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Foreign Currency Borrowing by Indian Firms: Toward a New Policy Framework§

ABSTRACT 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 the gross domestic product. We identify policy directions to help address these concerns.

Keywords: *Capital Controls, External Debt, Market Failure*

JEL Classification: *F3, G1, D6*

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

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borrowing (FCB) has grown sevenfold, 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 FCB because governments and central banks communicate their intent to manage the exchange rate when faced with large depreciations. Concerns about unhedged FCB 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 FCB under pegged exchange rates. The puzzle lies in designing a capital control system that interferes with unhedged FCB but not with foreign borrowing by firms with hedges. For firms which have natural hedges, unhedged FCB 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 FCB, while avoiding it? 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 control regime. The Indian strategy for capital controls on FCB presently involves many kinds of restrictions. The dominant form of currency borrowing is “External Commercial Borrowing” (ECB) by companies.¹ Rules 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.

1. The term ECB has a specific meaning in the context of Indian regulations on borrowing from abroad, and is different from the term “foreign currency borrowing” in several respects. The differences will be made clear later in the paper.

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 (FCE) 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 FCB 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 FCE.

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 FCB.

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 motivated 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 FCB by firms in countries with pegged exchange rates. The careful examination of the Indian capital controls on FCB suggests that the Indian framework has not been effective in permitting safe activities while reducing systemic risk.

2. The 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 FCB. 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 3 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."

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.

2. Both 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.

3. See Reserve Bank of India (2015b).

Table 1 summarizes 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 tracks. As an example, overseas branches/subsidiaries of Indian banks are allowed to lend under Track I but not under Track II and Track III.⁴

TABLE 1. Regulatory Sub-categories for ECB and Trade Credits

<i>Sub-category</i>	<i>ECB*</i>	<i>Trade credits automatic route</i>
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

Source: RBI: Master Circular on ECBs and Trade Credits, July 2014.

Note: * Loans up to a certain ceiling can be automatically approved but need approval thereafter.

4. Obviously, 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.

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 3–5 years (Track I). The cost ceiling is 500 basis points over six-month LIBOR for tenor of more than 10 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 liberalized framework with a negative list of purposes for which ECB access is not allowed. Track III offers a marginally liberalized 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 utilization. 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.
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 authorized dealer bank with their proposal along with a duly filled form. The authorized 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 the authorized dealer bank. Such cases are considered by an empowered committee set up by RBI.
12. *Hedging requirements implemented through banking regulation*: On January 15, 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 FCE*. 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.

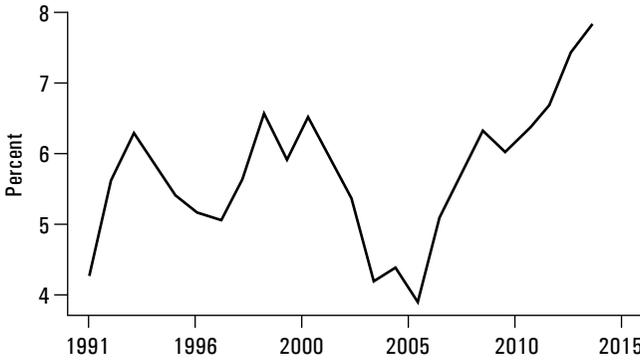
3.1. Time Series Aggregates

Figure 1 shows the ratio of outstanding ECB to gross domestic product (GDP).⁵ ECB as a ratio of GDP stood at 7.9 percent at the end of 2013–14. There is some year-to-year variability in this ratio, but we do not wish to

5. ECB data has been sourced from *India's External Debt: A Status Report*, which is released by the Ministry of Finance (Department of Economic Affairs 2014).

FIGURE 1. External Commercial Borrowing as percent of GDP

Mar 2014; 7.88



Source: *India's External Debt: A Status Report* (Various editions, Department of Economic Affairs 2014), and National Income Account statistics.

speculate as to the causes, and there are not enough years of data to claim any trend.

3.2. Firm-level Borrowing

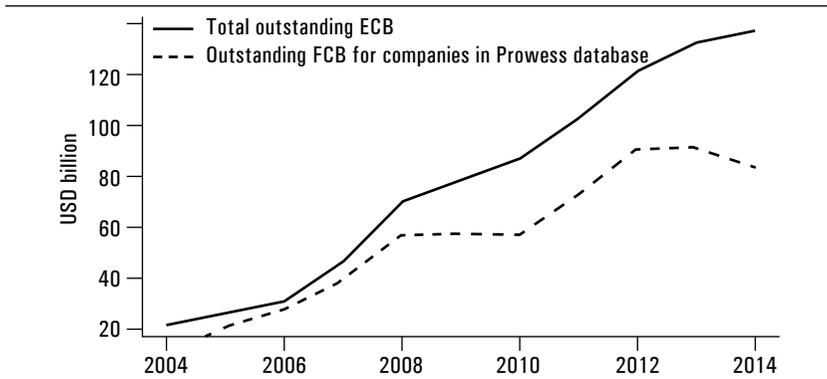
We now describe FCB using firm-level data, drawing upon the CMIE database. We focus on non-financial firms only, in order to avoid non-comparability of accounting information between financial firms and non-financial firms. ECB is not directly visible in the data. We observe FCB, which measures debt 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

6. The 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, ECB, suppliers/buyers credit, global depository receipts, and American depository receipts.

