



**Center for Analytical Finance
University of California, Santa Cruz**

Working Paper No. 26

**Foreign Currency Borrowing by Indian Firms:
Towards a New Policy Framework**

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March 31, 2016

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India has a complex multidimensional system of capital controls for foreign currency borrowing by firms. In this paper, we summarize existing regulations, review the outcomes and discuss areas of concern and recent policy changes. Unhedged foreign currency exposure for firms, the complexity and uncertainty in the policy framework as it has evolved, and questions about regulation making processes are highlighted. In an emerging economy with a managed exchange rate and incomplete markets, foreign currency borrowing poses systemic risks when left unhedged by large firms that constitute a significant part of GDP. We identify policy directions to help address these concerns.

JEL Classification: F3, G1, D6

Keywords: Capital controls, External debt, Market failure

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Seed funding for CAFIN has been provided by Dean Sheldon Kamieniecki of the Division of Social Sciences at the University of California, Santa Cruz.

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*We thank Radhika Pandey, Apoorva Gupta, Pramod Sinha, Mohit Desai, Shekhar Hari Kumar and Sanhita Sapatnekar for valuable inputs into this work.

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1 Introduction

A well established concept in the field of international capital flows is the problem of ‘original sin’: where governments or firms have currency mismatches with foreign borrowing that is typically in dollars. When such exposures exist, there is the possibility of substantial balance sheet effects in the event of a large depreciation. In India, foreign currency borrowing has grown seven-fold, from \$20 billion in 2004 to \$140 billion in 2014. This has generated concerns about systemic risk.

Rational firms are conscious about the destruction of wealth that comes with a large depreciation and unhedged exposure, and are likely to avoid currency mismatches. The moral hazard hypothesis suggests that firms *choose* to have unhedged foreign currency borrowing because governments and central banks communicate their intent to manage the exchange rate when faced with large depreciations. Concerns about unhedged foreign currency borrowing by firms are a greater issue in emerging markets where the monetary policy regime targets the exchange rate, as compared with mature market economies with floating exchange rates.

Capital controls are proposed as a way of avoiding moral hazard associated with foreign currency borrowing under pegged exchange rates. The puzzle lies in designing a capital controls system which interferes with unhedged foreign currency borrowing but not with foreign borrowing by firms with hedges. For firms who have natural hedges, unhedged foreign currency borrowing is a valuable source of low cost capital. These firms include not just net exporters, but net producers of tradeables where domestic output prices are set by import parity pricing.

What is a policy framework where hedged firms are able to obtain the economic benefits of unhedged foreign currency borrowing, while avoiding unhedged foreign currency borrowing? One strategy is to combat the moral hazard at the root cause: the monetary policy framework. A monetary policy framework which enshrines inflation as the target, and not the exchange rate, would remove the moral hazard. Inflation targeting central banks are, in general, associated with greater exchange rate flexibility.

The second element of the policy question is the capital controls regime. The Indian strategy for capital controls on foreign currency borrowing presently involves many kinds of restrictions. The dominant form of currency borrowing is “External Commercial Borrowing” (ECB) by companies.¹ Rules

¹The term ECB has a specific meaning in the context of Indian regulations on borrow-

restrict who can borrow, who can lend, how much can be borrowed, at what price, what end-use the borrowed resources can be applied for, who can offer a credit guarantee, when borrowed proceeds must be brought into India, when loans can be prepaid, when loans can be refinanced, procedural rules for all these activities, and rules for banks to force all borrowers to hedge currency exposure. Further, loans above a certain amount require approval.

The present policy framework is highly complex, uncertain, and, as has been suggested by the *Sahoo Committee, Report III* that was set up by the government to review the existing framework, fails to address some of the concerns of policy makers. For example, policy makers are concerned about the level of unhedged foreign currency exposure in the economy, issues of discretion and transparency, and policy uncertainty in the framework. Further, the recent focus on modern regulation making processes and rule of law has raised questions about the appropriateness of the existing policy framework. We compare the present distribution of foreign currency borrowing among firms against a normative ideal (foreign borrowing by naturally hedged firms), and find large deviations.

In recognition of these problems, in recent times, some policy changes have been introduced in the capital controls that may help reduce currency mismatch. These include allowing firms to undertake rupee-denominated ECB, an increase in the caps on FII investment in rupee-denominated corporate bonds (the cap has increased slowly to USD 51 billion in 2015), monitoring of the hedge ratio for ECB by requiring firms to report these, requiring infrastructure firms to fully hedge their ECB and prudential requirements for banks when lending to companies with unhedged foreign currency exposure.

For Indian firms, markets for derivatives are illiquid and costly owing to restrictive regulations, making it unattractive to hedge explicitly through these markets. On the other hand, while some borrowers may have natural hedges, the policy framework for ECB does not take this into account. This helps explain why firms with natural hedges, such as domestic makers of tradeables, are not strongly present in foreign currency borrowing.

The current restrictions on ECBs raise concerns about engaging in ill-defined or poorly justified industrial policy, about the scale of economic knowledge required to write down the detailed prescriptive regulations, the impact upon the cost of business and about rule of law. Recent research suggests that the large number of changes in the capital controls governing ECB are moti-

ing from abroad, and is different from the term “foreign currency borrowing” in several respects. The differences will be made clear later in the paper.

vated by exchange rate policy and not systemic risk regulation. This raises questions about the process through which regulations are being made.

In the international discourse, there is renewed interest in capital controls, in particular in order to address the systemic risk associated with large scale unhedged foreign currency borrowing by firms in countries with pegged exchange rates. The careful examination of the Indian capital controls on foreign currency borrowing suggests that the Indian framework has not been effective in permitting safe activities while reducing systemic risk.

2 Existing regulatory framework

We now describe the present arrangements for capital controls against foreign borrowing by Indian firms. The present policy framework governing foreign borrowing by firms offers two alternative routes:

1. **Foreign currency borrowing:** Firms borrow in foreign currency denominated debt through ECB and trade credit.
2. **Rupee denominated borrowing:** This route allows foreign investors to buy bonds issued locally, denominated in rupees. In this paper we focus on the policy framework for foreign currency borrowing. Neither total borrowing shown in Figure 2 nor financial borrowing shows these figures. Recently ECB in rupees has also been allowed.²

2.1 Foreign currency borrowing

Firms can access foreign borrowing primarily through two routes: Trade Credit and ECB. Trade Credit includes suppliers credit or buyers credit.

ECB is foreign borrowing that is not trade credit, with a maturity greater than three years. There are two routes for doing ECB. Some classes of firms are permitted to borrow under certain conditions through an “automatic” route. When the loan size is above a prescribed limit firms have to apply for “approval”.

²Both foreign purchases of rupee-denominated bonds and rupee-denominated ECB involve foreigners lending money to Indian firms with accounting in rupee terms - only the channel for the transaction is different, but this entails parallel regulations. Of course, in either of these cases, currency mismatch or risk is not an issue.

Table 1 Regulatory sub-categories for ECB and trade credits

Sub-Category	ECB*	Trade Credits Automatic route
Eligibility criteria to borrow	Eligible borrowers	
Controls on eligible lenders	Recognized lenders	
Quantitative caps and maturity restrictions	Amount and maturity	Amount and maturity
Price ceiling	All-in-cost ceiling	All-in-cost ceiling
Permitted activities with foreign exchange	End-use	End-use
Activities not permitted with foreign exchange	End-uses not permitted	
Guarantees by financial institutions	Guarantees	Guarantees
Remittance of borrowed funds into India	Parking of ECB proceeds	
Early repayment of ECB	Prepayment	
Additional ECB for repayment of ECB	Refinancing of an existing ECB	
Legal process	Procedure	Reporting arrangements

*Loans up to a certain ceiling are on automatic route. Beyond that, they have to seek approval.

On November 30, 2015 RBI announced a revised framework of ECB. The revised ECB framework comprises three tracks with varying degrees of restrictions.³

1. Foreign currency denominated ECB with minimum average maturity of 3-5 years.
2. Long term foreign currency denominated ECB with minimum average maturity of 10 years.
3. Indian rupee denominated ECB with minimum average maturity of 3-5 years.

Table 1 summarises the following key elements of control on foreign borrowing.

