreign currency borrowing. Foreign currency borrowing was restricted to be used for the purpose of importing capital goods. As the graph shows, this gave a surge of imports of capital goods; domestic firms may have substituted away from domestic capital goods in order to obtain cheap credit. On 23 October 2008, when this end-use restriction was rescinded, imports of capital goods dropped sharply. The figure below presents the seasonally adjusted levels of capital goods imports and domestic capital goods production index, both indexed to Jan-2004 as 100.
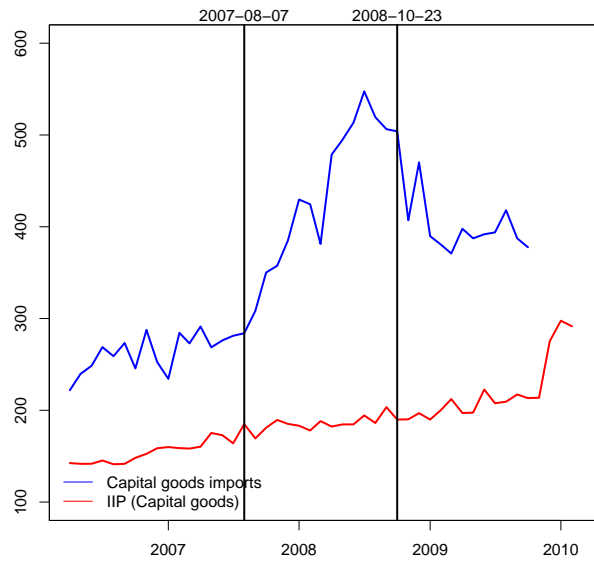
23 October 2008, when this end-use restriction was rescinded, imports of capital goods dropped sharply (Figure 6).[6] The lower line shows the time-series of domestic capital goods production.

Another channel for *de facto* openness of the capital account is trade misinvoicing. To the extent these channels exists, the ineffectiveness of capital controls is under-stated when measured as the total flows on the capital account.[7]

Global Financial Integrity has estimated that Indian residents illegally hold roughly $0.5 trillion outside the country, despite near-comprehensive restrictions against outbound flows until very recently. To the extent that this estimate is on track, it suggests that the capital controls regime is relatively ineffective.

Comparison against other emerging markets While peak capital inflows of 9 per cent of GDP are large by any standard, the counterfactual question remains: *Would this boom have been even bigger if the capital controls had not been present?* In order to shed some light on this question, we compare India against other emerging markets.

Figure 7 compares annual net capital inflows in India against Brazil and against the overall average for emerging and developing countries. It is hard to argue that India's controls made a significant difference, as the figure shows a bigger capital surge for India when compared with these peers.

Table 4 compares a group of large emerging markets on the *de facto* capital account integration, using the Lane and Milesi-Ferreti database, where official reserves are excluded in order to focus on the behaviour of the private sector. The gross investment position is defined as a country's external assets plus liabilities minus reserves as a share of GDP. This measure is similar to the trade openness measure that adds exports and imports to measure a country's openness. At the same time, we exclude central bank reserves held in foreign currencies in order to capture private assets and liabilities position.

In the Indian case, this gross investment position rose by 43 percentage points from 2000 to 2007. This value was not much unlike the average

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[6]We estimated an ARIMA model of the seasonally adjusted growth rate of capital goods imports along with a dummy for the period during which the rupee-related restrictions were in place, after controlling for the world price of capital goods. The coefficient on the dummy variable is significant and positive.

[7]*See:* Patnaik, Sengupta, and Shah (2009).

Figure 7 EM capital inflows

Net Capital Inflows
(In percent of GDP)

