



# CORPORATE DEBT IN EMERGING ECONOMIES: A Threat to Financial Stability?

September 2015

## Committee on International Economic Policy and Reform

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# Introduction

During 1999-2007, the international balance sheets of emerging economies grew stronger through a combination of current account surpluses, a shift from debt funding to equity funding, and the stockpiling of liquid foreign reserves.<sup>1</sup> This risk-mitigating strategy improved the international financial standing of many emerging economies and helped these economies withstand the 2008-2009 global financial crisis.

However, a combination of domestic and external factors has led to a partial reversal of this strategy, with some emerging economies accumulating significant external debt since 2010. Previewed by the May 2013 “taper tantrum,” there has been considerable speculation that a tightening of dollar-funding conditions and a macroeconomic slowdown in emerging economies may result in financial instability in some emerging economies.

The risk of a global shock to international funding conditions is extensively documented.<sup>2</sup> In view of the central role of the dollar in international funding markets, global financial conditions are significantly influenced by the stance of U.S. monetary policy. In particular, it is now widely accepted that the federal funds rate plays an important role in determining the availability of dollar funding.<sup>3</sup>

In related fashion, and as recent experience with international spillovers suggests, the withdrawal of quantitative easing by the Federal Reserve could be associated with tighter funding conditions for international borrowers globally.<sup>4</sup> **If this is the case, the impact could be felt most acutely in those emerging economies with the deepest financial markets and the poorest economic fundamentals.**<sup>5</sup> The effect might come both from the quantity and the price sides since there might be a tighter supply of dollars but, at the same time, the cost of borrowing might increase in local currency terms. In addition, in terms of valuation effects, expected dollar appreciation will increase the value of dollar debt, as has been witnessed during the course of the past year, where the real burden of dollar-denominated debt has increased in emerging markets.<sup>6</sup>

In addition to the shift in dollar-funding conditions, macro-financial fundamentals have deteriorated in a number of emerging economies since 2007.<sup>7</sup> Current account balances have declined and foreign debt levels have increased. Credit growth has increased and leverage for some sec-

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<sup>1</sup> See Lane and Milesi-Ferretti (2007), Lane and Shambaugh (2010).

<sup>2</sup> See Milesi-Ferretti and Tille (2011), Forbes and Warnock (2012), Rey (2013) Inter-American Development Bank (2014) and Bruno and Shin (2015).

<sup>3</sup> See Bruno and Shin (2013a, 2013b), Rey (2013), Miranda-Agrippino and Rey (2014) and McCauley et al (2015).

<sup>4</sup> See Fratzscher et al (2013), Chen et al (2015), Sobrun and Turner (2015).

<sup>5</sup> See Eichengreen and Gupta (2014) and Avdjiev and Takats (2014).

<sup>6</sup> See BIS (2015), especially Chapter III.

<sup>7</sup> See also Inter-American Development Bank (2014).

tors (including the corporate sector) has climbed. Simultaneously, forecasts of potential output growth have been revised downward, and the drop in commodity prices has damaged the income prospects of commodity exporters.

The scale, composition, and volatility of international financial flows are a clear concern for policymakers in emerging economies.<sup>8</sup> Through a variety of channels, a reversal in international financial flows risks destabilizing their domestic financial markets and the real sectors. Countries running high current account deficits are particularly vulnerable to such reversals, facing the risk of a traditional sudden stop.<sup>9</sup> But those with large outstanding stocks of debt liabilities in foreign currency could be vulnerable as well, facing both rollover risk and risks to their financial terms of trade.<sup>10</sup>

Looking at international balance sheets, the traditional focus has been on the cross-border positions of banks and sovereigns. While these can be (and have been) sources of shocks, they are also amplification mechanisms for the difficulties emanating in the real sector. As we have seen on a number of occasions, a systemic financial disruption can have its origin in the strains on balance sheets in the nonfinancial and household sectors.

The (direct and indirect) international financial positions of nonfinancial firms have been drawing increasing attention.<sup>11</sup> Large corporates can directly obtain funding from international banks, the international bond market, and non-bank intermediaries, while small firms borrow from their own banks in foreign currency terms. Indirectly, the corporate sector may induce financial inflows by borrowing from the domestic financial sector that, in turn, obtains external funding. The foreign currency debt obligations of the corporate sector are of particular concern, whether owed to foreign creditors or domestic lenders.

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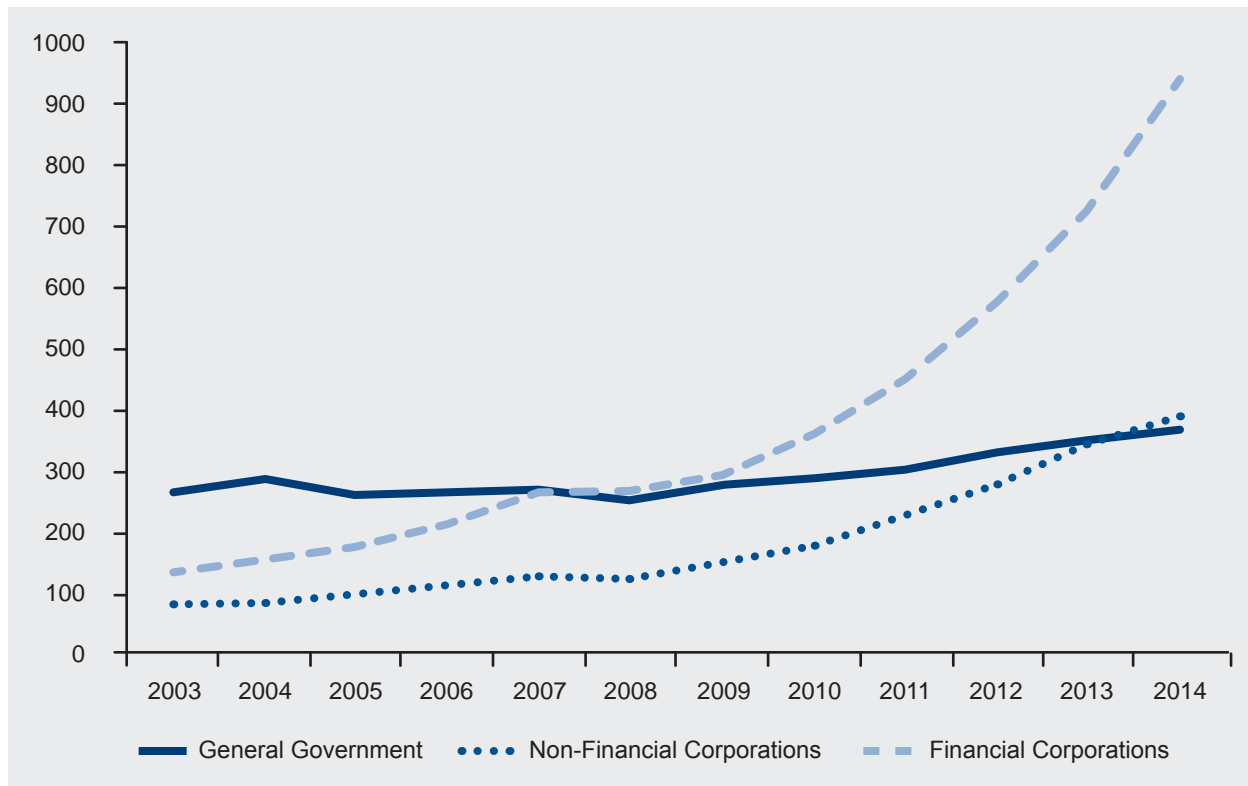
<sup>8</sup> See also the recent survey provided by Koepke (2015).

<sup>9</sup> See, among many others, Lane and Milesi-Ferretti (2012, 2015) and Korinek and Mendoza (2014).

<sup>10</sup> See Blanchard et al. (2010) and Catão and Milesi-Ferretti (2014).