1. *Eligible borrowers*: The regulatory framework specifies the entities that are allowed to access ECB under Track I, Track II and Track III. As an example, Real Estate Investment Trusts (REITs) and Investment Trusts (INVITs) are allowed to borrow under Track II but are not allowed under Track I. Further, Non-Bank Financial Companies (NBFCs) and NBFCs-Micro Finance Institutions are allowed under Track III but are not allowed to borrow foreign currency denominated ECB under Track I and Track II.
2. *Eligible lenders*: The regulatory framework places restrictions on who can lend to Indian firms. Here also we see differential restrictions under the three

³See *External Commercial Borrowings Policy: Revised Framework*

Tracks. As an example, overseas branches/subsidiaries of Indian banks are allowed to lend under Track I but not in Track II and Track III.⁴

3. *Cap on maximum amount that can be borrowed:* The framework specifies the maximum amount that can be borrowed under the automatic route. In addition, there are separate caps based on the category of eligible borrowers. The cap has increased from USD 500 million in 2006 to USD 750 million at present. If the loan is above this amount it has to go through the approval route.
4. *All-in-cost-ceilings:* An additional dimension of control is the all-in-cost-ceiling. The regulator specifies a maximum level for the overall interest cost at which the borrowing occurs. Only potential borrowers who are able to access funds within this interest cost ceiling are allowed to do so, others may not borrow. At present, the all-in-cost ceiling is 300 basis points over the six-month London Interbank Offered Rate (LIBOR) for foreign currency denominated ECB with minimum average maturity of three to five years (Track I). The cost ceiling is 500 basis points over six-month LIBOR for tenor of more than ten years (Track II). For Track III, the all-in-cost is determined on market conditions.
5. *End use requirements:* The revised framework of ECB prescribes separate end-use requirements for the three tracks of ECB. For Track I the framework lists the purposes for which ECB can be accessed. Track II offers a comparatively liberalised framework with a negative list of purposes for which ECB access is not allowed. Track III offers a marginally liberalised negative list.
6. *Hedging requirements:* There is no mandatory requirement to hedge. The framework maintains that entities raising ECB under Track I and Track II are required to follow the guidelines issued, *if any*, by the concerned sectoral or prudential regulator.
7. *Parking of borrowed proceeds abroad:* If funds are borrowed for rupee expenditure, they are required to be repatriated immediately. In the case of foreign currency expenditure, ECB proceeds may be retained abroad pending utilisation. When retained abroad, the funds may be invested in prescribed assets.
8. *Issuance of guarantee:* The framework prohibits issuance of guarantee; standby letter of credit; letter of undertaking; or letter of comfort by banks, financial institutions and Non Banking Financial Companies from India relating to ECB.

⁴Obviously, restrictions on who can lend are not motivated by concerns about the risks incurred by borrowers, but rather (presumably) by issues such as money laundering and tax evasion.

9. *Prepayment*: The framework allows prepayment subject to compliance with the stipulated minimum maturity restrictions.
10. *Refinancing of existing ECB*: Borrowers are allowed to refinance their existing ECB by raising a fresh ECB, subject to the condition that the fresh ECB is raised at a lower all-in-cost ceiling, and provided the residual maturity is not reduced. Such refinancing is not permitted by raising fresh ECB from overseas branches or subsidiaries of Indian banks.
11. *Procedural complexities*: The regulatory framework prescribes a detailed framework for raising funds through ECB. Entities desirous to raise ECB under the automatic route are required to approach an Authorised Dealer bank with their proposal along with duly filled in Form. The Authorised Dealer shall ensure that the ECB is in compliance with applicable guidelines. For cases involving approval, the borrowers may approach the RBI with an application in prescribed format through Authorised Dealer bank. Such cases are considered by an Empowered Committee set up by RBI.
12. *Hedging requirements implemented through banking regulation*. On 15 January 2014, India issued a set of guidelines or recommendations in the form of an informal 'regulation' titled *Capital and provisioning requirements for exposures to entities with unhedged foreign currency exposure*. In this, banks are asked to provision more, and hold more capital, when faced with a borrower who has unhedged currency exposure. This 'regulation' features a certain approach on defining and measuring unhedged currency exposure.

3 Broad facts about firm foreign borrowing

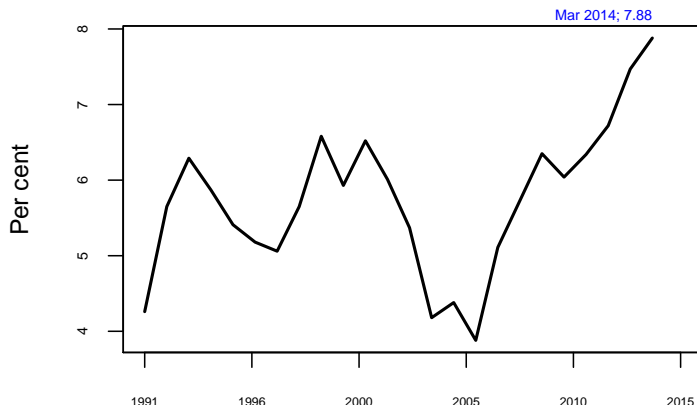
In this section, we show broad empirical facts about foreign borrowing by Indian firms, and descriptive statistics about foreign borrowing that are obtained from firm level data. In some respects, especially size, the characteristics of firms that avail of FCB are different from their counterparts which do not (or perhaps cannot) do so. In other characteristics, FCB and non-FCB firms are not very different.

3.1 Time series aggregates

Figure 1 shows the ratio of outstanding external commercial borrowing (ECB) to GDP.⁵ ECB as a ratio of GDP stood at 7.9% at the end of 2013-14. There

⁵ECB data has been sourced from *India's External Debt: A Status Report* which is released by the Ministry of Finance.

Figure 1 ECB as per cent of GDP



is some year-to-year variability in this ratio, but we do not wish to speculate as to the causes, and there are not enough years of data to claim any trend.

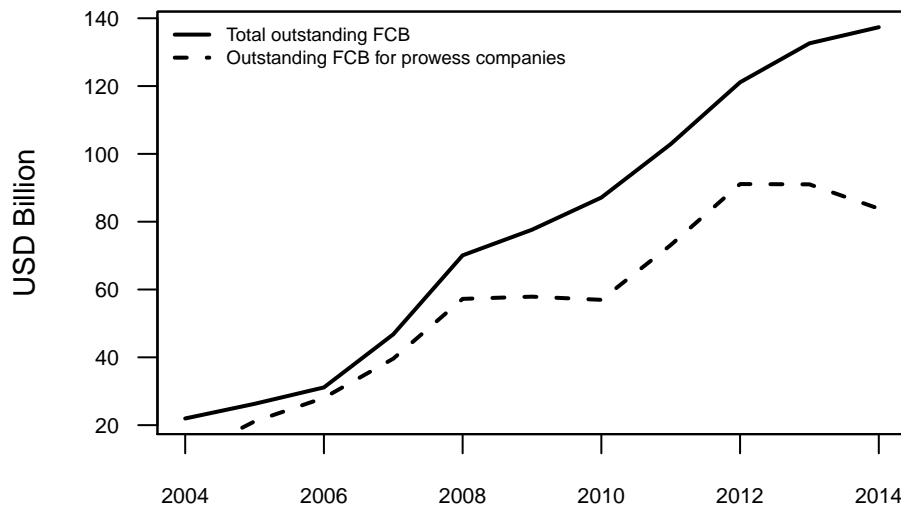
3.2 Firm-level borrowing

We now describe foreign currency borrowing using firm level data, drawing upon the CMIE database. We focus on non-financial firms only, in order to avoid non-comparability of accounting information between financial firms and non-financial firms. ECB is not directly visible in the data. We observe foreign currency borrowing (FCB), which measures debt taken by a company denominated in a currency other than the Indian rupee, from any source.⁶ This definition includes trade credit. In other words, we observe FCB which is the sum of ECB and trade credit.⁷ We are not able to disentangle ECB

⁶The definition of FCB in the CMIE database is: *Any loan taken by the company in a currency other than in Indian rupees is a foreign currency loan. Examples of such loans are loans taken from foreign banks, foreign currency loans taken from foreign branches of Indian banks, foreign currency loans taken from Indian banks, loans taken from EXIM banks, loans taken from multinational lending institutions such as World Bank, IBRD, and Asian Development Bank, external commercial borrowings, suppliers/buyers credit, global depository receipts and American depository receipts.*

⁷A further caveat should be noted, namely that the accounting of both ECB and trade credit in the data is not quite complete. For example, firms may receive and pay off trade credit within a period short enough for it not to appear in a year-end balance sheet. Another possibility is that some ECB is received in tranches, and, if paid off early, may also not appear in the observed balance sheet. In some sense, while it would be ideal to measure these more transitory instances of borrowing, they are of less concern precisely because they do not show up on balance sheets.