7. A 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 Prowess Firm-level Foreign Currency Borrowing Versus Total External Commercial Borrowing



Source: *India's External Debt: A Status Report* (Various editions, Department of Economic Affairs, 2014) and CMIE Prowess.

ECB from trade credit. We examine the period from 2004 to 2015, which yields a dataset consisting of 127,963 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 dataset captures a significant portion of the country's foreign borrowing.

Table 2 shows summary statistics at one point in time—the 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 ₹5518.50 million, while the median size of firms without foreign borrowing is measured as ₹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 suggest that foreign investors are likely to favor 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 internationalization measures, namely exporting, importing, and foreign institutional investment. Firms that borrow abroad are much more internationalized, by all three measures. Half of the non-FCB

TABLE 2. Descriptive Statistics for Firms with and without Foreign Currency Borrowing in Companies in Prowess Database, 2011–12

<i>Variable *</i>	<i>Category</i>	<i>Mean</i>	<i>SD</i>	<i>Min</i>	<i>25th</i>	<i>Median</i>	<i>75th</i>	<i>Max</i>	<i>Observed</i>
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	132238.00	9962
FII holding (%)	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 (%)	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 (%)	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-to-equity ratio	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 ratio	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 (%)	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

Source: CMIE Prowess

* 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. *Export 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 Profit before Tax and Depreciation (PBDITA) to the interest expenses of a company. *Total trade to sales* is the sum of exports and imports as a percentage of total sales.

firms have zero exports, while the median value of exports for FCB firms is 6.86 percent of sales. The median value for imports as a percentage of sales is 7.93 percent for FCB firms, and negligible for non-FCB firms. In terms of foreign institutional investment, the median value for FCB firms is 4.87 percent, while the median value for non-FCB firms is 2.69 percent.

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 summarize, evidence suggests that FCB firms are much larger than non-FCB firms,⁹ have more debt financing, are more internationalized, and were 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 the 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 internationalization for the median FCB firm—FII holdings and total trade-to-sales—also change substantially in the first part of this period.

8. Debt 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.

9. The 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 the total FCB in the sample.

TABLE 3. Trend in FCB Firms Versus Non-FCB Firms

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

Source: CMIE Prowess.

Note: The table reports the median values for each variable in 2004, 2008, and 2012. The numbers in the brackets represent the inter-quartile range.

4. Areas of Concern

In this section, we describe the areas of concern associated with FCB 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 emphasized the problems of currency mismatch deriving from the “original sin” of borrowing in foreign currency (Aghion et al. 2001; Céspedes et al. 2002; Jeanne 2002; Krugman 1999; Razin and Sadka 2001). Isolated mistakes in commercial judgment 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 effects 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 emphasizes 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 FCB, 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 FCE is just an ordinary business risk that some firms bear.

For example, if 20 percent of firms (by balance sheet size) stand to lose 20 percent of their equity capital in the event of a large and sudden 20 percent depreciation, there is little cause for concern. If, however, 50 percent of the firms (by balance sheet size) stand to lose 50 percent of their equity capital in the event of a sudden 20 percent 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 FCB 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 et al. 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 optimization 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 ± 5 percent, to express the view that the government will not permit the

exchange rate to change by more than 5 percent. 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 mobilize 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 favor of a market-determined exchange rate.

4.1.2. MISMATCH OWING TO INCOMPLETE MARKETS

An alternative hypothesis emphasizes 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 the 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 4, 2014, the hedge ratio for ECBs and foreign

currency convertible bonds came down from 35 percent in 2013–14 to just 15 percent 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 FCEs 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. Table 4 shows that India's exchange rate regime went through structural change, with low flexibility (January 4, 1993–February 17, 1995); followed by high flexibility (February 17, 1995–August 21, 1998); followed by low flexibility

TABLE 4. The Four Periods of Varying Exchange Rate Flexibility

<i>Dates</i>	<i>INR/USD weekly vol.</i>	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

Source: Patnaik and Shah (2010).

(August 21, 1998–March 19, 2004); followed by high flexibility (March 19, 2004–March 31, 2008). This offers an opportunity to examine changes in the currency 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 to changes in the exchange rate is measured, the paper finds that in Period 1, starting from April 1, 1993 to February 17, 1995, where currency flexibility was limited, the exposure of firms was considerable. In Period 2 from February 17, 1995 to August 21, 1998, where high currency volatility was observed, the exposure of firms fell dramatically. In Period 3, starting from August 21, 1998 to March 19, 2004, where currency flexibility again dropped, the exposure of firms rose. Finally, in Period 4, starting from March 19, 2004 to March 31, 2008, where greater currency volatility came about, the currency risk dropped sharply (see third column of Table 4).