Source: IMF, WEO database.
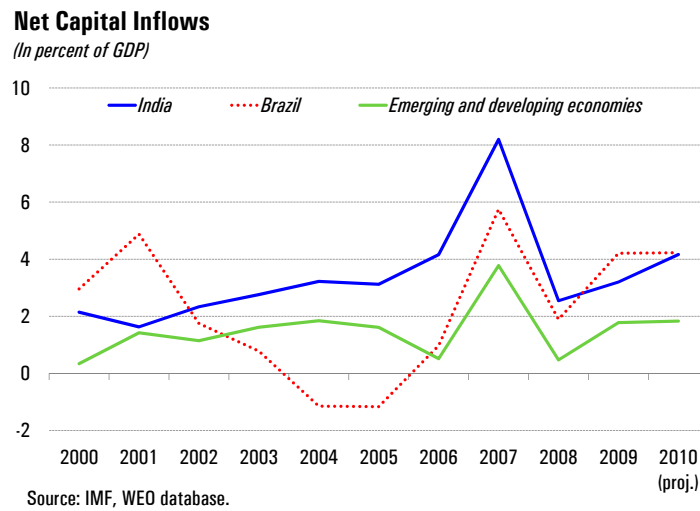
Table 4 *De facto* integration: the Gross Investment Position (excluding reserves)

Country	1990	2000	2007	Change 1990 to 2000	2000 to 2007
India	30	42	85	12	43
Brazil	40	80	103	40	23
South Africa	52	144	175	92	31
South Korea	34	79	135	45	56
Turkey	35	77	101	42	24
BSST average	40	95	128	55	33
China	38	70	113	32	43
Russia		173	179	–	6

Source: Lane and Milesi-Ferreti (2007)

Figure 8 Volatility of the INR/USD exchange rate

Each point on the curve is the annualised volatility of the rupee-dollar exchange rate in a two year (centred) window. In the first phase, which lasted 4.74 years, rupee volatility was 1.97 per cent. On 23 May 2003, when the period of full sterilisation ended, volatility doubled to 3.93 per cent. This lasted for 3.84 years. On 23 March 2007, volatility doubled again to 8.77 per cent. This third period has lasted 4.03 years.
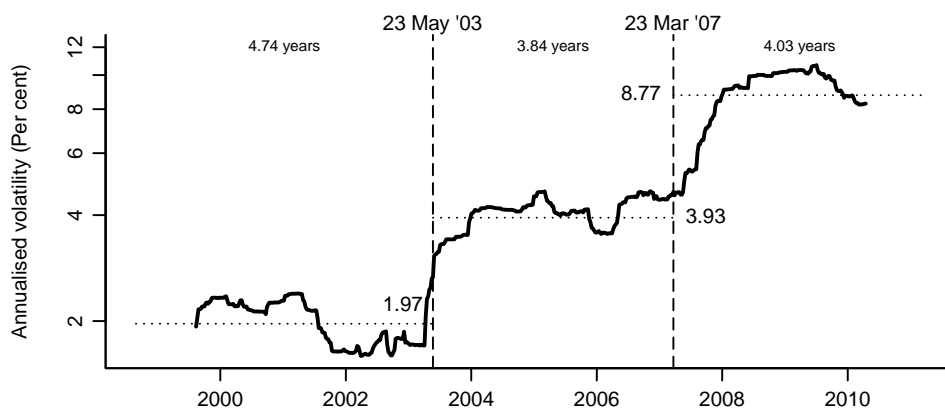
of 33 per cent of GDP that is observed for India's peers.

At a minimum, this suggests that the magnitude of capital which came into India in the 2000-2007 boom was not significantly unlike that seen in other large emerging markets, many of which lacked a complex Indian-style capital controls regime.

4.3 Was India able to uphold the exchange rate regime?

By early 2003, the strategy of exchange rate pegging based on full sterilisation had run its course, as reserve money was entirely formed of foreign exchange reserves. While the bilateral rupee-dollar volatility had been 1.96 per cent per year from 28 September 1998 until 16 May 2003, this volatility was allowed to rise to 3.9 per cent per year when the period of full sterilisation ended.

This modified exchange rate regime once again came under stress with large capital inflows. The explicit fiscal costs, of interest payments on the 'market stabilisation scheme' (MSS) bonds which were issued for the purpose of sterilisation, were building up. The central bank purchased dollars in order to uphold the exchange rate regime, but with only partial sterilisation, this

generated expansionary monetary policy. This monetary policy stance kicked off the country's largest-ever credit boom. At a time of buoyant business cycle conditions, monetary policy exacerbated the expansion.