Figure 2 Aggregate firm level FCB versus total FCB



from trade credit. We examine the period from 2004 to 2015, which yields a dataset consisting of 155,459 firm-years.

Figure 2 juxtaposes the FCB of the firms in our dataset against the total ECB of the country. Borrowing by the firms in our dataset is overstated to the extent that it also contains trade credit. This graph suggests that our data set captures a significant portion of the country's foreign borrowing.

Table 2 Descriptive statistics for 2011-12

Size is defined as the three-year average of the total income and total assets of a company. FII holding is defined as the percentage of shares of a company held by non-promoter foreign institutional investors. Exports to sales is the percentage of export of goods and services in total sales. Import to sales is the percentage of import of raw materials, stores and spares, finished goods, and capital goods, in total sales of a company. Debt-to-equity is defined as the difference between total assets and net-worth of a company, divided by its net worth. Interest cover is ratio of the Profit before Tax and Depreciation (PBDITA) and interest expenses of a company. Total trade to sales is the sum of exports and imports as a percentage of total sales.

Variable	Category	Mean	SD	Min	25th	Median	75th	Max	Observed
Size (Rs. Million)	FCB firms	32790.49	153958.44	7.80	1672.40	5518.50	17105.05	2757054.80	907
	Non-FCB firms	3300.65	23200.35	0.10	30.10	218.00	1181.30	1322338.00	9962
FII holding (Per cent)	FCB firms	7.95	8.75	0.00	0.86	4.87	12.63	52.99	368
	Non-FCB firms	6.21	8.30	0.00	0.27	2.69	9.18	58.45	843
Exports to sales (Per cent)	FCB firms	22.39	33.59	0.00	0.03	6.86	35.10	453.97	877
	Non-FCB firms	10.89	72.61	0.00	0.00	0.00	3.06	5000.00	7598
Imports to sales (Per cent)	FCB firms	37.38	511.42	0.00	1.17	7.93	23.35	15007.69	877
	Non-FCB firms	69.47	3399.70	0.00	0.00	0.00	1.96	273240.00	7598
Debt equity (Times)	FCB firms	6.25	69.30	-616.84	0.99	1.81	3.08	1714.47	907
	Non-FCB firms	30.56	930.24	-14915.00	0.05	0.83	2.67	65291.00	9857
Interest cover (Times)	FCB firms	29.16	382.16	-173.00	2.03	3.83	8.86	10851.06	874
	Non-FCB firms	72.65	691.24	-4024.00	1.31	2.87	8.88	22238.00	5928
Total trade to sales (Per cent)	FCB firms	59.77	511.74	0.00	6.91	26.11	60.27	15007.69	877
	Non-FCB firms	80.36	3408.47	0.00	0.00	0.00	14.55	273240.00	7598

Table 2 shows summary statistics about one point in time – financial year 2011-12 – for which 10,869 firms are observed. One can immediately see that less than 10 percent of the firms in that year’s sample have documented FCB.

The firms which borrow abroad are, on average, much larger than those which do not. The median size of firms with foreign borrowing is measured as Rs.5518.50 million, while the median size of firms without foreign borrowing is measured as Rs.218.00 million; the firms that borrow abroad are, on average, more than 25 times bigger than the firms that do not. Information asymmetries and other factors captured in the home bias literature suggests that foreign investors are likely to favour large, internationally active and low credit risk firms. This is likely to be exacerbated by Indian capital controls, where all-in cost ceilings impose interest rate caps and thereby limit foreign borrowing to firms with low credit risk. These two issues may be coming together to restrict FCB to much bigger firms.

We examine three internationalisation measures, namely exporting; importing; and foreign institutional investment. Firms that borrow abroad are much more internationalised, by all three measures. Half of the non-FCB firms have zero exports, while the median value of exports for FCB firms is 6.86% of sales. The median value for imports as a percentage of sales is 7.93% for FCB firms, and negligible for non-FCB firms. In terms of foreign institutional investment, the median value for FCB firms is 4.87%, while the median value for non-FCB firms is 2.69%.

Turning to leverage, the median debt equity ratio⁸ of FCB firms is 1.81 while for non-FCB firms it is 0.83. Hence, FCB firms are much more leveraged. At the same time, in 2011-12, according to the standard corporate finance rule-of-thumb measure, the FCB firms were relatively comfortable in managing this borrowing: the median interest cover ratio of FCB firms is 3.83, while for non-FCB firms it is 2.87. At this point, in light of our subsequent discussion, it is important to note that the standard interest cover ratio does not account for the additional risk posed for FCB firms by potential currency fluctuations.

To summarise, evidence suggests that FCB firms are much larger than non-FCB firms;⁹ have more debt financing; are more internationalised and were

⁸Debt equity ratio has been defined as total assets minus net worth, divided by net worth. In other words, the firm’s equity on the balance sheet is represented by net worth, and the residual from total assets is debt.

⁹The concentration of FCB among larger firms can also be illustrated by the following two additional facts gleaned from the data. First, almost all FCB is concentrated among the top size quartile of firms in our sample. Second, the top thirty firms by FCB amounts account for about two-thirds of total FCB in the sample.

Table 3 Trend in FCB firms versus non-FCB firms

The table reports the median values for each variable in 2004, 2008, and 2012. The numbers in the brackets is the Inter-Quartile range.

	Units	Non-FCB firms			FCB firms		
		2004	2008	2012	2004	2008	2012
Size	Rs. Million	128 (475.1)	117.6 (563.55)	218 (1151.02)	696.9 (2617.2)	2292.4 (7203.4)	5518.5 (15432.65)
FII holding	Per cent	0.49 (4.3)	3.07 (9.54)	2.69 (8.91)	1.86 (8.69)	6.66 (11.25)	4.87 (11.73)
Exports to sales	Per cent	0 (6.81)	0 (3.92)	0 (3.05)	2.71 (27.65)	7.62 (38.49)	6.86 (35.07)
Imports to sales	Per cent	0 (4.04)	0 (3.25)	0 (1.96)	3.52 (15.69)	7.73 (20.79)	7.93 (22.18)
Debt equity	Times	0.88 (2.43)	0.88 (2.59)	0.83 (2.62)	1.63 (2.36)	1.9 (2.13)	1.81 (2.08)
Interest cover	Times	3.48 (8.04)	3.8 (8.53)	2.87 (7.57)	4.09 (6.33)	4.47 (6.84)	3.83 (6.82)
Total trade to sales	Per cent	0.32 (20.91)	0 (17.77)	0 (14.55)	15.73 (46.74)	25.95 (55.69)	26.11 (53.36)
Number of Obs.	Number	10115	12331	9962	535	1027	907

more comfortable servicing their debt in 2011-12 subject to the caveat about currency risk noted in the previous paragraph.

Table 3 provides some information on changes in the characteristics of FCB and non-FCB firms by documenting median values and inter-quartile ranges for the years 2004, 2008 and 2012. The size variable is in nominal terms, while the other variables are unit-free ratios. With one exception, there are no strong trends: the exception is in the size variable. Using the change in nominal GDP over this period - which was roughly a tripling of magnitude - as a benchmark, one can note that the change in size of the median non-FCB firm was less than this, while the change in size of the median FCB firm was much larger. It may also be noted that the measures of internationalisation for the median FCB firm: FII holdings and total trade-to-sales also change substantially in the first part of this period.

4 Areas of concern

In this section, we describe the areas of concern associated with foreign currency borrowing by firms in India. The main area of concern is, of course, currency mismatch, with the underlying problems of moral hazard and incompleteness of markets being highlighted. This section then briefly considers the somewhat independent problem of policy uncertainty, and finally brings out the challenges of policy design in this area in the context of more general issues of rule of law and governance quality.

4.1 Currency mismatch

During the East Asian Crisis of 1997, many countries experienced a breakdown in pegged exchange rate regimes, with large depreciations and subsequent greater exchange rate flexibility. Prior to the crisis, financial and non-financial firms in many of these countries had accumulated large stocks of unhedged FCB. These firms experienced credit distress resulting from large unexpected depreciation. Similar problems were also seen in the Tequila Crisis of 1994 in Mexico. In the 2008 Global Financial Crisis, many East European firms and households were adversely affected through currency mismatch.