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 it 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 favors certain industries over others, without a clear and explicit economic rationale, it constitutes an ill-defined industrial policy. As an example, foreign borrowing is allowed for working capital requirements for the 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 in the form of detailed regulation 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: (a) the law should be comprehensible and known to all citizens; (b) identically placed persons should be treated equally; (c) outcomes of prospective transactions should be predictable to practitioners; (d) there should be no arbitrary discretion in the hands of officials; (e) reasoned orders should be given out for all actions; and (f) the orders should be subject to efficacious appeal. There is currently work underway to improve the financial sector regulation on all these areas through the implementation of the Financial Sector Legislative Reforms Commission (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 FCB. 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 the 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 focused on rationalizing the framework for FCB 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 FCB, 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 GDP. 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 FCB. 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. It 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: (a) natural hedges, or (b) 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 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 the Centre for Monitoring Indian Economy, the Committee developed a measure of firms' natural hedge level. For all firms that reported FCB, the annuity payable at the end of a financial year based on their quantum of borrowing at an

10. See *Sahoo Committee, Report III*.

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

The analysis by the Committee showed that in 2013 more than 50 percent of the firms that undertook ECB had 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 borrowings that are naturally hedged. The analysis by the Committee showed that around 50 percent of the firms undertaking ECB, which constitute over 70 percent of the ECB amount borrowed in a year, are in need of financial hedging to cover their risks arising out of FCB.

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 FCE, whether through financial derivatives or natural hedges.

The Committee examined the framework in comparable jurisdictions to hedge FCE. The Committee noted that recently Bank Indonesia introduced hedging requirement to address the systemic risk concerns emanating from FCB. 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

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

The minimum hedging ratio is set at 25 percent of:

1. The negative balance between foreign currency assets and foreign currency liabilities with a maturity period of up to 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 three and six months from the end of the quarter.

Similarly, the Committee observed that the South African exchange control framework prescribes a checklist 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 summarized as follows:

1. The present complex array of controls on FCB 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 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

12. Nothing 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 FCB is that there are specific externalities and systemic risks associated with this source of debt exposure.

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 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 liberalized. At present, foreign investors are allowed to invest in rupee-denominated corporate bonds up to 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 rationalization 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 liberalized. 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.

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

13. See RBI (2013).

14. However, foreign participation is restricted to rupee-denominated corporate bonds having a minimum residual maturity of three years. See Reserve Bank of India (2015c).

15. See RBI (2014a).

for banks with exposures to entities with the 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 FCE*: RBI defines 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 the 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 annualized 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.
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 as: 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 percent, there is no incremental provisioning requirement on the total credit exposures over and above extant standard asset provisioning. After 15 percent, provisioning requirements apply.¹⁸

16. See RBI (2014b).

17. Ibid.

18. Ibid.

5.2.4. INITIATIVES TO LIBERALIZE 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. REITs and 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 5 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. Up to USD 750 million is allowed under the automatic route; beyond this limit, regulatory approval would be required.

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.

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 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.

19. See RBI (2015a; 2015b).

Reforms that shift the economic foundations as described above and emphasize 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 FCB 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 Hazards

The issue of 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 February 20, 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 channeling 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 FCB, 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 FCE 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

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

arbitrageurs will make a profit by exporting. Actions by multiple arbitrageurs will ensure that the domestic price stays within the no-arbitrage band, that is, 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 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.

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

Source: An illustration.

21. Indeed, 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.

22. Simplifying 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 these are tradeable.

By the logic of import parity pricing, for all practical purposes, this firm imports ₹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 ₹100 of ball bearings on the domestic market and exporting ₹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 ₹42.13. If the rupee depreciates by 10 percent, the total revenue of the firm increases to ₹110 and the raw materials cost increases to ₹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 ₹18.36. This is an increase of ₹4.21, that is, 10 percent of the net exposure of ₹42.13. For all practical purposes, the firm is an exporter with exports of ₹42.13.

In practice, most firms buy a mix of tradeable raw materials (for example, steel) and non-tradeable raw materials (for example, 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 et al. 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 the 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

TABLE 6. Mean FCB to Total Borrowing by Debt–Equity Ratio

<i>Tradeable sectors</i>			
	<i>Debt Equity</i>		
	<i>Low</i>	<i>Medium</i>	<i>High</i>
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
<i>Non-tradeable sectors</i>			
	<i>Debt Equity</i>		
	<i>Low</i>	<i>Medium</i>	<i>High</i>
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

Source: CMIE Prowess.

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 positively correlated with being non-tradeable or having high leverage which also makes such firms more attractive borrowers (for example, 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

23. A 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.

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 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 what 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 the 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 defense 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.