In early 2007, the central bank was buying dollars on a substantial scale.[8] As a consequence of the difficulties this created, on 23 March 2007, a second structural break in the exchange rate regime can be seen in the data; the bilateral rupee-dollar volatility went up to 8.97 per cent per year in the period following this period up until December 2010. In other words, the Indian system of capital controls did not deliver the ability to uphold a pegged exchange rate.

The first phase – with an annualised rupee-dollar volatility of 1.97 per cent and full sterilisation – had lasted 4.74 years. The second phase – with an annualised rupee-dollar volatility of 3.9 per cent, partial sterilisation and capital controls – had lasted 3.84 years. This third period – of high exchange rate flexibility – which continues into the present, has thus far lasted for 4.03 years. It has thus already proved more durable than its predecessor.

## 4.4   Was India able to achieve financial stability?

We now turn to the empirical evidence about the extent to which the capital controls regime delivered on the goals of financial stability.

However, there is a complexity in the interpretation of this evidence. While India has a complex capital controls regime, it has certain features which are inimical to financial stability. As an example, it favours dollar denominated borrowing over rupee denominated borrowing. Similarly, it encourages foreign participation in OTC currency derivatives markets, while blocking foreign participation in exchange-traded currency derivatives. Thus, by its very design, the existing capital controls regime is not fully aligned with the goal of financial stability. To this extent, the observed outcomes described ahead are somewhat unsurprising. At the same time, these problems are a reminder of the difficulties of capital controls: it should not be assumed that a government which brings in capital controls will do so in an error-free manner.

The credit boom Credit booms are a recurring feature of emerging market crises that have been linked to capital flows. It is hence interesting to

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[8]In February 2007, the central bank purchased $11.86 billion, or 7.8 per cent of reserve money.

Figure 9 The credit boom
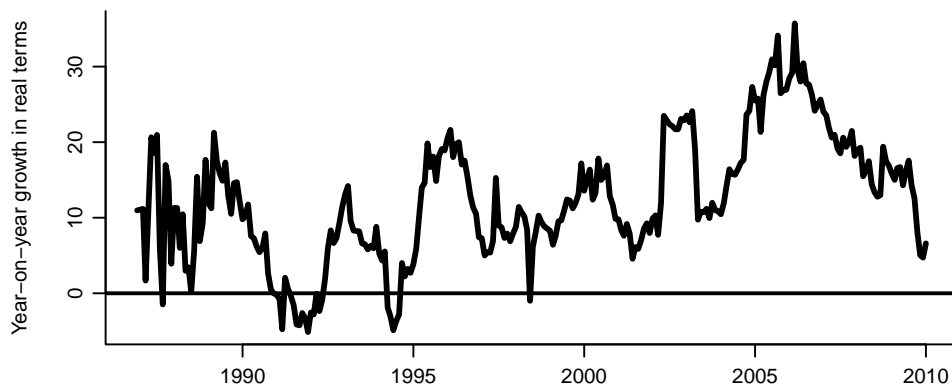
ask: *Did the Indian capital controls regime defuse a credit boom in the pre-crisis period?*

Figure 9 shows the 25 year time-series of year on year growth of private credit of banks, termed 'non food credit' in India. This shows that in the post 2005 period, there was an unprecedented credit boom by historical Indian standards. Year on year credit growth peaked at 39.6 per cent in March 2006. This was a substantial credit boom by any standard. If one goal of the Indian capital controls was to avoid credit booms, this goal was not achieved.

International comparison on credit booms While year on year growth in bank credit of 35.72 per cent, in real terms, is large by any standard, the counter-factual question remains: *Would the credit boom have been even bigger if the capital controls had not been present?* In order to shed some light on this question, we compare India against other emerging markets.

Figure 10 suggests that the magnitude of the credit boom which was triggered off in India in the 2000-2007 expansion was bigger than that seen in other large emerging markets, many of which lacked a complex Indian-style capital controls regime.