Following on the crises of the 1990s, the literature has emphasised the problems of currency mismatch deriving from the ‘original sin’ of borrowing in foreign currency (Krugman, 1999, Razin and Sadka, 2001, Aghion, Bacchetta, and Banerjee, 2001, Céspedes, Chang, and Velasco, 2002, Jeanne, 2002). Isolated mistakes in commercial judgement made by a few firms are not a cause for concern. However, if a large fraction of a country’s corporate balance sheets are denominated in foreign currency and, if a significant fraction of firms face credit distress when a large depreciation takes place, there is an adverse impact upon the country as a whole. Firms facing credit distress may go bankrupt, which induces bankruptcy costs. Even if they do not, distressed firms may have reduced ability to finance investment and, if there are enough distressed firms, there are adverse affects on macroeconomic conditions. Hence there can be a market failure in the form of externalities imposed upon innocent bystanders, when a large fraction of a country’s corporate balance sheets have a substantial currency mismatch.

In the early decades of the international finance literature, a simplistic approach gained prominence, where it was argued that debt flows are dangerous

while equity flows are safe. In recent decades, understanding of the topic has been clarified, and a more nuanced position has gained ground. The understanding today emphasises the dangers that arise out of a combination of the following three elements:

1. *A managed exchange rate.* This can potentially yield a large and sudden depreciation.
2. *A class of firms which have large unhedged foreign borrowing and low ability to absorb shocks.* Vulnerable firms are those with two characteristics: a) they have substantial foreign currency borrowing; and b) they have small amounts of equity capital which can absorb these shocks.
3. *This class of firms must be large when compared with GDP.* If this condition is not satisfied, then foreign currency exposure is just an ordinary business risk that some firms bear.

For example, if 20% of firms (by balance sheet size) stand to lose 20% of their equity capital in the event of a large and sudden 20% depreciation, there is little cause for concern. If, however, 50% of the firms (by balance sheet size) stand to lose 50% of their equity capital in the event of a sudden 20% depreciation, there is cause for concern. Similarly, large sudden depreciations are less frequent if the exchange rate is more flexible.

Consequently, concerns arise when faced with the combination of a pegged exchange rate, and large scale unhedged foreign currency borrowing by firms in the presence of small equity buffers.

We now turn to the question of why a large number of firms carry unhedged currency exposure.

4.1.1 Mismatch owing to moral hazard

The ‘moral hazard’ hypothesis (Eichengreen, Hausmann, and Panizza, 2007) argues that firms fail to hedge currency exposure, as they believe that the government will manage the exchange rate. When the government makes explicit or implicit promises about currency policy, it encourages firms to leave their exposure unhedged.

If the exchange rate regime were to feature a market determined exchange rate for small changes in the exchange rate, while preventing large changes from coming about, firm optimisation would lead them to hedge against small changes but not against large changes.

For example, a firm may use a currency futures contract as a linear hedge, but simultaneously derive revenues from selling options with strikes at $\pm 5\%$, to express the view that the government will not permit the exchange rate to change by more than 5%. This would reduce the cost of the hedge.

The moral hazard hypothesis relies on rational and sophisticated firms that understand the *de facto* exchange rate regime (which may differ from the *de jure* exchange rate regime) to make decisions about taking on or laying off exposure. These conditions are more likely to be met in large, financially complex and internationally active firms.

Under the moral hazard hypothesis, currency policy is the root cause of currency mismatch; reducing exposure would therefore involve removing the explicit or implicit promises to protect firms from exchange rate fluctuations.

A feedback loop can potentially arise, where currency policy gives rise to currency mismatch (owing to moral hazard) and, once a large number of firms leave their exposure unhedged, they mobilise themselves politically to perpetuate the currency regime. This can generate a ‘fear of floating’ trap where a country finds it hard to reform the exchange rate regime in favour of a market determined exchange rate.

4.1.2 Mismatch owing to incomplete markets

An alternative hypothesis emphasises the difficulties faced by firms when trying to hedge. The ‘incomplete markets’ hypothesis asserts that it is in the self-interest of firms to not hold currency exposure, but that attempts by firms to hedge are hampered by the inadequacies of the currency derivatives market. In particular, long dated borrowing would call for long-dated derivatives contracts. These contracts are often not traded on the market, and have to be constructed either through rolling over (for linear exposure) or through a dynamic trading strategy (for non-linear exposure). In an illiquid market, the transaction costs incurred may be prohibitive.

Under the incomplete markets hypothesis, firms are victims of exchange rate fluctuations that they are unable to hedge against. This suggests a policy response grounded in exchange rate policy (in order to protect firms) and market development (in order to obtain a more liquid currency derivatives market). Of course, a managed exchange rate policy will introduce the problem of moral hazard discussed earlier.

4.1.3 Evidence from India

RBI officials have time and again warned companies about unhedged foreign currency exposure. According to a speech by RBI Deputy Governor, H.R. Khan on October 4th, 2014, the hedge ratio for external commercial borrowings and foreign currency convertible bonds came down from 35% in 2013-14 to just 15% in July-August 2014. The Deputy Governor expressed the concern that:

“Large scale currency mismatches could pose serious threat to the financial stability in case exchange rate encounters sudden depreciation pressure. It is absolutely essential that corporates should continue to be guided by sound hedging policies and the financing banks factor the risk of unhedged exposures in their credit assessment framework.”

RBI's Executive Director G. Mahalingam, in his address as keynote speaker on February 27, 2015 reiterated that unhedged corporate exposure remains a major risk factor. He remarked that:

“The outstanding US dollar credit to non-bank borrowers outside the US has jumped from USD 6 trillion to USD 9 trillion since the Global financial crisis. This could expose the corporates in EMEs with large forex exposure to significant interest rate and currency risks unless these positions are adequately hedged.....
...A point of comfort for India is that the Indian corporates do not contribute significantly to this increased exposure (basically because of the macro prudential measures put in place in India); however, if a wave of corporate defaults happen in other EMEs, this can lead to some cascading impact on India and its financial markets.”

The RBI Governor in his post policy briefing on April 7, 2015 warned companies against keeping their foreign currency exposures unhedged, saying they might face “big risk” in the event of change in the monetary policy globally.

Patnaik and Shah, 2010 use a natural experiment in changes of the exchange rate regime, to explore the moral hazard versus the incomplete markets hypothesis on the currency exposure of firms. India's exchange rate regime went through structural change, with low flexibility (1993-04-01 to 1995-02-17); followed by high flexibility (1995-02-17 to 1998-08-21); followed by low flexibility (1998-08-21 to 2004-03-19); followed by high flexibility (2004-03-19 to 2008-03-31). This offers an opportunity to examine changes in the cur-

Table 4 The four periods of varying exchange rate flexibility

	Dates	INR/USD weekly vol.	β_2
1	1993-04-01 to 1995-02-17	0.16	5.899
2	1995-02-17 to 1998-08-21	0.93	0.540
3	1998-08-21 to 2004-03-19	0.29	3.753
4	2004-03-19 to 2008-03-31	0.64	2.066

rency exposure of firms. The paper finds that the currency exposure of large firms was high, low, high and then low through these four periods.

Using an ‘augmented market model’, where the sensitivity of the valuation of firm is measured to changes in the exchange rate, the paper finds that in Period 1, starting from 1st April 1993 to 17th February 1995, where currency flexibility was limited, the exposure of firms was considerable. In Period 2 from 17th February 1995 to 21st August 1998, where high currency volatility was observed, the exposure of firms fell dramatically. In Period 3, starting from 21st August 1998 to 19th March 2004 where currency flexibility again dropped, the exposure of firms rose. Finally, in Period 4, starting from 19th March 2004 to 31st March 2008, where greater currency volatility came about, currency risk dropped sharply.

This is consistent with the moral hazard hypothesis: firms changed their exposure when the *de facto* exchange rate regime changed. This is also inconsistent with the incomplete markets hypothesis: firms *were* able to execute the changes in exposure in response to changes in the exchange rate regime.

4.2 Policy uncertainty

The Indian authorities have, on many occasions, used tightening and easing of capital controls on foreign borrowing. Pandey et al., 2015 examine the causes and consequences of these actions. This paper analyses 76 capital flow measures (CFMs) that were observed from 2003 to 2013. Of a total of 76 events, 68 were easing and 8 were tightening.