24. For example, Goedhart et al. (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.

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 the specific case of currency mismatch associated with FCB 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 does it contradict 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 (that is, 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 FCB 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, FCB 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 which 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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Comments and Discussion*

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and NBER*

I enjoyed reading this thought-provoking paper. Two of the authors (Patnaik and Shah) played a key role in drafting the Sahoo Committee Report, which pushed for a major liberalization of the complex framework that governs Indian corporations' foreign debt transactions. The report emphasized that the prevailing restrictions on borrowers/lenders, maturity, ceilings, etc., perhaps timely when promulgated, are anachronistic in the current context.

This paper succinctly parses the Sahoo report and explores the market failures arising from corporations in an emerging economy, issuing foreign currency-denominated debt under the restrictive environment of administered currency rates and incomplete markets. I want to use this forum to explore some of the issues raised in the paper.

Figures 1 and 2 given below show the evolution of the Indian and US financial sectors post-1990 relative to GDP.¹ A striking difference is that while the magnitude of the corporate bond market in the USA is approximately equal to the stock market, the corporate bond market in India is insignificant. Figure 3 is a magnified plot of the miniscule corporate bond market in India, which at its peak was about 5 percent of GDP. What I find puzzling is Figure 1 titled "External Corporate Borrowing as a percent of GDP, 1991–2014" in the paper, which quantifies "external corporate borrowing"² at 7 percent of GDP. It suggests that external borrowing by Indian firms exceeds domestic borrowing!

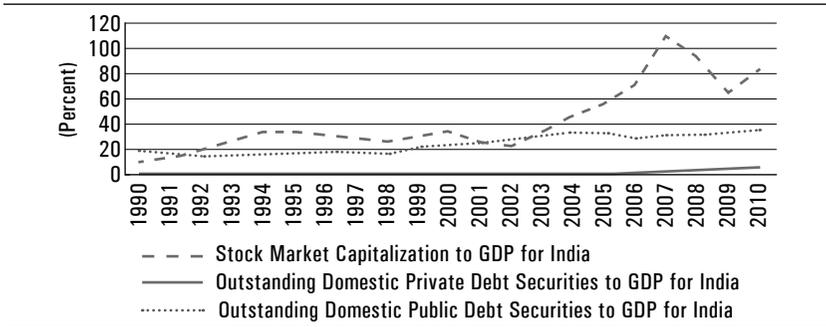
* To preserve the sense of the discussions at the IPF, these discussants' comments reflect the views expressed at the IPF and do not take into account revisions to the original conference paper in response to these and other comments, even though the IPF Volume itself contains the revised paper. The original conference version of the paper is available on www.ncaer.org.

[†] I thank Jamal Mecklai for insightful comments. I am grateful to the participants at the India Policy Forum 2015 for a stimulating discussion.

1. In 2014, India's GDP was approximately US\$ 2 trillion. The US GDP was an order of magnitude more.

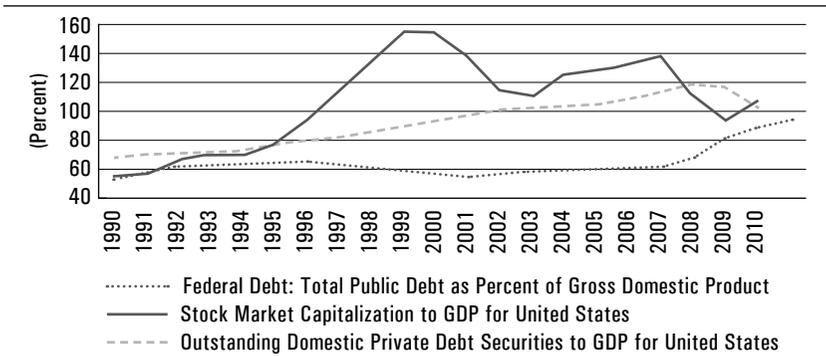
2. External corporate borrowing is the sum of foreign currency borrowing and trade credit.

FIGURE 1. Evolution of the Financial Sector in India: 1990-2011



Source: 2015 research.stlouisfed.org.

FIGURE 2. Evolution of the Financial Sector in the USA: 1990-2011

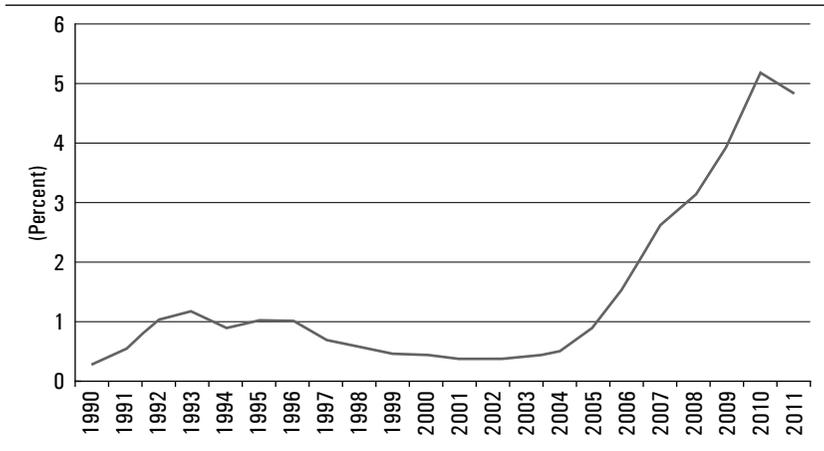


Source: 2015 research.stlouisfed.org.