<sup>11</sup> See Shin (2013) and Chui et al. (2014).

**Figure 1: International Bond Issuance by Emerging Market Economies**



Note: Emerging market includes Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, South Africa, Thailand, and Turkey. Financial corporations include banks and other financial corporations.

Source: BIS.

To get a sense of the scale, Figure 1 shows that much of this bond issuance has emanated from the private sector. Since 2010, financial corporate issuance has risen from less than \$400 billion per year to nearly \$1 trillion. Meanwhile, nonfinancial corporate issuance has roughly doubled, reaching \$400 billion by the end of last year. Table 1, which we reproduce from Fuertes and Serena (2014), shows that since 2000, emerging market corporates have been active in issuing bonds in both domestic and international markets.<sup>12</sup>

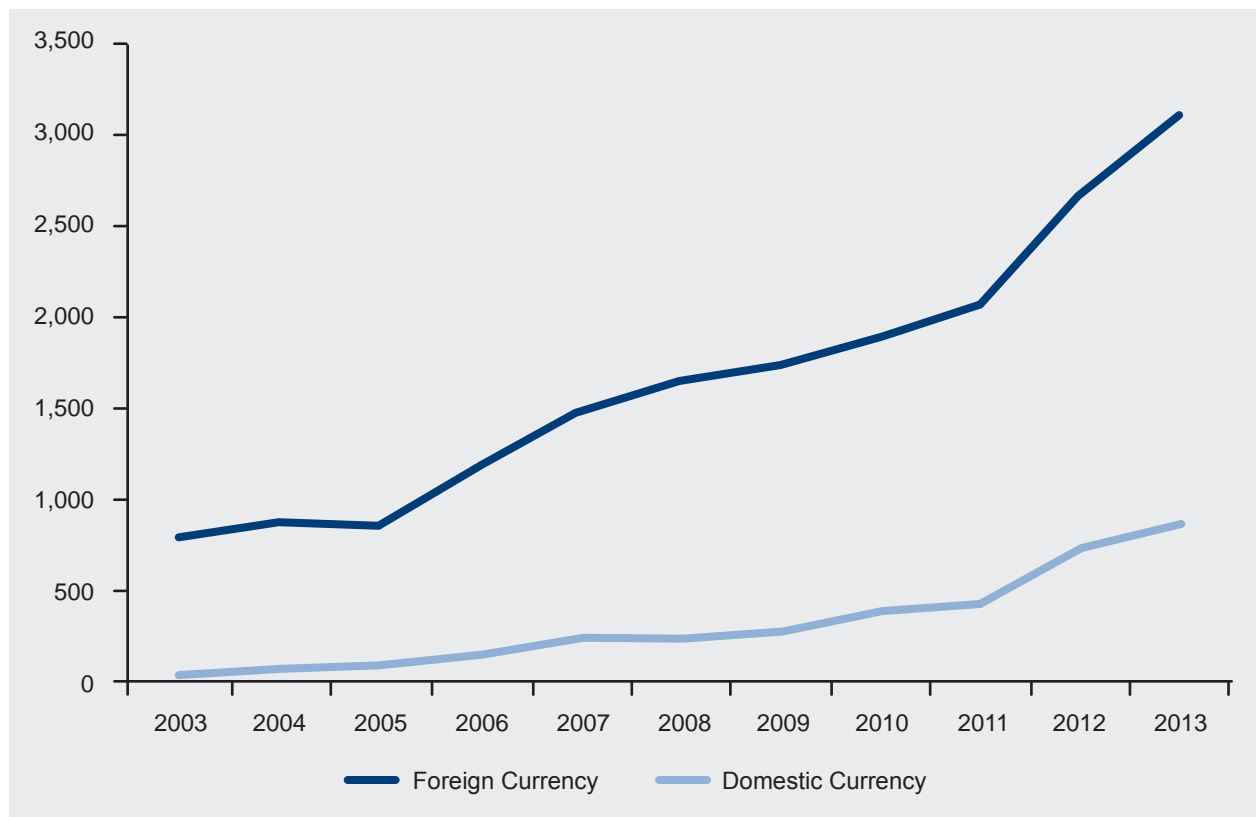
<sup>12</sup> See also Inter-American Development Bank (2014).

**Table 1: Bond Issuance by Emerging Market Nonfinancial Corporates  
(Cumulative Amounts, 2000-2013)**

	Bonds			Firms
	Number of Issues	Volume in US\$ Bn	Mean in US\$ Mn	Number of Issuers
<b>Bonds at International Markets</b>				
<b>Total</b>	2,391	971	406	890
<b>Latin America</b>	1,037	518	500	301
<b>Africa &amp; Middle East</b>	121	77	640	55
<b>Emerging Europe</b>	328	161	491	157
<b>Emerging Asia</b>	905	214	237	377
<b>Bonds at Local Markets</b>				
<b>Total</b>	10,808	1,260	117	1883
<b>Latin America</b>	1,559	266	170	551
<b>Africa &amp; Middle East</b>	317	64	203	81
<b>Emerging Europe</b>	950	147	155	427
<b>Emerging Asia</b>	7,982	783	98	824

Source: Adapted from Fuertes and Serena (2014).

**Figure 2: Currency Composition of Outstanding Emerging Market Bonds**



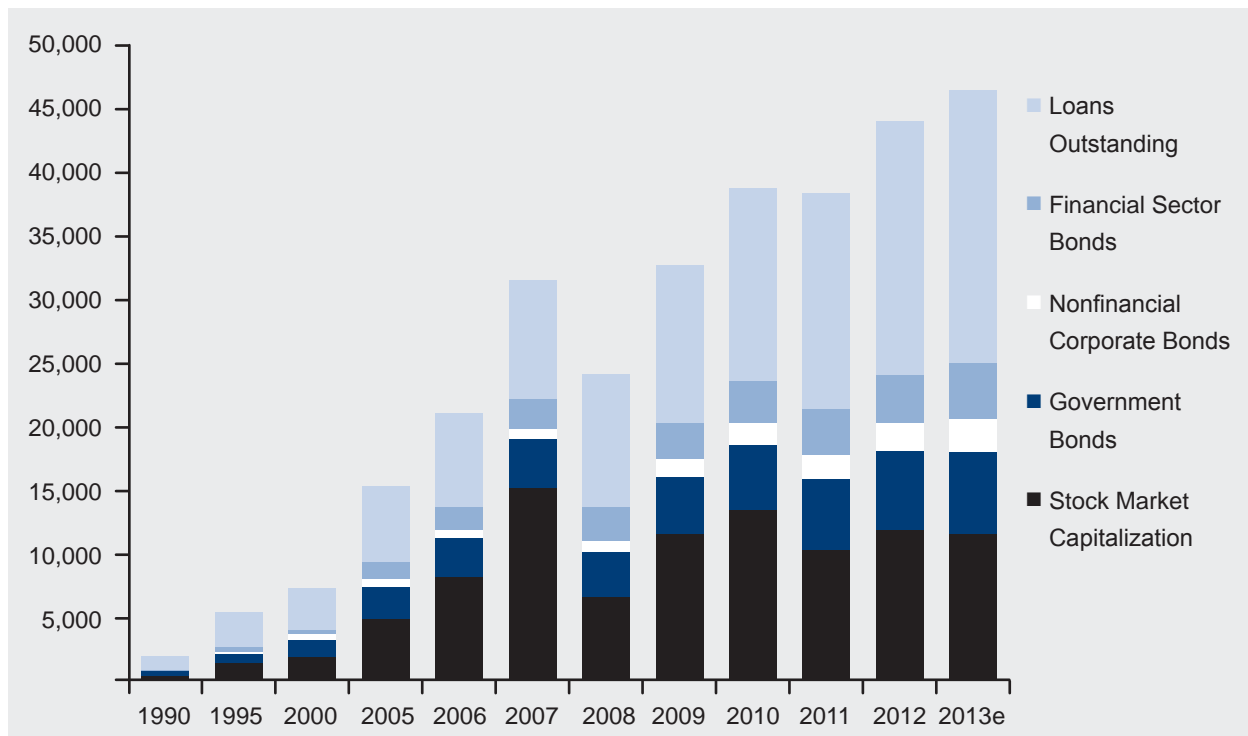
Note: Billions of U.S. dollars on vertical axis.  
Source: World Bank database



Not only have the volumes increased, as shown in Figure 2, but issuers have continued to favor foreign over domestic currency bonds. Here, the most recent data show that domestic-currency-denominated issues account for roughly 20 percent of the nearly \$4 trillion total.