In terms of the causes of these CFMs, the main finding concerns exchange rate movements. It appears that capital controls against ECB were eased after significant exchange rate depreciation. This suggests that the authorities may have been using capital controls against foreign borrowing as a tool for currency policy.

In order to obtain causal identification of the consequences of CFMs, the

paper identifies pairs of periods with similar conditions (through propensity score matching), where in one case the CFM was employed but in another case the CFM was not. This permits a matched event study methodology which would measure the causal impact of the CFM. The main finding of the paper is that there was little causal impact upon various outcomes, including the level of the exchange rate.

4.3 Sound practices in governance and the rule of law

Section 2 describes the existing policy framework and the processes through which this policy framework is implemented. This raises the following concerns:

Industrial policy When the law favours certain industries over others, without a clear and explicit economic rationale, it constitutes ill-defined industrial policy. As an example foreign borrowing is allowed for working capital requirements for civil aviation sector but not for other sectors.

Economic knowledge required to write down detail When the law gives detailed and bright line regulations, it raises concern about the foundations of economic knowledge that are required. For example, the law permits firms to borrow when their all-in cost is below LIBOR + 300 basis points, but blocks firms when their all-in cost is above LIBOR + 300 basis points. Such detailed regulations would need to be backed by sophisticated economic reasoning that demonstrates the presence of a market failure, and that the intervention addresses this market failure.

The cost of doing business The complex policy framework induces delays, uncertainty and costs of compliance, including legal fees.

Rule of law Under the rule of law, six features should hold: 1) the law should be comprehensible and known to all citizens; 2) identically placed persons should be treated equally; 3) outcomes of prospective transactions should be predictable to practitioners; 4) there should be no arbitrary discretion in the hands of officials; 5) reasoned orders should be given out for all actions; and 6) the orders should be subject to efficacious appeal. There is currently work underway to improve financial sector regulation on all these areas through the implementation of FSLRC non-legislative handbook, as discussed in Section 5.2.5.

5 Recent evolution of policy

This section offers a description of recent policy initiatives in the arena of foreign currency borrowing. Of course, any changes in one area have to be in concordance with, and coordinated with, other aspects of the policy with respect to engagement with the international financial system, as the earlier discussion of ECB policy and exchange rate policy illustrates.

5.1 The Sahoo Committee report on ECB framework

The Sahoo Committee was set up in 2013, to develop a framework for access to domestic and overseas capital markets. The third report of the Committee focussed on rationalising the framework for foreign currency borrowing in India. The Committee recommended that regulatory interventions must be guided by an analysis of potential market failures, and must seek to target and correct those failures. The most critical market failure associated with ECB was identified to be externalities arising from systemic risk, on account of currency exposure.¹⁰

The key observation of the report is that if there are numerous firms that undertake foreign currency borrowing, but do not hedge their currency exposure, there is a possibility of correlated failure of these firms if there is a large exchange rate movement. The negative impact of this movement on their balance sheets could then hamper investment, and the country's Gross Domestic Product. This imposes negative externalities which constitute a market failure.

The Committee observed that, at present, there is an array of other interventions aimed at addressing the process of foreign currency borrowing. Most of these interventions were brought in to meet the specific needs of the hour, and have arguably outlived their utility. None seem to address any identified market failure today. The Committee, therefore, recommended removing these interventions. The Committee noted that the possibility of market failure can be ameliorated, by requiring firms that borrow in foreign currency to hedge their exchange risk exposure. There can be two kinds of hedges: 1) natural hedges; or 2) hedging using financial derivatives. Natural hedges arise when firms sell more tradeables than they consume. This generates the net economic exposure of an exporter. Ownership of real or financial assets abroad also provides firms with some natural hedging, although the liquidity

¹⁰See *Sahoo Committee, Report III*

of those assets will be important for the degree of protection offered. Firms may also use financial derivatives (such as currency futures, currency options, etc.) to hedge their currency exposure.

The Committee made an assessment of the currency risk by Indian firms undertaking ECB. Using data from the Prowess database of Centre for Monitoring Indian Economy, the Committee developed a measure of firms' natural hedge level. For all firms that reported foreign currency borrowing, the annuity payable for those firms at the end of a financial year based on their quantum of borrowing at an average rate of interest was calculated. This imputed liability arising out of ECB was matched with the firms' receivables arising out of their net exports. This gave a measure of the level of a firm's natural hedge. Based on this measure, all foreign borrowing firms were divided into three categories of hedge coverage:

- *High*: Net exports for the year is more than 80% of the annual repayment of ECB for the year.
- *Low*: Net exports for the year is less than 80% but more than 20% of the annual repayment of ECB for the year.
- *None*: Net exports for the year is less than 20% of the annual repayment of ECB for the year.

The analysis by the Committee showed that in 2013 more than 50% of the firms that undertake ECB have small or no foreign currency receivables to naturally hedge the foreign currency liability arising from ECB. Additionally, the value of naturally unhedged borrowing far exceeded the value of naturally hedged borrowing. The quantum of naturally unhedged ECB was 3-4 times the amount of borrowing that are naturally hedged. The analysis by the Committee showed that around 50% of the firms undertaking ECB, which constitute over 70% of the ECB amount borrowed in a year, are in need of financial hedging to cover their risks arising out of foreign currency borrowing.

The main recommendation of the Committee was that Indian firms should be able to borrow abroad through foreign currency debt, while requiring them to substantially hedge their foreign currency exposure, whether through financial derivatives or natural hedges.

The Committee examined the framework in comparable jurisdictions to hedge foreign currency exposure. The Committee noted that recently Bank Indonesia introduced hedging requirement to address the systemic risk concerns emanating from foreign currency borrowing. Their approach is to prescribe

a certain percentage of the negative balance between foreign currency assets and liabilities to be hedged. The percentage applies to all sectors irrespective of the net exchange rate exposure of a sector.

The regulation states: “Non-Bank Corporation holding External Debt in Foreign Currency is required to fulfil a specified minimum Hedging Ratio by Hedging the Foreign Currency against the Rupiah.”¹¹

The minimum Hedging Ratio is set at 25% of:

1. the negative balance between Foreign Currency Assets and Foreign Currency Liabilities with a maturity period of up to 3 (three) months from the end of the quarter; and
2. the negative balance between Foreign Currency Assets and Foreign Currency Liabilities with a maturity period of between 3 (three) and 6 (six) months from the end of the quarter.

Similarly, the Committee observed that the South African exchange control framework prescribes a check list of requirements to enable the authorities to assess the adequacy of hedging. Some of the key requirements prescribed are as follows:

- Are the facilities required to cover a firm’s exposure to possible losses arising from adverse movements in foreign exchange rates?
- Is the transaction clearly identifiable as a hedge?
- Does it reduce the exposure to risk?
- Is there a high correlation between the price of the hedge contract and the underlying asset, liability or commitment (the underlying transaction)?

Based on a review of the current framework and policy directions in comparable jurisdictions, the key recommendations of the Committee can be summarised as follows:

1. The present complex array of controls on foreign currency borrowing should be done away with.
2. Irrespective of the nature and purpose of foreign borrowing, every borrower must hedge a minimum specified percentage of its currency exposure. Such

¹¹In addition to prescribing a minimum hedging ratio, the regulations also prescribe liquidity ratio and credit rating related requirements.

percentage must be uniform across sectors or borrowers.¹²

3. Every firm wishing to borrow abroad must demonstrate hedging of currency exposure either through natural hedge or commitment to hedge through derivatives transactions. This means that a borrower may meet the hedge requirement through natural hedge and/or through currency derivatives.
4. It is necessary to develop the on-shore currency derivatives market. The Government and regulators must make a concerted effort to make the currency derivatives market deep and liquid. This would reduce the cost of hedging and make hedging facilities available to firms.
5. The minimum hedge ratio may be decided by the authorities keeping in view the financing needs of the firms and of the economy, the development of onshore currency derivatives markets and any other systemic concern such as volatility in global risk tolerance. The ratio may be modified by the authorities periodically depending on the exigencies.
6. The board of every borrowing company must be obliged to certify at least once a year that the company fulfils the hedging requirement. In addition, supervision may include powers to inspect books of borrowers to confirm adherence to hedging norms.
7. The Indian domestic rupee debt market is a viable alternative to foreign borrowing for financing Indian firms and does not entail any market failure. The policy should aim at removal of all impediments to the development of the domestic rupee debt market.