Private Benefits vs Social Costs

Trade reforms gave Indian firms the ability to compete globally in both factor and product markets. Why not give Indian firms the ability to compete globally for financial capital? This will probably lower the cost of capital, increase investment, and consequently growth. This question cannot be answered in the abstract.

When a firm borrows in a foreign currency, its balance sheet is exposed to exchange rate fluctuations. The optimal response of a value-maximizing firm to this additional source of risk will depend on its perception of how the government will respond to exchange rate movements. The current

FIGURE 3. The Corporate Debt Market in India: 1990–2011

Source: 2015 research.stlouisfed.org.

government policy is an “implicit put,” limiting exchange rate movements to a narrow ± 5 percent range. This creates an incentive for individual firms to under-hedge their foreign exchange (FX) exposure. If numerous firms borrow internationally and do not optimally hedge their currency exposure, the probability of a correlated default increases in the presence of a large exchange rate movement. Idiosyncratic risk at the firm level manifests as an economy-wide systematic risk. The consequent negative externalities constitute a market failure.

A Suboptimal Response

Hedging FX risk is a component of the overall risk management strategy of a firm. A policy of forcing each firm to fully hedge its exposure is clearly suboptimal. It is isomorphic to costly domestic borrowing. More importantly, as is illustrated in the paper of Patnaik, Shah, and Singh, it does not take into account the FX exposure of an individual firm. A highlight of the paper is an example that shows that a domestic firm—the authors quote the case of an Airline Company—may have implicit FX exposure if import parity pricing holds in factor and product markets. Thus, unhedged international borrowing may actually reduce initial product risk for such a firm, without increasing the risk of contagion.

A Solution?

The authors, echoing the Sahoo Committee Report, propose scrapping the current archaic regulations in favor of a more nuanced, case-by-case approach. Firms would still be required to hedge a part of their currency exposure, net of any implicit hedges in place. The information requirements associated with implementing their proposals are nontrivial. An alternative would be to go beyond the Sahoo Committee recommendations and take steps to eliminate the source of the moral hazard. This will go a long way toward addressing India's fundamental need to access capital at competitive rates.

In April 2015, RBI Governor Raghuram Rajan commented, "We hope to get full capital account convertibility in a short number of years." Full capital account convertibility cannot be wished into being. The first essential step would involve reviving and rejuvenating India's moribund FX market.

In 2007, according to a Mecklai Financial study, the Indian FX market was one of the most liquid markets in the emerging markets. It ranked third out of 15 markets studied.

By 2013, the onshore Over-the-Counter (OTC) USD/INR liquidity had shrunk, relative to trade, by over 50 percent. In absolute terms, while global FX market liquidity increased by around 50 percent, onshore USD/INR trading volumes declined by 12.5 percent. In the global FX market, non-bank financial institutions (NBFCs; mutual funds, hedge funds, insurance companies, primary dealers) generate nearly 52 percent of the market volume. In contrast, in the Indian USD/INR market, non-bank entities make up just 26 percent of the market volume.

As a first step toward increasing liquidity and capital account convertibility, the RBI should permit NBFCs to access the domestic USD/INR market, even if they do not have any underlying FX exposures. This would add about US\$ 10 billion to daily turnover, introduce a diversity of players and views, incentivize information-gathering, and lay the foundations for trading transparency and market efficiency. The consequent increase in average volatility would, in turn, motivate firms to endogenously adapt by increasing their hedge ratios to optimally hedge risk.

Concluding Comments

Over the past decade, India's external trade has doubled. However, FX transactions have not kept pace. This is largely because of the absence of non-bank transactions, which typically constitute 50 percent of all FX transactions. This paper is a well-articulated, timely reminder of much-needed reform in this area.

Tarun Ramadorai*Oxford University*

Thanks to NCAER for inviting me to discuss this paper. This is yet another thought-provoking paper by Ajay, Ila, and Nirvikar. Looking at the difference between Ila's presentation and the paper as written, I had a sense of cognitive dissonance—her presentation had issues that Ila would probably have liked to have communicated in the paper, but did not.