It is important to emphasize that, while these numbers are growing rapidly, the overall quantities are still not all that large, given that the initial level of corporate bond issuance was quite limited. We see this from Figure 3, which breaks down all emerging market financial assets into five categories. The nonfinancial corporate bond component is denoted by the white slice in the middle of each bar. It accounts for 5.3 percent of the 2013 total. Adding in the stock of financial-sector (including financial affiliates of nonfinancial corporates) bonds gives a total of 14.8 percent.

**Figure 3: The Financial Structure of Emerging Market Economies**



Note: Billions of U.S. dollars on vertical axis.

Source: Adapted from Figure 1.3 in Buttiglione et al. (2014). Data provided by McKinsey Global Institute.

But even a category that appears relatively small can be a source of systemic financial instability. As we have seen in a number of circumstances, amplification mechanisms can be strong enough that even small shocks can have very large effects on the state of the financial system, and then on the real economy. With that in mind, we ask what risks foreign currency bond issuance by emerging market economies (EME) corporates may be creating.

Before we start, however, we should say that for many globally active corporations, including those based in EMEs, foreign currency bond issuance is a natural outgrowth of the expansion of their international sales, production, and supply chains. When both costs and revenues are denominated in foreign currency, it makes sense that treasury operations and capital structures also have substantial foreign currency components. So, to the extent foreign currency liabilities

are hedged by revenues in similar currencies, there may be little net risk directly to either the firm itself or financial institutions in the home country.<sup>13</sup>

However, aggregate mismatches can develop that increase exposures to an array of risk factors that can then influence the financial system as a whole and, as a result, the economy as a whole.

In the remainder of this introduction, we outline the set of risks the nonfinancial corporates face as a result of their foreign bond liabilities, and then discuss how it is that these might be transmitted to the aggregate economy.

## The External Debt of Corporates: Risk Factors

To begin, we see four risks that the firms themselves face—risks that either may not be fully internalized or may not be fully appreciated. In many ways, these are quite conventional. We call them maturity, currency, roll-over, and speculative risks.

Maturity mismatches can arise in the usual way, with corporates relying on short-term funding streams booked against longer-term revenue streams. Currency risk is similar, where corporates have domestic currency assets against foreign currency liabilities, which can arise from the fact that covariation between the exchange rate and variables that affect profitability (such as commodity prices or levels of domestic and foreign demand) may be underestimated. For instance, firms in non-traded sectors are especially exposed to shifts in the exchange rate.

Next comes rollover risk. Corporate bond funding poses specific risks.<sup>14</sup> While emerging market corporate bond issuance has grown quickly in recent years, the resilience of the investor base for this asset class remains unknown.<sup>15</sup> In particular, investor sentiment may be especially sensitive to shifts in financial opportunities in other segments of the dollar-based financial markets and to negative shocks to the macroeconomic, sectoral, and firm-level projections for the issuers. Moreover, even in scenarios in which professional investors might be willing to ride out some temporary shock, bond funds may be forced to sell positions and decline to rollover holdings to meet redemption requests by the ultimate investors, especially since emerging market funds tend to hold correlated portfolios and correlated redemption profiles.<sup>16</sup> Moreover, the benchmark-tracking strategies adopted by many of these funds generate a pro-cyclical pattern by which flow levels and asset prices positively co-move.

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<sup>13</sup> See Bleakley and Cowan (2008) and Kalemli-Özcan et al. (2015).

<sup>14</sup> Much of this debt has been issued through overseas affiliates, including financial corporation affiliates of nonfinancial parent corporations. This pattern includes issuance through special purpose vehicles located in offshore financial centers. See Shin (2013), Avdjiev et al. (2014), and Fuertes and Serena (2014).

<sup>15</sup> See also International Monetary Fund (2014, 2015) and Inter-American Development Bank (2014). In part, the surge in corporate bond issuance by emerging market economies reflects a global increase in corporate bond issuance. International Monetary Fund (2015) documents the cross-country compression in spreads for corporate bonds: It is increasingly a global asset class. Fuertes and Serena (2014) calculate that the maturity profile of corporate bond issuance by emerging market firms is lengthening.

<sup>16</sup> See Miyajima and Shim (2014).

Finally, there is what we have labeled speculative risk, which is generated if the treasury operation of a corporate acts as a profit center (by taking open positions in currency derivatives or exploiting carry trade opportunities across domestic and foreign markets), with the attendant risk profile of financial speculative activity.<sup>17</sup>

At a global level, Bruno and Shin (2014) describe how, more generally, corporate risk-taking increases, especially for multinational corporations and those sectors most reliant on external financing, when risk-spreads are compressed (what the authors label a period of high *global liquidity*, which tends to be proxied by a fall in composite risk indices like the VIX). By the same token, these firms suffer the greatest tightening in credit conditions during crisis periods (such as 2001 and 2008-2009). Moreover, interconnections among firms (such as production chains among suppliers) mean financial shocks to one firm affect activity levels quite widely.<sup>18</sup> Furthermore, increases in corporate leverage can amplify commodity price dynamics, with price declines perversely forcing leveraged commodity producers to increase output in an effort to meet debt servicing obligations, thereby driving prices down even further.<sup>19</sup>

Should risks to nonfinancial corporates materialize, and their financial health becomes impaired, these shocks can be transmitted to the financial system both directly and indirectly. Starting with the direct channel, we see four mechanisms. First, the creditworthiness of a corporate with both foreign and domestic components in its consolidated balance sheet is compromised if it takes losses on its foreign financial activities. These foreign losses would increase the riskiness of the assets on the balance of domestic financial intermediaries with which the firm is engaged. Second, if it cannot rollover its foreign liabilities, the corporate may need to withdraw liquid assets from the domestic financial system or seek to liquidate other domestic financial assets to meet its immediate obligations.<sup>20</sup> Third, if the corporate has hedged its foreign currency exposure using derivatives in which the domestic bank is a counterparty, settlement could lead to impairment of the bank.

Finally, there is evidence that, when large corporations lose access to bond markets, they turn to banks. Favoring these generally more creditworthy borrowers, the banks then reduce funding to small- and medium-sized enterprises (SMEs). That is, SME access to bank lending is negatively related to the external funding conditions faced by large corporates.<sup>21</sup>

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<sup>17</sup> Chui et al. (2014) also highlight the limited nature of foreign currency hedging contracts for many emerging market currencies, with the level of protection circumscribed by “knock in, knock out” (KIKO) features.

<sup>18</sup> See Kalemli-Özcan et al. (2013).

<sup>19</sup> See Domanski et al. (2015).

<sup>20</sup> There is some evidence that such vulnerabilities may be rising. As Chui et al. (2014) find, corporate deposits (both local currency and foreign currency) in emerging market economy banking systems have been increasing. In addition, Adjiev et al. (2014) document the growth in non-bank debt funding to emerging economies. See also Hattori et al. (2009) and Turner (2010).

<sup>21</sup> Carabarin et al. (2015) show that bond issuance by large Mexican corporates frees up lending capacity for SMEs in Mexico.