In Section 6, we discuss the feasibility, including specific challenges, as well as the desirability of implementing the above recommendations of the Sahoo Committee. However, this is a dynamic area of policy making, and several changes have already been undertaken. These recent policy changes are discussed in Section 5.2.

5.2 Recent policy changes

Recent policy changes in the framework for foreign borrowing in India have moved in the direction of addressing some of the issues raised above. These changes pertain to rupee-denominated borrowing, monitoring and regulating

¹²Nothing in this recommendation obviates policy reforms that might improve corporate governance and best practice in the sphere of risk management. The point of a minimum specific requirement on foreign currency borrowing is that there are specific externalities and systemic risks associated with this source of debt exposure.

direct and indirect unhedged exposures, and foundational reforms in financial sector laws and regulations.

5.2.1 Increasing access to rupee denominated borrowing

Foreign participation in rupee denominated corporate bonds is being gradually liberalised. At present foreign investors are allowed to invest in rupee denominated corporate bonds upto USD 51 billion. Till April 1, 2013, there were sub-limits within the overall cap of USD 51 billion, these have now been merged. Subsequently, the authorities announced a rationalisation of foreign investment in corporate bonds. The ceiling of USD 1 billion for qualified foreign investors (QFIs), USD 25 billion for foreign portfolio investors (FPIs) and USD 25 billion for FPIs in long-term infrastructure bonds, were merged within the overall cap for corporate bonds at USD 51 billion.¹³

Further, the process of allocation of limits to individual entities within the aggregate debt ceiling has been liberalised. A previously used auction mechanism for allocating debt limits to individual firms has been largely replaced by an ‘on-tap system’. The auction mechanism would be initiated only when the aggregate of individual firm borrowings reaches 90 percent of the overall debt limit, for allocation of the remaining 10 percent of possible borrowing to individual firms. These measures aim at simplifying the norms for foreign investment and can play a role in encouraging development of the debt market in India.¹⁴

Increasing access to foreign participation in rupee-denominated bonds avoids the problem of currency mismatch for borrowers who use this alternative. Of course, when foreign investors buy rupee-denominated bonds, they are exposed to fluctuations of inflation and interest rates in India, as well as currency risk. A well-functioning, liquid corporate bond market can reduce transactions costs and make the risk-reward tradeoffs more transparent for all participants, including foreign investors. In turn, increased foreign participation can help to further increase liquidity.

¹³See *RBI Circular on Foreign investment in Government Securities and Corporate Debt*

¹⁴However foreign participation is restricted to rupee denominated corporate bonds having a minimum residual maturity of three years. See *Foreign Investment in India by Foreign Portfolio Investors*

5.2.2 Steps to monitor unhedged currency exposure

The regulator has initiated steps to improve the reporting framework for currency exposure by requiring companies to disclose information on hedging. The format of ECB-2 Return (the form for monthly reporting by ECB firms) has been modified. A new part has been added which requires firms to disclose details of financial hedging contracted if any. The reporting firms are also required to provide details of average annual foreign exchange earnings and expenditure for the last three financial years to RBI.¹⁵ Such reporting enables RBI to monitor unhedged currency exposure of borrowers.

5.2.3 Guidelines on capital and provisioning requirements

In order to discourage banks from providing credit facilities to companies that refrain from adequate hedging against currency risk, the RBI has prescribed guidelines on incremental capital and provisioning requirements for banks with exposures to entities with so-called Unhedged Foreign Currency Exposure (UFCE). RBI has also prescribed the manner in which losses incurred on UFCE should be calculated.¹⁶

The methodology used by RBI has the following key elements:

1. *Ascertain the amount of unhedged foreign currency exposure:* RBI defines Foreign Currency Exposure (FCE) as the gross sum of all items on the balance sheet that have impact on profit and loss account due to movement in foreign exchange rates, where only items maturing or having cash flows over the period of the next five years are considered.

UFCE excludes items which are effective hedge of each other. Financial hedging through derivatives is only considered where the entity at inception of the derivative contract has documented the purpose and the strategy for hedging and assessed its effectiveness as a hedging instrument at periodic intervals. Natural hedges are considered when cash flows arising out of the operations of the company offset the risk arising out of the FCE defined above. For the purpose of computing UFCE, an exposure is considered naturally hedged if the offsetting exposure has the maturity/cash flow within the same accounting year.¹⁷

2. *Estimate the extent of likely loss:* The loss to an entity in case of movement in USD-INR exchange rate is calculated using the annualised volatilities. The largest annual volatility seen in the USD-INR rates during the period of last ten years is taken as the movement of the USD-INR rate in the adverse direction.

¹⁵See RBI *ECB - 2 Form*

¹⁶See RBI *Capital and Provisioning Requirements*

¹⁷See RBI *Capital and Provisioning Requirements*

3. *Estimate the riskiness of unhedged position and provide appropriately:* Once the loss figure is calculated, it is compared with the annual EBID as per the latest quarterly results certified by the statutory auditors. This loss may be computed as a percentage of EBID. EBID is defined: Profit After Tax + Depreciation + Interest on debt + Lease Rentals, if any. As this percentage increases, the susceptibility of the entity to adverse exchange rate movements increases. Up to 15%, there is no incremental provisioning requirement on the total credit exposures over and above extant standard asset provisioning. After 15%, provisioning requirements apply.¹⁸

5.2.4 Initiatives to liberalise issuance of rupee denominated bonds

On September 29, 2015, the RBI allowed Indian corporates eligible to raise ECB to issue rupee denominated bonds within the overarching ECB policy.¹⁹

The salient features of the framework for Indian corporates are:

1. Any corporate or body corporate is eligible to issue Rupee denominated bonds overseas. Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs) coming under the regulatory jurisdiction are also eligible.
2. The bonds may be floated in any jurisdiction that is Financial Action Task Force (FATF) compliant.
3. Only plain vanilla bonds either privately placed or listed in exchanges as per host country regulations are allowed.
4. The bonds will be issued with a minimum maturity of five years.
5. The all-in-cost ceilings will be commensurate with prevailing market conditions.
6. The proceeds can be used for all purposes except for a small negative list including investment in capital market and real estate activities.
7. Upto USD 750 million is allowed under the automatic route, beyond this limit would require regulatory approval.

The effectiveness of this framework remains to be seen. While addressing currency exposure, the rationale for the remaining ECB framework restrictions is not entirely clear. Due to larger currency restrictions, we may not see a larger number of private firms moving from dollar bonds to rupee bonds in the immediate future.

¹⁸See RBI *Capital and Provisioning Requirements*

¹⁹See RBI *Issuance of Rupee denominated bonds overseas*

5.2.5 Addressing the foundations of sound governance

As argued in Section 4.3, the present arrangements have many problems, including concerns about the ill-defined or non-transparent industrial policy; the economic knowledge required to write down detail for practical implementation; the cost of doing business; and the rule of law. Recall that the last characteristic has very precise components, as described in the earlier section. The Financial Sector Legislative Reforms Commission (FSLRC) has drafted a concrete framework for the rule of law in finance in the draft ‘Indian Financial Code’, a unified modern law covering all aspects of Indian finance. The Ministry of Finance has drafted an ‘FSLRC Handbook’ of elements of this framework that are being adopted by regulators as good practices.

Reforms that shift the economic foundations as described above, and emphasise the rule of law by adopting the procedures of the FSLRC *Handbook*, are required in the field of FCB. This would involve the following changes in the regulatory framework of foreign borrowing in India:

1. All draft subordinate legislation governing foreign borrowing would be published with a statement of objectives, the problem it seeks to solve, and a cost-benefit analysis (using best practices).
2. The draft subordinate legislation would be accompanied by a statement of the problem or market failure that the regulator seeks to address through the proposed regulations, which will be used to test the effectiveness with which the regulations address the stated problem.
3. Any proposed change in regulations would be preceded by inviting comments from the public. All comments would be published on the website of the Regulator. The process of soliciting public comments would enhance the legitimacy of regulatory intervention by engaging with stakeholders. It would enable the regulator to seek external views and advice in a cost-effective manner.
4. The Board would approve the final regulations after considering comments from the public, and modifications of the regulation consequent to the comments.
5. All the approved regulations would be published on the website within 24 hours of their coming into force. If all the relevant information were to be published, it would become easier for firms to understand what they are, and are not, allowed to do. As a result, they will be able to operate with clarity and confidence.