Let me begin with a quick overview. Foreign currency borrowing has increased hugely, doubling over the last decade to around 8 percent of GDP). Whether or not you think that the “level” is correct, there has been a dramatic “increase” over the past 10 years or so. As usual, given our regulatory environment, there are labyrinthine regulations surrounding who, how, when, how much, from whom, and why it can be borrowed. The authors waded into this complicated issue and, as far as I can see, make three policy prescriptions which seem to roughly correspond to the prescriptions of the Sahoo Committee Report.

First, they recommend doing away with the complex array of controls on foreign currency borrowing in dollars or rupees, once hedging is in place. This is important—note that this applies “once hedging is in place”. Second, they recommend eliminating the cap on rupee-denominated borrowing, which is currently lower than the cap on dollar-denominated borrowing. This is because of a design issue—one is a cap on flows, while the other is a cap on the stock of borrowing. This current design does not really make a lot of sense, so it is difficult to disagree with the authors' prescription in this case. Third, and in some sense most controversial part of the Sahoo Committee Report and the authors' prescription, is to compute firm exposure to foreign currency risk and “enforce” hedging by firms.

I will concentrate my discussion on this third prescription, which seems problematic to me for a number of reasons. Let me begin by highlighting some simple logistical complexities before getting into the deeper incentive issues: first, it is clearly difficult to compute exposure correctly; second, we have to decide that some firms are naturally hedged because they have exports offsetting their imports; and third, we have to enforce their putting a synthetic hedge in place. These complications ensure that intrusive inspections and bureaucracy will need to be put in place to enforce this prescription. However, in my view, which I believe Rajnish Mehra shares, this is the least of the worries about this prescription. Enforcing hedging just does not make sense for many other more important reasons, which I will now turn to describing.

One way to begin this discussion is to turn to some of the specifics of the paper. The authors observe in the data that firms' hedging intensity is correlated with foreign exchange rate volatility. This, according to the authors, is evidence that firms have an implicit put option to the government and suggests that there is a moral hazard problem. Let me explain this. The authors' argument is that if firms believe that the government is going to manage the exchange rate when the going gets rough, that is, that there is an implicit cap on the exchange rate when it moves ± 5 percent, then firms have a tendency to act as if they have a free ride within those bounds—they can simply forget about hedging at low levels of volatility, since they expect that the government is going to come in and save their bacon if things get any worse on the volatility front. As a result, the authors prescribe mandatory hedging by firms to eliminate this perceived moral hazard problem.

My first issue is that the evidence simply does not support such a proposal. Why? Well, the problem with any empirical analysis of this nature is that it is observationally equivalent with another explanation, which is far simpler—meaning that Occam's razor would lead you to believe it more than the complicated moral hazard alternative. The alternative explanation is that if exchange rate volatility goes up (and we know that volatility is highly persistent), then it changes firms' expectations about future volatility, creating incentives to hedge, and so observed hedging rises. If exchange rate volatility is lower, then firms do not perceive that they need to hedge, ergo they do not hedge and observed hedging falls. According to this simpler explanation, perhaps there is no market failure at all—moral hazard is just illusory, in the absence of more credible identification. My conclusion is that we cannot really say much more about which explanation is true, and we are back to Occam's razor. We can certainly point out that theoretically the implicit put exists, which may lead to some moral hazard issues. But I do not think that we can really prove anything when we look at the data and correlate hedging activity with volatility. My reading of the facts is that firms appear to respond appropriately to the signals that are offered to them by the market.

To my mind, there is another moral hazard here, which is bigger, and which we are completely ignoring in this conversation—this is the question of whether bailouts are available from state-owned banks if things go wrong. That to my mind is one big problem with the Indian banking sector—every time something goes wrong for firms, it looks like domestic banks are willing to step in and provide credit to put it right. That is an important implicit put that exists in the Indian system today—it does not matter if you are truly creditworthy, because if you beg hard enough and apply political pressure,

then someone in the state system is going to give you a loan. This is a problem that RBI is fixing, thankfully, and while this is not the problem being referred to in this paper, it is certainly lurking in the background. It might be worthwhile for the authors to see if they can find evidence that foreign exchange losses are “hedged” by cheap credit from the banking system. That would certainly constitute a smoking gun if the authors were looking for one.

Another point the authors make is that they observe that there are not many long-dated derivatives contracts. They suggest that a market may be missing where firms can hedge long term. I should point out a few things in this context. First, the fact that some exchange rate exposures are from very long-term contracts means that firms might not even need the hedge. If purchasing power parity (PPP) holds (we know from plenty of work that the half-life of PPP deviations is about three and a half to five years), then the optimal hedge is not to hedge since real exchange rates are mean-reverting. You just need to wait long enough, and eventually everything is going to be fine. Perhaps firms are not hedging long term because of their long-duration loans or contracts, meaning that it does not make a difference at the end of the day whether they hedge or not. In particular, if transactions costs are high enough, why bother to hedge? It seems to me that the problem lies not in long-term borrowing but in short-term borrowing when PPP does not hold. That is to say, trade credit may well be the issue rather than long-term external commercial borrowing.