Turning to indirect mechanisms through which the strains on corporate balance sheets can translate into systemic financial risk, we see three mechanisms. Two work through banks and the third influences the economy at large. First, there is a possibility that corporates are providing intermediation services, making short-term loans to non-bank financial intermediaries that are in turn counterparties to the banks. Again, should the corporate lender come under stress and withdraw funding, this type of shock would then be transmitted to the banks.

We subscribe to the generally held view that the potential for firms to act as financial intermediaries and engage in speculative activity is greater in emerging economies than in advanced economies. The primary reason for this is that the regulation of financial firms tends to be stricter in EMEs than it is in the advanced world. For example, capital requirements have a tendency to be higher and more likely to bind, the definition of capital tends to be stricter, and the risk weights on assets are more conservative.<sup>22</sup> The natural result is that corporate borrow more, both because it is less costly and because they can then on-lend the funds, evading the costly regulatory burdens faced by banks.<sup>23</sup>

Second, as highlighted by Schreger and Wu (2014), in an environment where the EME sovereigns have issued a significant quantity of domestic-currency debt, a high stock of foreign currency corporate debt may increase the incentive for fiscally stressed sovereigns to default on domestic-currency debt rather than engage in currency depreciation. Knowing this, investors will drive up the sovereign risk premium. If domestic banks hold substantial volumes of domestic-currency sovereign debt, the result will be a loss in the mark-to-market value of some of their assets, a reduction in their capitalization, and an increase in systemic risk.

In addition, high corporate leverage may pose macroeconomic or sectoral risks if financial losses threaten the viability of the firm or require a scaling down in the level of production. While these risks might be perceived as non-material at the level of an individual firm, correlated strategies across corporates mean that the scale of aggregate risk-taking may be substantial.

## Empirical Trends

While the traditional focus has been on the external positions of banks and sovereigns, it is also important to monitor the external obligations of the corporate sector. In addition, it is vital to understand the domestic intersectoral linkages between the financial system and corporates, such

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<sup>22</sup> Shin and Zhao (2013) provide supporting evidence for samples of large Chinese and Indian firms that exhibit balance sheet dynamics that characterize financial intermediaries, in contrast to the patterns for U.S. nonfinancial firms. In particular, there is evidence of positive covariation between financial assets and financial liabilities of large firms in the emerging economies (consistent with a financial intermediation role), whereas the comovement is typically negative for nonfinancial corporates that more typically issue financial liabilities or run down financial assets to finance capital projects.

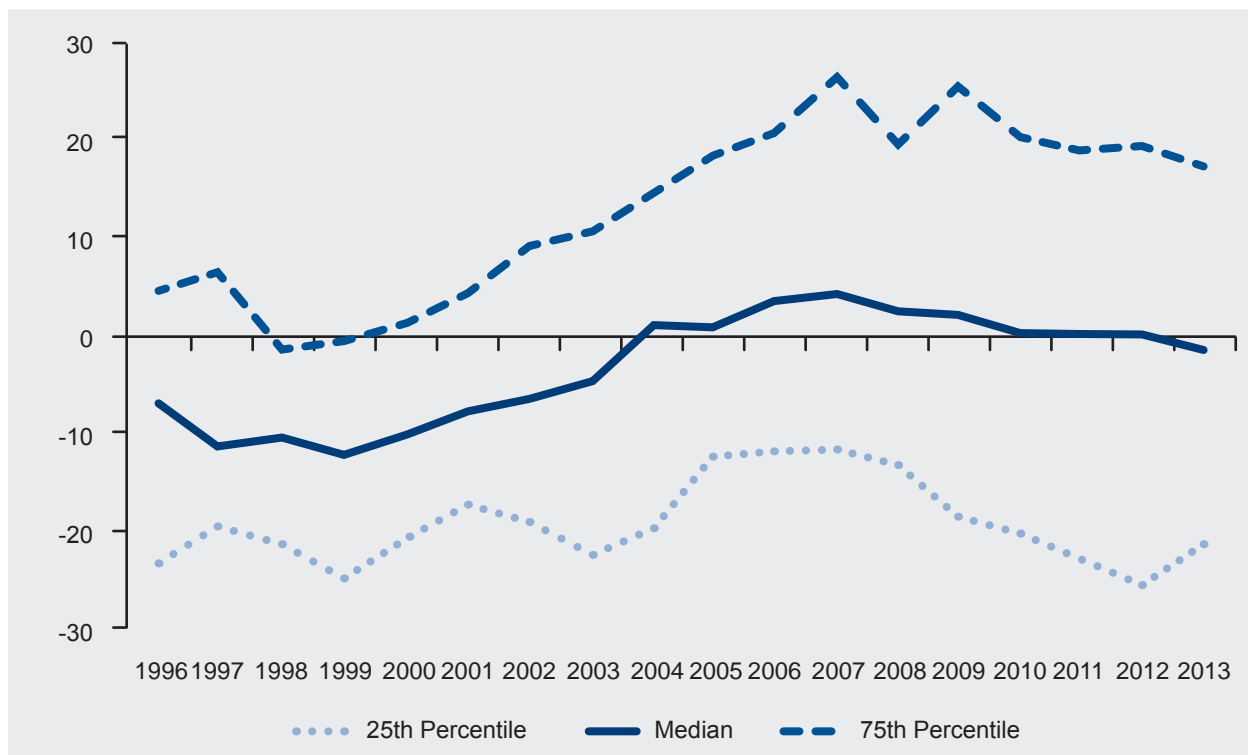
<sup>23</sup> Lanau (2011) provides evidence that direct cross-border lending intensifies if a tightening of macroprudential regulations restricts credit provision by domestic banks. As emphasized by Drehmann (2013), the substitutability across different credit channels means that it is important to analyze the dynamics of total credit (including the issuance of debt securities and direct cross-border credit) in addition to domestic credit.

as foreign currency borrowing of corporates from banks, since risks can arise through indirect channels.

The risk profile of emerging economies substantially improved over 1999-2007 through a combination of current account surpluses, a shift from debt-type liabilities to equity-type liabilities and an increase in holdings of liquid foreign assets.<sup>24</sup> As is shown in Figure 4, after a long period of improving positions, there has been a deterioration in the net foreign debt positions of many emerging economies in recent years. This has largely taken the form of an increase in foreign bond liabilities, with Figure 5 showing an increase in the share of bond liabilities in total foreign debt liabilities.

Based on Bank for International Settlements (BIS) data, shown in Figure 1, much of the bond issuance has emanated from the private sector (financial corporates and nonfinancial corporates). Fuertes and Serena (2014) show that emerging market corporates have been active in issuing bonds in both domestic and international markets (shown in Table 1).<sup>25</sup> These authors also show that the financial corporate data include the financial subsidiaries of nonfinancial corporates (Table 2). The relative importance of nonfinancial corporates and governments in international bond issuance is also captured in the net issuance data plotted in Figure 6.