6. A key reform would involve requiring the regulator and government to develop a detailed legal process governing approvals. This would imply that all applications for borrowing under the approval route would be accepted or rejected within a specified time. In the event of rejection of an application, reasons for rejection would be provided. This would substantially reduce the discretion that the regulator possesses in the current arrangement. If administrative orders were freely and publicly available, a rich jurisprudence could develop around the process of approvals, bringing legal clarity and predictability to the system.

6 Remaining challenges

The measures elaborated in the previous section are incomplete and, in some cases, transitional responses to the issue of managing aggregate risks associated with foreign currency borrowing by Indian firms. This section presents some remaining issues and challenges relating to foreign borrowing in the context of the current and evolving regulatory and economic reform landscape. As was discussed earlier in the paper, addressing challenges relating to foreign borrowing can also involve broader issues of financial sector reform. In many cases, taking a more comprehensive view of reform can provide potentially more robust policy changes.

6.1 Addressing moral hazard

Moral hazard as a source of currency mismatch, and therefore of risk associated with foreign borrowing, was highlighted in Section 4. The moral hazard for firms engaged in such borrowing arises from exchange rate management. Over recent years, however, the Indian exchange rate regime has evolved substantially, away from an administered rate towards a market determined rate. The Monetary Policy Framework Agreement of 20 February 2015 has enshrined price stability as RBI's objective. This would be consistent with a greater movement towards exchange rate flexibility, since trying to manage the exchange rate can undermine domestic monetary policy control (part of the classic trilemma). To the extent that the rupee is a floating exchange rate, there would be reduced moral hazard; firms would hedge out of their own self-interest.

6.2 Addressing incomplete markets

Incomplete markets for currency hedging were also highlighted in Section 4, as a source of currency mismatch. At present, the Indian currency derivatives market is relatively illiquid and only gives choices to firms for short-term hedging. Furthermore, a substantial part of this market trades at overseas locations, and capital controls prevent Indian firms from accessing this market.

Financial development, in the form of building the “Bond-Currency-Derivatives (BCD) Nexus,” would help create sophisticated markets onshore, through which access to hedging would improve. The term “BCD Nexus” has been used in the Indian context to highlight the interconnectedness of different financial markets. The regulation of markets for corporate and government bonds, foreign currencies, and financial derivatives tied to them, has often been piecemeal, failing to take account of their interconnectedness. In particular, greater liquidity in a subset of these markets can enhance liquidity in other markets, making it optimal to develop different markets together. Of course, the key underlying idea is that such overall financial development is likely to be beneficial from India’s current starting point, in terms of improving opportunities for risk management as well as channelling of funds to productive uses. In addition to this broader reform for financial development, very specific reforms of capital controls would also need to be considered, in order to give Indian firms the choice of using rupee derivatives which trade at overseas locations. In all cases, the overarching goal would be to reduce the costs of hedging by reducing the severe effective incompleteness of financial markets that enable such forms of risk management.

6.3 Measuring exposure and hedging

As discussed in Section 5, the Sahoo Committee report discussed both explicit and natural hedges by firms engaging in foreign currency borrowing, as well as offering some estimates of the then-current extent of natural hedging by such firms. As discussed in Section 5, the RBI announced regulations for banks requiring them to measure and provision for the foreign currency exposure of firms borrowing from them. This section discusses some of the practical challenges in measuring currency exposure and natural hedging levels.

6.3.1 Import parity pricing

In the traditional literature, currency mismatch is seen to arise from mismatches between the stream of net exports, and the stream of payments required owing to debt servicing. A possible refinement in this approach is rooted in the concept of import parity pricing.²⁰ When trade barriers decline, and when the infrastructure of transportation improves, more types of goods and services become tradeable. In the limit, when the value of the goods is large compared with the total transactions costs (including tariffs), arbitrage becomes efficient and the domestic price closely tracks the global price.

In the intuition of arbitrage with financial derivatives, a ‘no-arbitrage band’ is seen around the world price expressed in rupees. If the domestic price rises, and goes outside the no-arbitrage band, rational arbitrageurs will make a profit by importing and selling into the domestic market. If the domestic price drops, and goes outside the no-arbitrage band, rational arbitrageurs will make a profit by exporting. Actions by multiple arbitrageurs will ensure that the domestic price stays within the no-arbitrage band, i.e. the zone where international trade is not profitable, net of transactions costs. Under these conditions, the domestic price is approximately equal to the world price, expressed in rupees. The presence of raw materials or outputs which are priced by such “import parity pricing” has potential implications for currency exposure.

For example, a firm which switches from importing steel to buying imported steel from a domestic dealer does not change anything about its exposure to the world price of steel, expressed in rupees.²¹ An Indian firm may buy or sell steel against a domestic counterparty, but it experiences currency exposure exactly as if it were importing or exporting steel. When import parity pricing holds, product prices fluctuate with the exchange rate. These transactions²² are influenced by the exchange rate, even if the buyer and

²⁰For example, see Patnaik and Shah, 2008, for a discussion of currency exposure and import parity pricing, as well as further references.

²¹Indeed, the same argument applies if the firm switches to buying domestic steel, if the price of domestic steel is fully subject to import parity conditions. In this context, one can see that, just as exchange rate management distorts corporate risk and risk management relative to external shocks, so does domestic administered pricing or price controls for tradeables.

²²Simplifying assumptions have been used in constructing Table 5:

1. The purchase of finished goods is merged into the ‘raw materials purchased’;
2. All energy expenses are merged into ‘other operating expenses’ even though some of this is tradeable.

Table 5 The income and expenditure statement of the typical large Indian non-financial firm (2013-14)

Total revenue	100
Raw materials purchased	57.87
Other operating expenses	27.98
Operating profit	14.15

seller are both domestic firms. The ordinary business activities of such firms involve currency exposure, even if there is no direct export or import.

In order to fix intuition, a stylized version of a representative Indian non-financial firm in 2013- 14 is considered. The key facts from its income and expenditure statement are presented in Table 5. Some firms make tradeables; some firms consume tradeables; some firms buy and sell tradeables. In this illustrative tradeable-firm case, a typical engineering firm, which may buy steel and sell ball bearings, is used for expositional purposes. In this case, the raw materials and the finished goods are priced by import parity pricing.

By the logic of import parity pricing, for all practical purposes, this firm imports Rs. 57.87 and exports 100. Goods arbitrage for ball bearings is feasible; ball bearings are tradeable. Hence, the Indian price of ball bearings is the same as the world price of ball bearings. There is therefore no difference between selling Rs. 100 of ball bearings on the domestic market, and exporting Rs. 100 of ball bearings in terms of the impact of currency fluctuations on the variability of the firm's revenue. Even though other operating expenses may be non-tradeable, and therefore not subject to import parity pricing, operating profit will vary in the same way for the exporter and the firm that sells only domestically.

Such a firm has currency exposure owing to its effective net exports; its exposure is equivalent to a firm that actually exports Rs. 42.13. If the Rupee depreciates by 10%, the total revenue of the firm increases to Rs. 110 and the raw materials cost increases to Rs. 63.66 as a result of import parity pricing. Other operating expenses are non-tradeable and do not change, in partial equilibrium. Hence, the operating profit is Rs. 18.36. This is an increase of Rs. 4.21, i.e. 10% of the net exposure of Rs. 42.13. For all practical purposes, the firm is an exporter with exports of Rs. 42.13.

In practice, most firms buy a mix of tradeable raw materials (e.g. steel) and non-tradeable raw materials (e.g. cement). Similarly most firms sell some mix of tradeable and non-tradeable goods and services. Detailed analysis

would be required to uncover the actual currency exposure; a simple analysis of imports and exports would be inadequate.

6.3.2 Evidence of natural hedging

As described in Section 5, the Sahoo Committee report estimated the degree of natural hedging by Indian firms in the Prowess database, using net exports as the indicator of natural hedging. In this section, a similar exercise is conducted allowing for the risk implications of import parity pricing, in addition to net exports. As discussed earlier, if firms that borrow in foreign currency are hedged (naturally or through derivative markets) and have low leverage, they are individually well-placed to absorb currency shocks and therefore systemic risk is unlikely to arise from this particular source.