Currency exposure of firms One argument which can be made in favour of the Indian-style capital controls is that of avoiding balance sheet crises when large currency depreciations take place. It is argued that capital controls which prevent firms from foreign-currency denominated
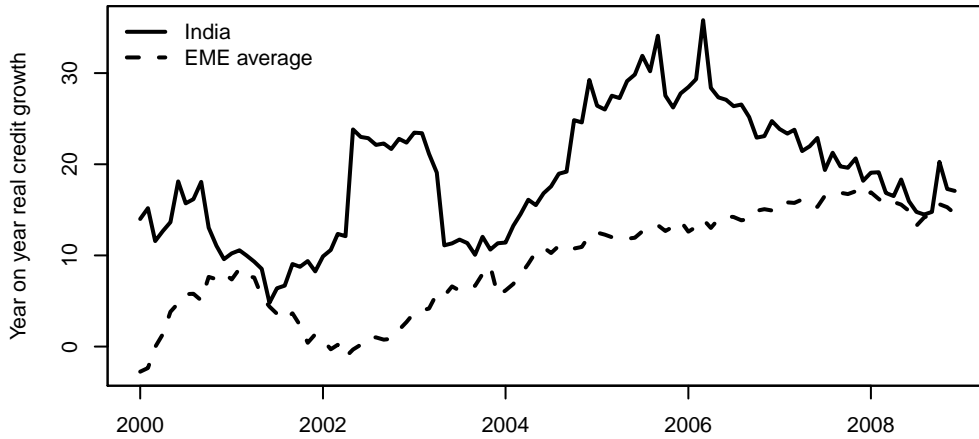
26

Figure 10 The credit boom - in comparison

Table 5 Exchange rate flexibility and the currency risk of firms

Period	Daily INR/USD volatility	Average currency risk of firms
1 April 1993 to 17 February 1995	0.16	5.899
17 February 1995 to 21 August 1998	0.93	0.540
21 August 1998 to 19 March 2004	0.29	3.753
19 March 2004 to 31 March 2008	0.64	2.066

borrowing are a useful component of policies which encourage financial stability. It is hence useful to ask: *Did the Indian capital controls regime ensure that firms were not able to take on unhedged foreign currency exposure?*

A study measuring unhedged currency exposure (Patnaik and Shah, 2010) measures the currency risk of large Indian firms from 1993 to 2008 (pre-crisis). This is an interesting period in that rupee-dollar volatility changed significantly across four sub-periods. Table 5 shows how the exposure of large Indian firms varied across changes in the exchange rate regime. Exchange rate volatility in these four periods was low, high, low and high. Unhedged currency risk, of the firms

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Figure 11 Breakdown of the operating procedure of monetary policy
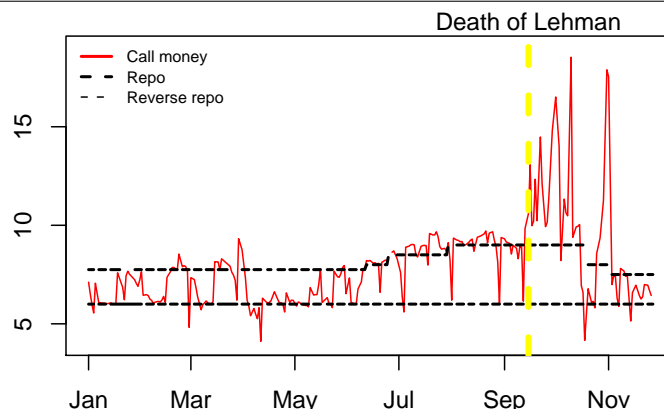
shows the opposite pattern: high, low, high and low. When exchange rate flexibility went up, unhedged currency exposure went down, and vice versa.

This evidence has two implications for the present discussion. First, when exchange rate flexibility in India went down, the capital controls regime was not able to prevent firms from taking on currency exposure, despite the presence of restrictive rules governing foreign borrowing. In addition, this evidence emphasises the moral hazard argument: firms are likely to reduce their unhedged currency exposure when the exchange rate is more flexible. This emphasises the critical role of the exchange rate flexibility, rather than the capital controls regime, as a tool for achieving financial stability.