**Figure 4: Net Foreign Debt Positions of Emerging Market Economies**



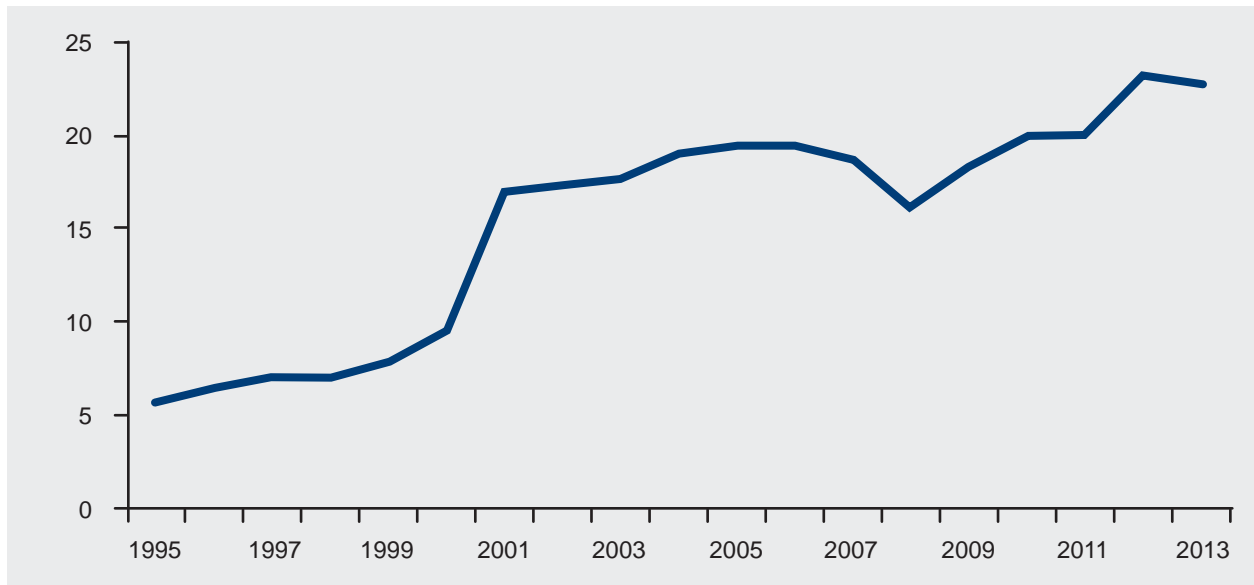
Note: Percent of GDP on vertical axis. Percentiles of cross-country distribution of net foreign debt positions among emerging economies.

Source: Updated version of dataset reported in Lane and Milesi-Ferretti (2007).

<sup>24</sup> See Lane and Milesi-Ferretti (2007) and Lane and Shambaugh (2010).

<sup>25</sup> See also Inter-American Development Bank (2014).

**Figure 5: Bond Liabilities as a Percentage of Foreign Debt Liabilities: Emerging Market Economies**



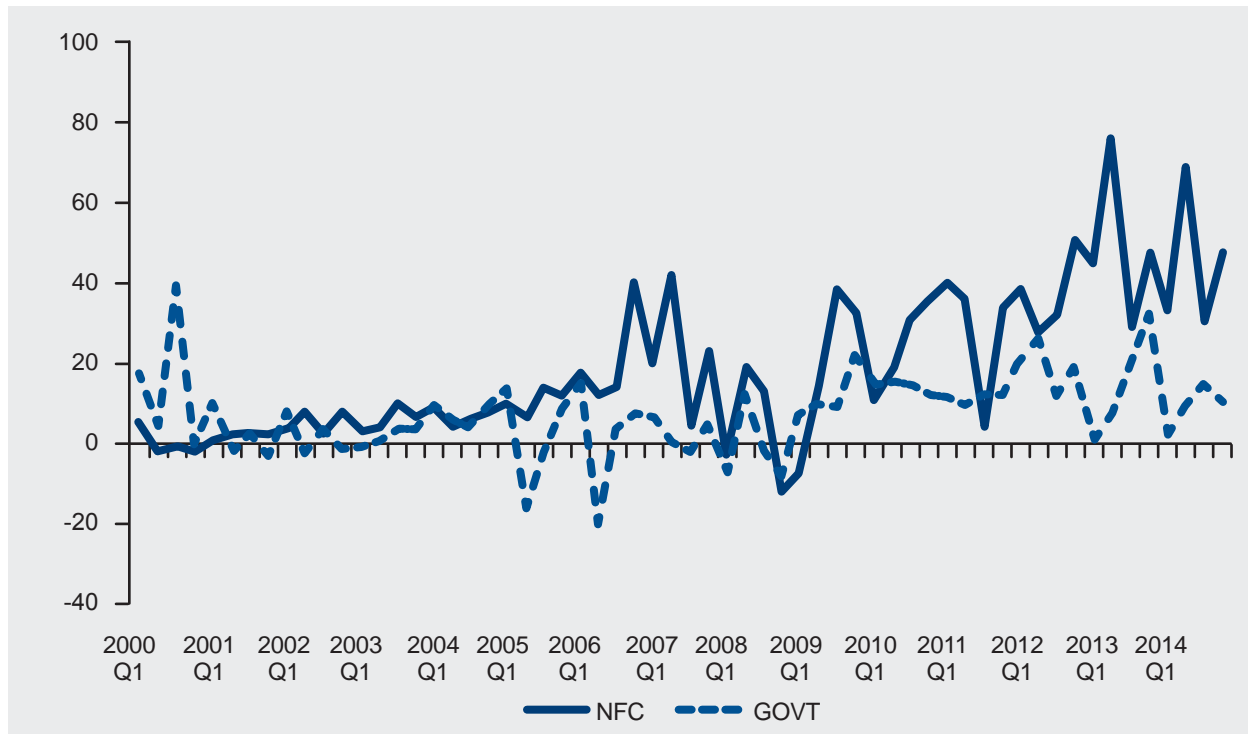
Note: Percent of foreign debt liabilities on vertical axis.  
Source: Updated version of dataset reported in Lane and Milesi-Ferretti (2007).

**Table 2: Examples of Bonds Issued by Financial Special Purpose Vehicles**

Company Name	Parent Company	Incorporated	Country of Risk	Amount (US\$ Bn)
<b>Petrobras Global Finance BV</b>	PETROBRAS - PETROLEO BRAS-PR	Netherlands	Brazil	3.5
<b>Lukoil International Finance BV</b>	LUKOIL OAO	Netherlands	Russia	1.5
<b>Gazprom Neft OAO Via GPN Capital SA</b>	GAZPROM NEFT OAO-CLS	Luxembourg	Russia	1.5
<b>Russian Railways via RZD Capital PLC</b>	RUSSIAN RAILWAYS JSC	Ireland	Russia	1.3
<b>AngloGold Ashanti Holdings PLC</b>	ANGLOGOLD ASHANTI LTD	Isle of Man	South Africa	1.3
<b>Metalloinvest Finance Ltd</b>	METALLOINVEST HOLDING CO OAO	Ireland	Russia	1
<b>SABIC Capital II BV</b>	SAUDI BASIC INDUSTRIES CORP	Netherlands	Saudi Arabia	1

Source: Adapted from Fuertes and Serena (2014).