In any case, “constraining” firms to hedge is a very inefficient solution, even if you do believe that there is a market failure constraining firms from hedging. An aside—I feel that in India, we have a sense of embarrassment about eliminating regulations. Every time we remove a regulation, we feel the need to add another in its place because we feel a sense of emptiness if we do not have a maze of regulations confronting us! More seriously, if we impose the constraint that firms “must” hedge, then think about the resulting equilibrium.

On one hand, we would have imposed hedging pressure on the market through this constraint. On the other hand, we generally frown upon speculators entering the market. We now have a one-sided market, where we have created enforced hedging demand, with no one on the other side to satisfy it. Let us recall what a hedging contract is—if I take a short position in a currency to hedge a long exposure, then someone has got to step in and provide me with this trade, that is, take the long position on the other side. Who is that entity? Generally, we require speculative capital on the other side. Firms that will be required to hedge generally have very similar hedging requirements (more importantly, on aggregate, we know that there is a

trade imbalance on one side of the market or the other). The net result, if speculative capital is not available to step in and fulfill this created need, is severe price pressure on the exchange rate. This, in turn, will create unnatural appreciation or depreciation and artificial exchange rate volatility, since the price mechanism is the only way to achieve equilibrium to clear the hedging market.

This is the classic Keynesian hedging pressure theory of exchange rates—and I suspect that it applies well in this case, meaning that such a policy will simply create additional volatility in the exchange rate. This issue highlights a concern with many of our policies—we tend to think in partial equilibrium, while the world lives in general equilibrium.

Of course, the other problem with the policy prescription of mandatory hedging is that if we push firms to hedge, then there is a potential Frankenstein scenario out there. If we force firms to develop technologies to hedge complex financial derivatives contracts rather than stick to their knitting, then we could end up creating another Enron or Metallgesellschaft, that is, firms that got into hedging, and seemingly stopped doing what they were really good at, to their eventual destruction. I would propose that we do not want firms to develop a capability to engage in financial engineering if they do not already see the need to develop it without a regulatory push.

Let us go back to India's Byzantine regulations for a moment. I would like to commend the authors, who have really been on the frontlines of wanting to scrap regulations and have been at the forefront of the effort to write bright-line laws to eliminate ambiguity. This is much needed, and I fully subscribe to their point of view. While regulations are wonderful for applied economists because they provide lots of identification, and I would personally be quite sad to see them go because it reduces my opportunities to produce research, they are pretty much everyone else's nightmare. So, I fully support the authors' desire to reduce the system of regulations surrounding this issue. However, in the same spirit, I do not believe that the answer is an intrusive system of mandatory hedging. I would propose that the authors explore an intermediate solution—perhaps a disclosure-based solution. In many countries, accounting standards require you to disclose your extent of hedging. My own research using the US data on this issue suggests that firms do not really treat this exercise with the care it might warrant, but, at the very least, one is able to get a sense of what firms are doing. This is helpful—if the information is out there, then it can be used by market participants to assess firms' risk as a result of hedging (or eschewing hedges). If this risk is indeed systematic, then the expected return on

firms subject to this risk on account of their hedging policies will change to reflect this in a well-functioning equity market such as we have in India.

I would now like to turn to another issue that the authors highlight in this paper. They point out that foreign currency borrowing stood at US\$ 171 billion at end-December 2014, and that rupee borrowing from foreign lenders is capped at US\$ 51 billion. I fully agree with the authors that this seems problematic. Short-term foreign currency-denominated borrowing has been highlighted as a form of “bad cholesterol” ever since the time of the Asian crisis. However, with rupee borrowing from foreign institutions, there is one issue that I would like to highlight. We know that there is a parent–subsidiary structure issue here. In particular, foreign parent institutions fund their local subsidiaries to engage in rupee lending. The issue that this raises is whether the parent has the ability to call these rupee loans of the subsidiaries in response to currency fluctuations that they face overseas. If this is the case, then rupee borrowing from foreign institutions is equivalent to foreign currency borrowing, so we are back to the same issue through a different route. My point is that the financing arrangements need to be scrutinized, and as long as there is a contract structure that is robust to this issue, rupee borrowing from foreign lenders should not be any riskier than borrowing from domestic financial institutions in rupees. It just seems to me that we might wish to pay attention to the details to ensure that this is the case.

Overall, I think that this is a great paper, which highlights a really important issue, and which is no surprise coming from these distinguished authors. Thanks for giving me the opportunity to discuss it.

General Discussion

Kenneth Kletzer, commenting on research on the paper, said that the paper references some fairly old ideas about unhedged borrowing and exchange rate stability and a little bit about original sin. He pointed out that a lot more thinking had followed the financial crises occurring before 2000, especially with reference to the development of domestic corporate bond markets. He noted that the corporate bond market in India is much smaller than the corporate borrowing from abroad and that encouraging corporate borrowing signifies a different direction than the lessons learnt from the financial crises of the 1990s and early 2000s. According to him, the problem pertained to underdeveloped domestic bond markets and access to foreign markets wherein the firms would endogenously hedge, with the expectation

of potential government guarantees or bailouts in the event of a sharp devaluation or depreciation, as also noted by the authors and the discussants.