Money market disruption when Lehman failed In September 2008, the prevailing capital controls regime in India involved severely circumscribing banks ability to incur short-term debt and comprehensively preventing Indian firms from obtaining short-term foreign currency borrowing. The rules in place for firms required a minimum maturity of foreign borrowing of 3 years, and there was a quantitative restriction on the overall borrowing by all Indian firms, put together. It is hence interesting to ask: *Did the Indian capital controls regime yield a small or negligible disruption on the Indian money market, after Lehman failed?*

Figure 11 shows the fluctuations of the Indian overnight rate, the "call money rate", juxtaposed against the two policy rates which are intended to bracket the call money rate. The operating procedure of monetary policy involves ensuring that the call money rate stays be-

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tween these upper and lower bounds. However, when the Lehman bankruptcy took place, the operating procedure of monetary policy immediately came under enormous stress, and was unable to prevent the call money rate from tripling,[9] in part because firms that had financed themselves abroad suddenly turned to the domestic market when foreign lines were cut. This disruption was one of the most sizable in Asia, a striking result for a country that on most conventional measures is one of the least financially integrated of the major emerging markets. In any case, if one goal of the Indian capital controls was to prevent global shocks on the money market from transmitting into India, this goal was not achieved in the Lehman shock.[10]

Was India able to avoid an asset price boom? Foreign capital flows are often pro-cyclical (Kaminsky, Reinhart, and Vegh, 2004). In good times, there are concerns that herding by foreign investors and their use of momentum strategies interact with an illiquid domestic stock market to give very high stock prices. In reverse, the same combination of factors can yield very low stock prices. One argument which could be made in favour of capital controls is that of avoiding a boom-and-bust cycle in asset prices. It is, hence, interesting to ask the question: *Did the Indian capital controls regime deliver a smaller boom-and-bust cycle in asset prices when compared with other emerging markets which have greater openness?*

Table 6 reports the ratio of the highest value of the stock market index to the lowest value of the stock market index in the period from January 2004 and August 2008 (i.e. going up until the Lehman shock). The countries are ranked by the ratio between the lowest value and the highest value of the stock market index over this period. The table shows that among emerging market countries India had one of the biggest asset price booms. A striking feature of this table is the more modest asset price booms in emerging markets with high capital account openness, such as Chile, Israel and Korea, and the more extreme asset price booms in relatively closed economies such as China and India.

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[9]For a more detailed analysis of this episode, see Aziz, Patnaik, and Shah (2008).

[10]Patnaik and Shah (2009-10) offer evidence that Indian multinationals played an important part in these events, arguing that multinationals operating global treasuries were a conduit between global events and domestic money markets. Firms accounting for 56.51 percent of the balance sheet size of Indian companies had outbound FDI; these multinational corporations thus had considerable economic significance relative to the economy.

Table 6 Stock price booms (1/2004 to 8/2008)

Rank	Country	Lowest	Highest	Ratio
1	Peru	2493.81	23789.75	9.54
2	China	1011.50	6092.06	6.02
3	India	1388.75	6287.85	4.53
4	Indonesia	668.48	2830.26	4.23
5	Brazil	17604.00	73517.00	4.18
6	Russia	6378.83	26196.44	4.11
7	Turkey	15922.44	58231.90	3.66
8	Korea	719.59	2064.85	2.87
9	Argentina	839.93	2351.44	2.80
10	Philippines	1388.15	3873.50	2.79
11	Israel	526.97	1189.04	2.26
12	Chile	7074.51	15618.38	2.21
13	Malaysia	781.05	1516.22	1.94
14	Taiwan	5316.87	9809.88	1.85

5 Current thinking on reforms of India's capital controls

In the light of the experiences of recent years, including the Great Recession, how do Indian policy makers envisage the future of the capital controls regime? In 2010, the report of the Ministry of Finance 'Working Group on Financial Flows' was released, which reviewed the full system of capital controls (other than those prevailing for FDI), and proposed reforms (Sinha, 2010).

This report identifies weaknesses of the existing framework of capital controls on the issues of public administration and governance. It argues that capital controls should be seen as an integral part of financial regulation. As a consequence, all our thinking about good governance, as applied in financial regulation, is relevant for capital controls. It states:

> *"While regulators should have the freedom to formulate policies specified in the law, applying policies to individual entities must be consistent, uniform, and transparent.*
>
> *...*
>
> *"To the extent that the application of foreign exchange law affects the ability and extent of individual actors to participate in markets, these rules are a significant part of financial sector regulation. As such, the best practices and basic principles of rule of law that apply to other areas of regulation, should apply to these matters as well. To, for example, meet broad policy objectives through denial of registration, licenses and other permissions leads to effective discrimination between similarly placed actors with regard to important economic opportunities."*

Good governance, and the demands of accountability in a democracy, require a shift away from non-transparent and discretionary power. The key recommendations of the report are:

1. The operations of capital controls should be rooted in the rule of law. This means there should be transparency, legal certainty, public release of reasoned orders, an appeals procedure, etc.