**Figure 6: Net International Bond Issuance by Emerging Market Nonfinancial Corporates and Governments**

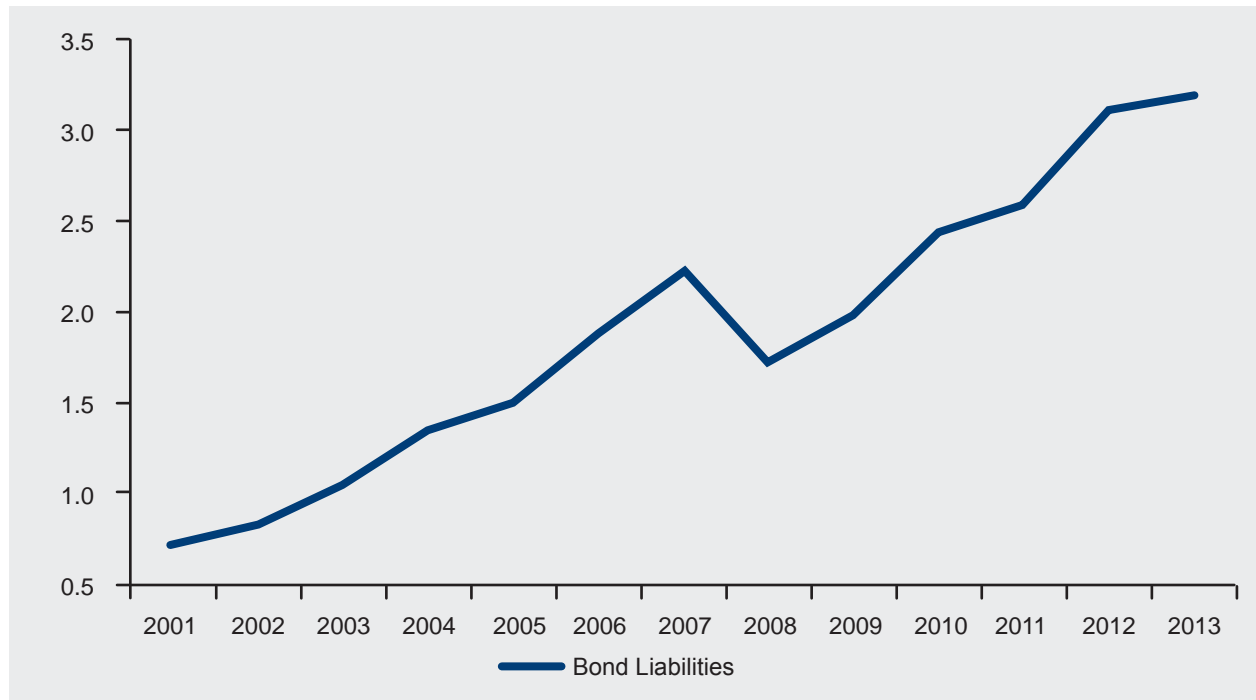


Note: Billions of U.S. dollars on vertical axis.

Source: Adapted from BIS Global Liquidity Indicators (February 2015).

Foreign investors are major holders of emerging market bonds, as shown in Figure 7. In terms of risk exposures, the predominant role of foreign currency bonds is striking (see Figure 2). In emerging Asia, the corporate sector has been the largest issuer of foreign currency bonds in recent years (Figure 8). These trends have contributed to an overall decline in the net foreign currency position of many emerging economies (Figure 9).<sup>26</sup>

<sup>26</sup> Net foreign currency positions are calculated using the methods reported in Lane and Shambaugh (2010) and Benetrix et al. (2015).

**Figure 7: Foreign Holdings of Emerging Market Bonds**

Note: Trillions of U.S. dollars on vertical axis.

Source: Derived foreign bond liabilities from Coordinated Portfolio Investment Survey.

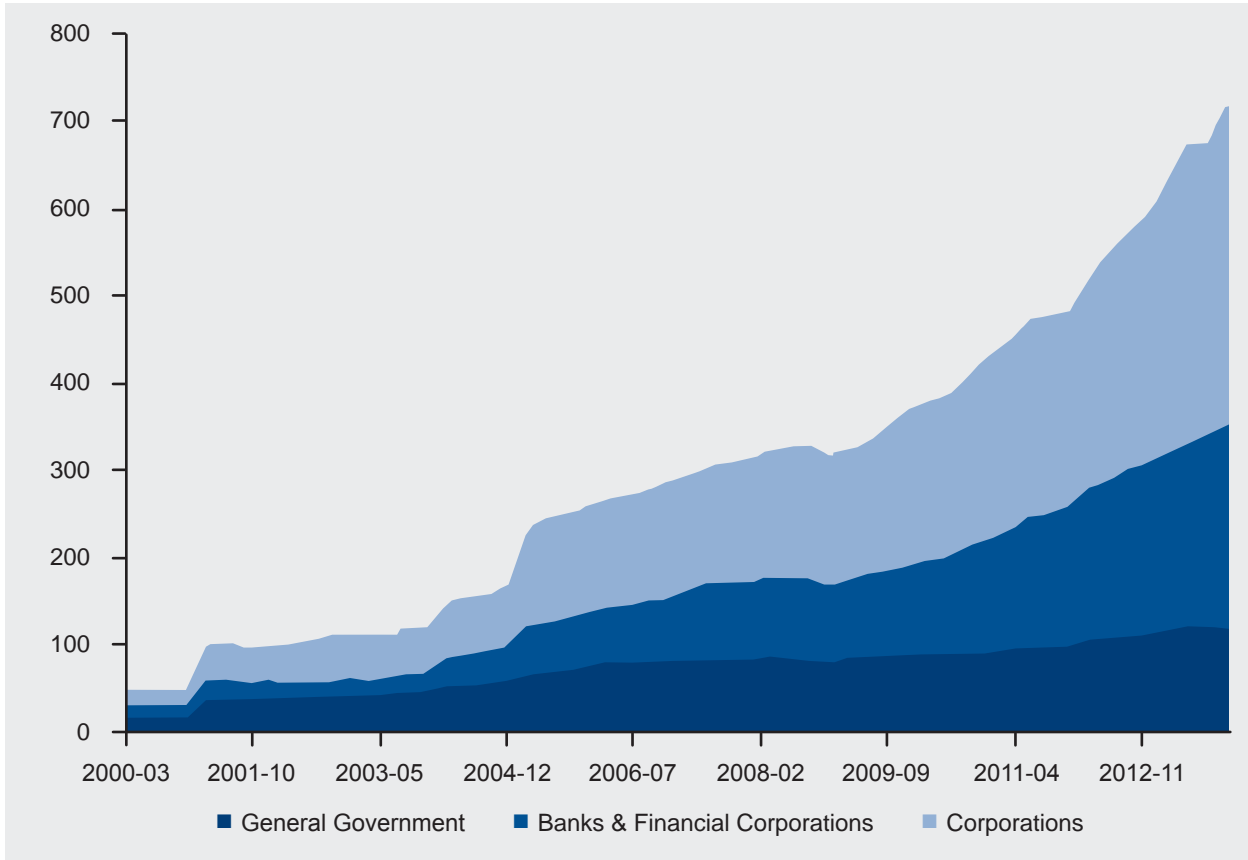
Figure 10 shows the dynamics of international bond flows to emerging markets. After a period of robust growth from mid-2009 to mid-2013, monthly bond flows have been quite volatile in the wake of the May 2013 “taper tantrum.”

These trends are consistent with the evidence provided by Buttiglione et al. (2014) on the growth in private-sector indebtedness in emerging market economies (Figure 11 and Table 3). Drawing on data provided by the McKinsey Global Institute, Figure 3 displays that the expansion in the size of the financial systems of emerging market economies has been dominated by debt instruments.

Finally, Figure 12 documents that the non-core liability ratio for emerging market banks has climbed since 2009. To the extent that the non-core funding for banks is correlated with the scale of external funding raised by nonfinancial corporates, this increase in funding vulnerability is worth monitoring.