Kletzer identified certain interesting questions with reference to the paper, including, firstly, concerning the people assessing the development and reasons for the development and encouragement of domestic corporate bond borrowing and, secondly, the comparison with international bond markets, whereby the Indian market looks really small as compared to not just the US bond market but also the Southeast Asian emerging economies, or even the economies of Malaysia or Chile, for example. He noted that one of the outliers wherein people talk about the reason why the bond market in India is so small and why there is so much foreign borrowing by corporates is by citing the example of Brazil's domestic market, which is grossly bigger than India's, and which presents an interesting agenda from the policy perspective by looking to develop borrowing in the presence of Byzantine regulations and sweeping reforms. He commented that other countries had done this as they had very small domestic borrowings and tight regulations on foreign borrowing, but they swept away these, resulting in severe crises in many parts of the world, including Mexico, East Asia, and Latin America.

Kletzer's next comment had to do with research, as he highlighted the issue of firm-level borrowing. He argued that one of the things that people had done in other countries was to look at bond issues and the choice of whether to issue that bond in domestic currency or foreign currency. This, however, posed a problem in the case of India, which is characterized by a very large percentage of private placements in the domestic market. It would, therefore, be interesting to examine the more recent literature on the development of domestic bond markets as well as the empirical literature on the endogenous choice, which deals with the econometric problem of choosing the currency in which to issue the bond and the currency in which it is issued internationally.

Mihir Desai cited the comment by Tarun Ramadorai on trade credit and wanted to know what the incentives would be. He opined that the incentive is ostensibly to switch toward the shorter duration trade credit. Secondly, he suggested that the large rise in foreign currency borrowing should be documented, but simultaneously, it is important to identify any indication of an associated rise in the natural hedges which would justify that. He said that what was relevant here was the issue of foreign direct investment (FDI). Citing an example, he said that if the company in question is, say, the Jaguar Land Rover (JLR) subsidiary of Tata Motors, the vast majority of cash flows would be in dollars and pounds as JLR is mainly involved in exports. In this case, it would thus be pertinent to have a back of the envelope calculation

about the degree to which the rise in foreign currency borrowing is, in some sense, not offset by FDI. These calculations could also be done on a firm by firm basis, as most of the firms involved are large ones, and an analysis of about 30 firms would denote the trend. The information technology sector, which accounts for a significant chunk of foreign currency borrowings, also mainly deals in cash flows in dollars. Finally, he wanted to know if anyone had studied the recent depreciation in currency and traced its effect on firms involved in foreign currency borrowings. He expressed surprise at the fact that this issue had hitherto not been raised by anyone, though there were indications of an unclear borrowing in this area.

Devesh Kapur noted that one of the graphs in the paper showed the recent growth of ECBs by financial firms. He urged the authors to provide a sense of these borrowings, as the ECBs of financial firms could be a big source of worry because of the inherent systemic risk. He questioned if they were public sector banks, private sector banks, or non-banking financial companies, and he also wanted to know who was doing this borrowing. Secondly, he argued that the presentation does not clearly explain the issue of the complexity and Byzantine nature of the regulations it talks of. The authors presenting the paper aver that these are jointly being implemented by a group comprising officials from the Ministry of Finance and the Reserve Bank of India (RBI). Kapoor asserted that since one of the authors is in the Ministry of Finance, they should be able to clarify why the Ministry of Finance agreed to these rules with which the authors obviously seem to disagree sharply. He also wanted to know if this reflects the bargaining power between the Ministry of Finance and RBI.

Anusha Chari raised the question of the systemic risk that is generated by leverage in the system and the fact that firms do not internalize what they are borrowing. This inevitably generates a risk when they are borrowing, which basically arises from the use of debt instruments rather than equity. She stressed that the manner in which capital controls have been implemented in other countries such as Brazil indicates that they have put on Tobin tax type of policies, wherein they add a tax if anybody wants to lend to a Brazilian firm, which introduces a whole set of distortions of its own. Her question, stemming from these issues, was that given that debt is a noncontingent claim, instead of putting on these capital controls, why do the countries not try and limit the leverage in a system by implementing macro prudential regulation? She also claimed that India is seemingly trying to do this, though in a complicated, mindboggling sort of way and asked the authors to express their thoughts on the use of macro prudential versus capital controls.

The authors Ila Patnaik and Nirvikar Singh thanked the participants for their comments and after responding to them on the floor said that they would also incorporate them in the revised version of their paper.

The session was brought to a close by the Chair Dr Shekhar Shah, who thanked the presenters, discussants, and participants in the floor discussion for the interesting session and the significant issues raised during it.