2. The existing capital controls framework, where rules are broken down both by investor class and by asset class, is proposed to be replaced by a 'qualified foreign investor' framework which will only distinguish rules pertaining to capital controls by asset class. Alongside this, the procedures for 'know-your-customer' (KYC) are proposed to be improved, and the information base about foreign investors strengthened in the spirit of India's membership of the Financial Action Task Force (FATF), so as to come up to world standards on checking money laundering and terrorist financing.

3. An operational mechanism is proposed through which global financial firms can sell international products to Indian households (thus catering to capital outflows) while setting up regulatory mechanisms for consumer protection.

4. The restrictions against foreign investment in rupee-denominated debt, which encourage a disproportionate focus upon dollar denominated borrowing by Indian firms, are sought to be eased.

5. The capital controls favouring foreign participation in OTC currency derivatives, but blocking foreign participation in exchange-traded cur-

rency derivatives, are sought to be modified in favour of a capital controls framework that does not disfavour exchange-traded derivatives.

In February 2011, the government took the first steps on translating these recommendations into action, with movement on two fronts. First, the quantitative restriction on rupee-denominated debt was doubled to $40 billion with a focus on rupee-denominated debt issued by infrastructure companies. Second, the first steps in moving away from the FII framework were begun, by permitting foreigners to invest in Indian mutual funds without going through the process of FII registration.

6 Conclusions and areas for further work

Capital controls are of interest as a tool of economic policy from two points of view. On one hand, it is argued that financial globalisation is inimical to financial stability: capital controls are then a method for improving financial stability. In addition, many policy thinkers chafe at the constraints imposed by the impossible trinity. Can a country choose something other than the three corners? Can a country undertake a modest scale of exchange rate policy, but preserve monetary policy autonomy through the use of capital controls?

Do capital controls matter? In the extreme, we can envision a world where one capital control (e.g. a restriction on ADR arbitrage introduced by India) has a zero effect because the required trades get done through other channels. A recent literature (Ma and McCauley, 2008; Levy Yeyati, Schmukler, and Van Horen, 2009) has emphasised that this is not the case in most emerging market settings. In the typical emerging markets, capital controls *are* able to force wedges between prices, generate failures of market efficiency, introduce distortions, etc. In this sense, capital controls *do* matter. However, the right question that needs to be asked is: Do capital controls deliver useful results in the domain of macroeconomic policy, to compensate for these difficulties? That is the stance taken in this paper.

The Indian experience is not encouraging from this point of view. Capital controls did not allow the perpetuation of the pegged exchange rate; policy makers were forced into a floating rate when monetary policy distortions built up and an inflation crisis was set off. In addition, capital controls did not improve financial stability; indeed, in many ways, capital controls worsened financial stability.

In some respects, these results are not surprising. An extensive set of experiences with capital controls from the 1970s and 1980s, which were studied in the academic literature in the 1990s, suggested that capital controls are not useful tools of policy. These experiences lay at the foundation of the academic and practitioner consensus on the question. In the following years, the strong pace of innovation in computer technology and finance has increased the mechanisms through which these controls can be bypassed, which would strengthen the previous consensus. In recent years, the fresh wave of interest in capital controls perhaps reflects a loss of institutional memory about the policy experimentation of the 1970s and 1980s. India's experience, from recent years, is a fresh reminder of the predictive power of the old approach.

6.1 Capital controls as a tool for macroeconomic and financial policy

To summarise, this paper questions the extent to which the Indian capital controls regime can be identified as a useful tool through which the goals of macroeconomic or financial policy were achieved. The evidence offered in this paper suggests that:

1. Despite an unusually restrictive capital controls regime, reinforced by additional measures during the mid-2000s, the system proved extremely porous: a) pre-crisis capital inflows were very large by Indian historical standards; b) pre-crisis capital inflows into India were very large by the standards of emerging markets; there was an unprecedented credit boom.