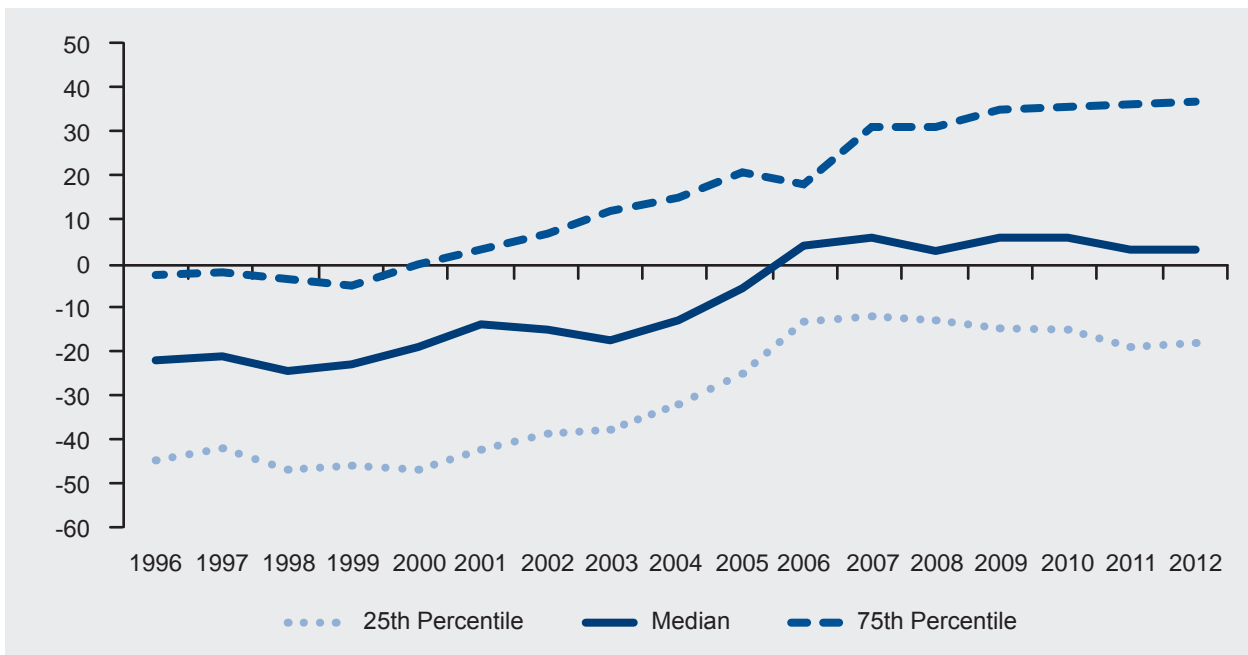


**Figure 8: Sectoral Composition of Foreign Currency Bonds for Emerging Asia**



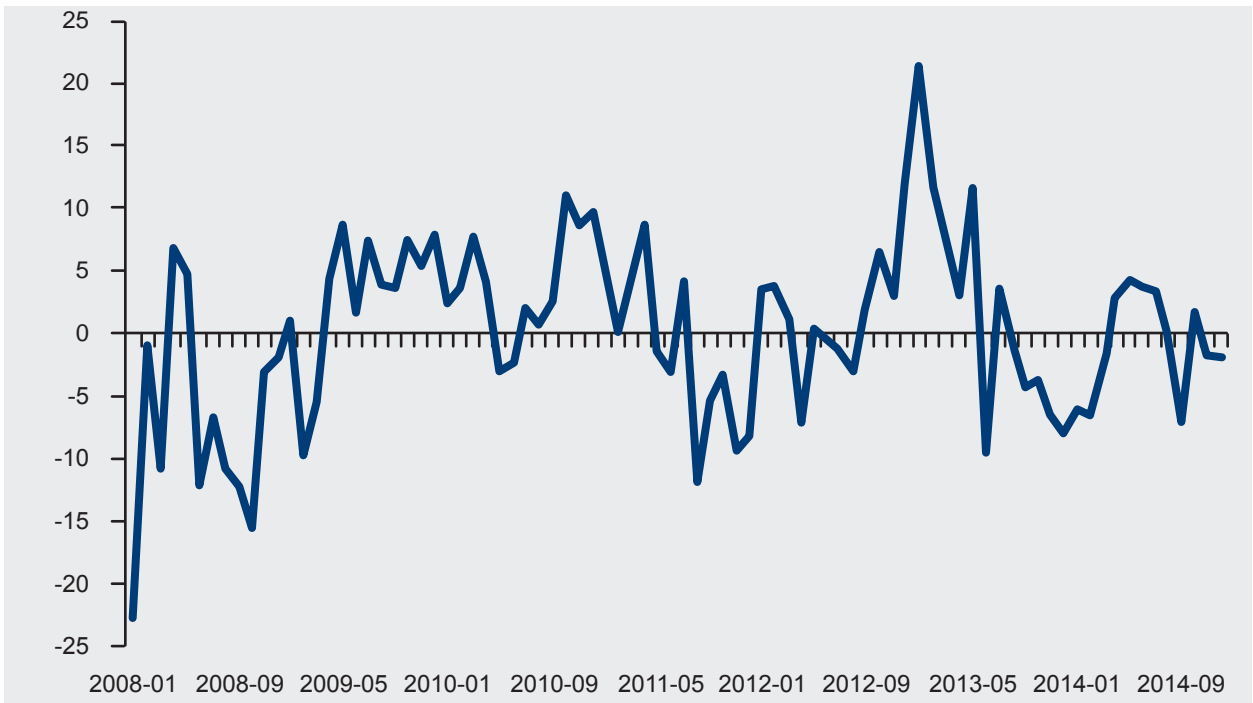
Note: Billions of U.S. dollars on vertical axis.  
Source: Data from Asian Development Bank.

**Figure 9: Net Foreign Currency Positions of Emerging Market Economies**



Note: Percent of GDP on vertical axis.  
Source: Based on dataset and methods reported in Benetrix et al. (2015).

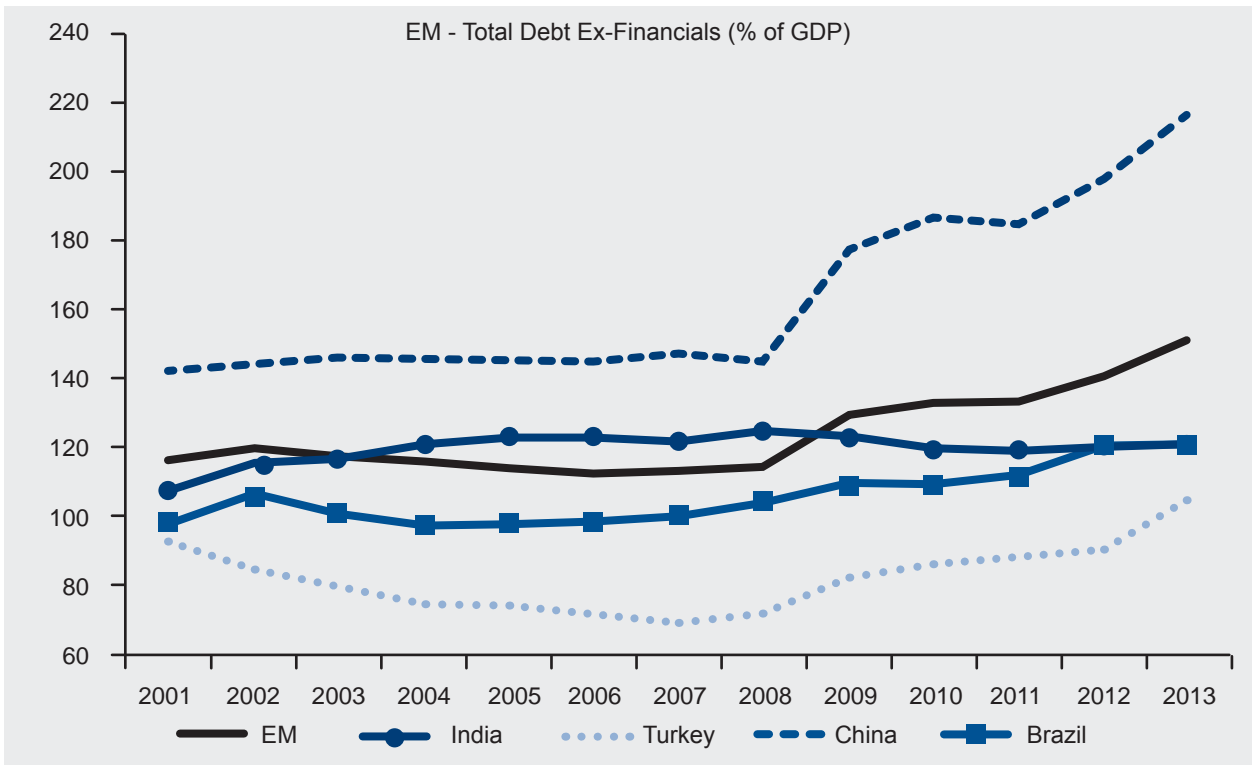
Figure 10: Emerging Market Bond Flows



Note: Billions of U.S. dollars on vertical axis.

Source: Adapted from BIS Global Liquidity Indicators (February 2015).