As noted earlier in the paper, neither of the above two characteristics (natural hedges and low leverage) is taken into account in the current regulations. Hence, changing the regulatory framework to allow firms that meet these criteria to borrow, where they are currently unable to, has the potential to bring down their cost of capital and improve their competitiveness and performance. In a companion paper (Patnaik, Shah, and Singh, 2014) we found that firms that borrow abroad under existing regulations (all relatively large firms, as noted earlier) do slightly better than firms that do not, in terms of asset growth and sales growth. The measured impacts are not strong, and are partly consistent with substitution of foreign for domestic borrowing rather than increased access to capital. Ultimately, market judgments would determine which additional firms could borrow if allowed to do so, and what the impacts on their performance would be. The central point is that loosening the restrictions on firms with low leverage and natural hedges is unlikely to increase systemic risk in this dimension. The existence of natural hedges also implies that such firms do not have to use derivatives to reduce the currency risk associated with their borrowing abroad.

Table 6 examines the present situation from this point of view. All industries are classified into two groups: tradeables and non-tradeables. In each industry, firms are broken into three groups with low, medium or high leverage. The value shown in each cell is the average share of FCB in the total borrowing of all firms.

The discussion above suggests that large values for FCB should preferably be seen in the ‘Low’ and ‘Medium’ columns for tradeables and nowhere else - assuming, of course, that there is no other characteristic of firms that is

Table 6 Mean FCB to total borrowing by debt-equity ratio

Tradeable sectors			
	Debt Equity		
	Low	Medium	High
Chemicals	0.17	0.36	0.25
Consumer goods	0.31	0.11	0.01
IT services	0.12	0.26	0.22
Machinery	0.15	0.06	0.04
Metal products	0.00	0.17	0.15
Minerals	0.59	0.01	0.15
Textiles	0.05	0.05	0.07
Transport equipment	0.14	0.16	0.09
Median	0.15	0.13	0.12

Non-tradeable sectors			
	Debt Equity		
	Low	Medium	High
Communication services	0.00	0.32	0.11
Construction materials	0.47	0.12	0.01
Electricity distribution	0.00	0.18	0.06
Electricity generation	0.30	0.10	0.01
Food and agriculture	0.26	0.09	0.05
Hotel tourism	0.00	0.12	0.17
Infrastructure construction	0.00	0.14	0.05
Real estate	0.00	0.03	0.00
Transport services	0.19	0.21	0.14
Wholesale-retail trading	0.10	0.12	0.01
Median	0.05	0.12	0.05

positively correlated with being non-tradeable or having high leverage which also makes such firms more attractive borrowers (e.g., superior management). Large values for FCB, relative to industry averages, are found in many cells for non-tradeable firms. Hence, the evidence suggests that ECB is currently not dominated by firms who are exporters, or those with the currency exposure of exporters. Following this logic would therefore suggest reforms of capital controls, whereby:

1. The exposure of the firm is computed correctly, after taking into account import parity pricing; and
2. Firms which do not have natural hedges must use currency derivatives for some minimum level of hedging.²³

Recent policy approach to hedging has begun to incorporate considerations of the degree of natural hedging, for example, the language of the RBI's guidelines to banks for assessing the UFCE of their borrowers speaks of fluctuations of cash flows in general terms, potentially encompassing those due to exporting as well as import parity pricing. Nevertheless, how to measure natural hedging and how to set a minimum level of explicit hedging for firms without natural hedges are complex issues, and some of the challenges are discussed in the next sub-section.

6.3.3 Challenges in assessing currency exposure and hedging

There are several practical challenges in developing a policy framework that incorporates measures of natural hedging as well as overall risk management of firms, as an input into risk management standards such as minimum hedging requirements for currency risk. Since tradeable and non-tradeable components of a firm's revenues and expenditures cannot be observed directly from income statements and balance sheets, and the degree to which input and output prices satisfy import pricing parity can also be difficult to determine in practice, regulations with respect to hedging standards would not be easy to implement in an optimal manner. The RBI regulations for banks represent one attempt to tackle the practical challenges.

In another conceptual approach, Patnaik and Shah, 2010 use stock prices

²³A minor caveat is that inferring the normative direction of improvement in the distribution of FCB from the current situation where large FCB firms do not have natural hedges assumes that these firms are not otherwise hedged, and that they do not have other characteristics that make them systematically 'better' borrowers. Both these assumptions seem reasonable from our knowledge of the overall situation of the FCB firms.

to infer currency exposures, by estimating the response of stock prices to changes in the exchange rate. They examine various models, including first estimating unanticipated changes in the exchange rate, and then estimating the lagged response of stock prices over time to these unanticipated changes. This method of measuring currency exposure of firms is feasible, but it may not be sufficiently simple and robust to serve as a reliable and practical policy tool.

The practical issues with respect to estimating firms' currency exposure are even more complex than the Patnaik and Shah, 2010 analysis allows for. Their procedure uses the Rupee-US Dollar exchange rate, but the relevant trade-weighted exchange rate might differ across different firms, depending on their patterns of production and sales. In the RBI guidelines, a simplified approach is used, wherein the riskiness of UFCE for non USD currencies is to be ascertained by converting them to USD using current market rates, but this may not be an accurate method of assessing true currency risks. Furthermore, firms' currency risk is only a part of their overall risks, and is not likely to be independent of other risks. For example, currency risk for firms that borrow abroad contributes to overall default risk, and appropriate risk management standards should also focus on the latter and not just the former.²⁴

On the one hand, therefore, one can argue that prescribing hedging, measuring exposure, and monitoring the extent of hedged exposure at the individual firm level are very challenging tasks for a central regulator. Ideally, these tasks are best left to the firm that undertakes hedging as a business decision, provided corporate governance and overall risk management standards are themselves adequate. Certainly, there is a role for regulatory standards in those broader contexts. A second line of defence is monitoring by lenders, who will be concerned about their own bottom lines. One could take the policy approach that lenders will do appropriate due diligence, so if a firm has lined up access to FCB, its default risks and its risk management efforts have already been assessed and passed muster.

However, as the global financial crisis revealed, market judgments on individual firm risks are not sufficient to ensure optimal management of systemic risks. The problem of overall mitigation of systemic risks is a complicated one, and beyond the scope of this paper. Here we merely suggest that, for

²⁴For example, Marc Goedhart and Rehm, 2015 have provided a lucid discussion of some of the complexities of management of currency risks, including some basic references to the literature on corporate risk management, and a discussion of different types of risks (portfolio, structural and transactions).

the specific case of currency mismatch associated with foreign currency borrowing by individual firms, greater currency flexibility and large and liquid currency derivative markets, as discussed in Sections 6.1 and 6.2, offer a cleaner and more sustainable long-term solution. Under these broader policy conditions, the chance of systemic risk arising from a large number of large firms undertaking unhedged currency exposure is likely to be low. This view does not contradict the position that a minimum hedging requirement can be a useful transitional policy measure, nor the importance of measuring and mitigating potential systemic risks in an overall macroprudential policy framework.

7 Conclusion

In the early years of international financial integration, the simple idea dominating the discourse was that of a ‘hierarchy of capital flows’. It was felt that equity flows are good while debt flows are not good.

From the late 1990s onwards, this idea has been replaced by a more nuanced one that is grounded in an understanding of the anatomy of market failure. The market failure (i.e. externalities) associated with foreign borrowing requires a combination of three things: (a) a pegged exchange rate; (b) currency exposure in the hands of firms who do not have commensurate equity capital to absorb shocks; and (c) a large fraction of the overall corporate sector is made up of these firms.

In order to navigate the policy issues of this field, it is useful to have a normative objective. A sound resource allocation is one where foreign currency borrowing is done by firms with the currency exposure of exporters (even if they do not engage in direct exports), and are able to leave such borrowing unhedged, as it counterbalances their natural hedges. In this allocation, foreign currency borrowing becomes a remarkable low cost source of funds. A sound policy framework is one which succeeds in giving certain firms this low cost access to capital, while avoiding systemic risk.

At present in India, the resource allocation does not match up to this normative ideal. A substantial fraction of ECB is taking place in companies who do not have natural hedges. Shifting the resource allocation towards the normative ideal will require significant reforms of the capital controls, and the monetary policy framework. With present capital controls, there are concerns on questions of rule of law and sound public administration.

These need to be addressed by, bringing them up to the processes defined by FSLRC.

There is fresh interest in the international discourse in capital controls. This paper thoroughly documents the restrictions, and their outcomes, for one asset class (foreign currency debt) in one country (India). This paper has shown that there is a large gap between the complexities and the problems of capital controls, in the real world, when compared with an abstract concept of capital controls which is sometimes being advocated in the international discourse.

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