2. The capital controls regime did not give monetary policy autonomy under a *de facto* pegged exchange rate to the US dollar; India evolved away from this towards greater flexibility in two stages - first in May 2003 and then in March 2007.

3. Despite the controls firms were able to take on or shed currency exposure from their balance sheets, in response to expectations about exchange rate flexibility.

4. The key ingredient for obtaining low currency risk on the part of the firms appears to be high exchange rate flexibility rather than the capital controls.

5. Despite the Indian capital controls regime, when Lehman failed in September 2008, the Indian money market was immediately disrupted; the operating procedure of monetary policy broke down.

6. Despite the Indian capital controls regime, the boom-and-bust pattern in stock prices in India was severe by the standards of emerging markets. Many countries with greater international financial integration obtained a reduced asset price boom.

These arguments suggest that the Indian capital controls regime was not successful in furthering the goals of macroeconomic and financial policy. Indeed, the Indian authorities are no longer attempting to implement a pegged exchange rate while trying to use capital controls to regain monetary policy autonomy. On the contrary, the exchange rate regime moved away from near-complete pegging to the dollar as controls failed to prevent rupee volatility from rising. Further, the Indian authorities have expressed concerns about the problems of governance, rule of law and microeconomic distortions associated with the existing capital controls regime, and have continued with the process of gradual capital account liberalisation.

6.2 Why did controls fail, and what were the costs of this policy?

These empirical facts immediately suggest further questions. Why did India's complex system of capital controls fail to deliver on the goals of macroeconomic and financial policy?

One element that is visible in the Indian evidence is that even when an unusually restrictive and detailed system of capital controls is constructed, it proved highly porous when ex-ante Indian returns were perceived to be high, and where India was integrating rapidly with the rest of the world. Capital controls were effective only in changing the windows through which capital came in.

The precise mechanisms through which capital entered India is an area for further research that will require exploring the interplay between domestic financial development, the rise of Indian multinationals, the mechanisms for arbitrage given a complex administrative system of controls, the incentive implications of exchange rate inflexibility for both currency exposures of domestic firms and the magnitude of capital inflows from foreign investors, and political economy considerations.

The actions of policy makers appear to have exacerbated the problems. On one hand, the slowly appreciating exchange rate, where the central bank was visibly buying dollars every day, gave confidence to the private sector

that the currency was a one-way bet, which further encouraged capital flows. In addition, the focus on the part of the central bank upon the exchange rate and the tactical battles about trying to block capital inflows may have contributed to the loss of focus on the core mandate of monetary policy, on issues such as inflation or financial stability.

6.3 Understanding India's resilience

Diagnosing the sources of resilience of the economy is an important question, in order to assist the formulation of economic policy strategy in India and elsewhere. If the capital controls regime was not central to India's relatively benign experience in the crisis, what were the features of macroeconomic policy which played a useful role? Many factors played a role, including the underlying momentum created by the launching of large investment projects in the years just before the crisis. But in the context of this paper, one critical policy shift is worth pointing out.

On 23 March 2007, the exchange rate regime moved towards greater flexibility, with a bilateral rupee-dollar exchange rate volatility of 9 percent annualised. In the spirit of the arguments presented about moral hazard in currency exposure of firms, *in response* to this increased exchange rate flexibility, firms are likely to have reduced their balance sheet exposure, well before the global crisis. This timing, of shifting to greater flexibility well before the crisis, served India well.

In the crisis itself, the rupee-dollar exchange rate depreciated by 32.8 per cent over the 1.15 years from 9 January 2008 to 3 March 2009. In many countries, such a large depreciation could have triggered difficulties in firms having dollar-denominated debt. These firms may have then engaged in political lobbying to prevent the depreciation, which would in turn require tight monetary policy. However, in India since this depreciation took place in the context of a relatively flexible rate from 26 March 2007 onwards, relatively few firms experienced negative balance sheet effects.

In other words, if greater exchange rate flexibility had not come about in March 2007, there is a possibility that political economy considerations might have forestalled the large exchange rate depreciation during the crisis. In the event, the economy was able to benefit from this 32.8 per cent increase in the prices of tradables which helped sustain the economy in the global crisis.

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