Figure 11: Debt Liabilities of Nonfinancial Sector in Emerging Market Economies



Note: Percent of GDP on vertical axis.

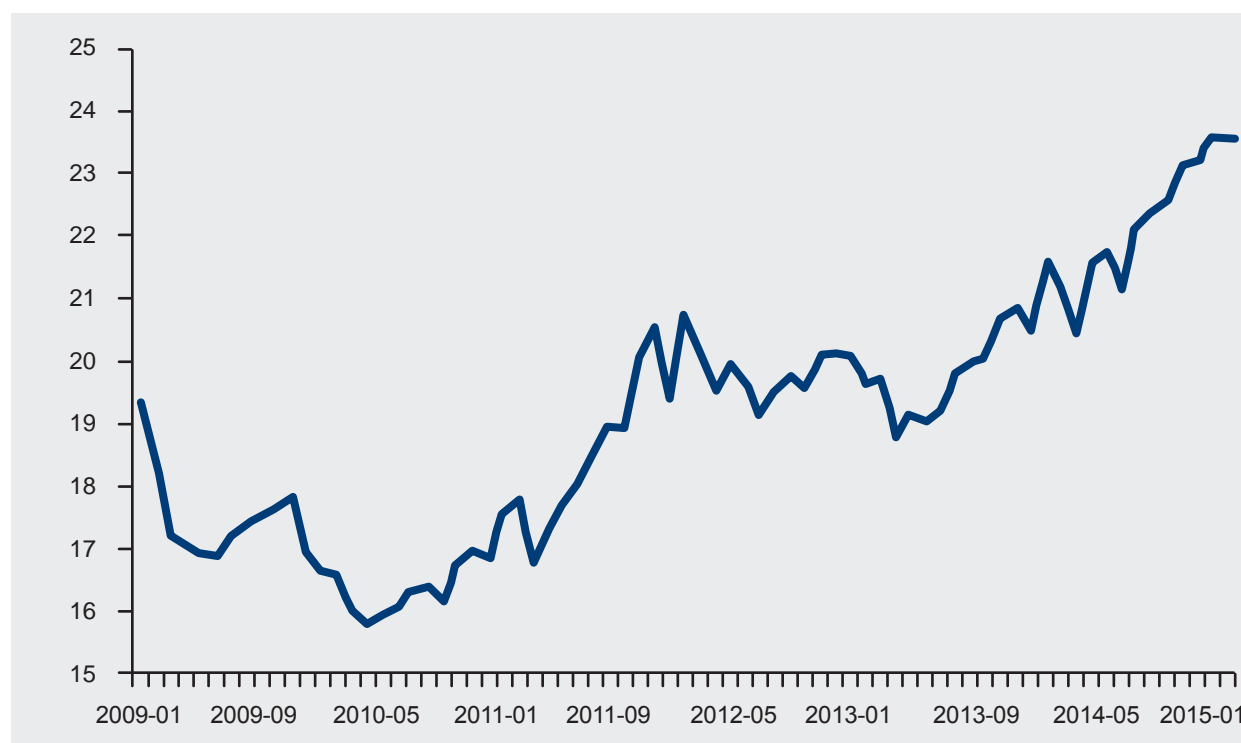
Source: Adapted from Figure 2.3 in Buttiglione et al. (2014). Data sources from OECD, IMF, and national accounts data.

**Table 3: Sectoral Debt Ratios in Selected Emerging Market Economies (2013)**

2013	Total Ex-Financials	GOVT	PRIVATE	EXT	NIIP
Emerging Markets	151	48	102	23	-9
Hungary	223	79	144	148	-103
China	217	49	168	9	18
Czech Republic	131	48	83	56	-51
Poland	136	57	79	73	-71
Thailand	150	45	105	36	-26
Argentina	129	47	82	28	2
South Africa	127	45	82	39	-11

Note: PRIVATE is sum of nonfinancial corporate and household debt; EXT is external debt; NIIP is net international investment position. Units are in percent of GDP

Source: Adapted from Table 2.1 in Buttiglione et al. (2014).

**Figure 12: Non-Core Liability Ratio for Emerging Market Banks**

Note: Percent on vertical axis.

Source: Adapted from BIS Global Liquidity Indicators (February 2015).

In summary, there has been a noticeable shift in the international financial positions of emerging market economies in recent years. After a sustained period in which international balance sheets were improving and risk factors declining, the sharp increase in gross debt liabilities (especially

in foreign currency debt) marks a new phase. In turn, this has made emerging economies more vulnerable to a shift in international funding conditions and macroeconomic slowdown.<sup>27</sup>

In the following sections, we explore the role of corporate debt in emerging economies in more detail through a series of case studies. A case study approach is helpful in view of the heterogeneous role played by corporate debt in different financial systems in emerging economies. Such variation is to be expected given the multiple functions of corporate debt outlined above, which will vary in importance depending on the macro-financial regime in a given emerging economy or region. In Section 2, we study the implications of external commercial borrowings (ECBs) in India. In Section 3, we examine foreign currency lending to Turkish corporates. Next, in Section 4 we consider evidence from Latin America. Finally, in Section 5 we examine the policy agenda and offer conclusions.

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<sup>27</sup> See also Forbes (2012a, 2012b).

## 2. Case Study I

### External Commercial Borrowings in India

External commercial borrowings (ECBs) are the largest component of India's external debt. According to a report by the Indian Finance Ministry, the total stock of external debt at the end of 2014 was \$461.9 billion of which 37 percent was made up of external commercial borrowings.<sup>28</sup> The other major components of external debt are deposits of non-resident Indians (23.8 percent), loans from multilateral or bilateral agencies (17.4 percent), and short-term trade credit (17.1 percent). Of the \$170.8 billion in commercial borrowings, almost 60 percent is in the form of commercial bank loans, while the rest is categorized as securitized borrowings which include foreign currency convertible bonds (FCCB).

Although Indian corporates have been able to raise money abroad since the early 1970s, ECBs only constituted a modest fraction of the total external debt until the 1990s, since concessional debt from bilateral and multilateral agencies dominated. In 1995, the ratio of ECBs to external debt was only 13.1 percent.<sup>29</sup> It had risen to 19.7 percent by 2005 before rapidly climbing to the current level of 37 percent at the end of 2014. Multiple factors have been suggested for the increasing dominance of ECBs in India's external debt. These include strong investment demand at home, increase in investor risk appetite for emerging market credit, rising domestic interest rates relative to foreign rates, improved sovereign credit ratings, and continued underdevelopment of India's local corporate bond market.

The major purposes for which ECBs are undertaken are import of capital goods, modernization, rupee expenditures on local capital goods, overseas acquisitions, new projects, and refinancing of existing ECBs. The refinancing of rupee loans is also permitted but requires approval from India's central bank, the Reserve Bank of India (RBI). On-lending or investment of proceeds in capital markets in India is generally not permitted. Debt maturities have a floor of three years while amounts and costs are capped. Currently, a maximum of \$750 million can be raised by a company in a given year, and for loans with a maturity over five years, the all-in cost is capped at 500 basis points above six-month LIBOR.

Indian firms that borrow abroad are exposed to the risk that a depreciation in the Indian rupee (INR) would raise their interest costs and debt burden. With this in mind, we examine a set of three questions.

First, are firms with higher external borrowing more affected by adverse exchange rate movements? It is possible that the firms that are borrowing abroad are also hedging their foreign exchange exposure. This hedging could be either through natural hedges, if they are primarily exporters, or through financial instruments like derivatives. A measure of effective exposure to

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<sup>28</sup> See the discussion at: [http://finmin.nic.in/the\\_ministry/dept\\_eco\\_affairs/economic\\_div/ExternalDebt\\_Dec14\\_E.pdf](http://finmin.nic.in/the_ministry/dept_eco_affairs/economic_div/ExternalDebt_Dec14_E.pdf).

<sup>29</sup> See Mohan (2007).

foreign exchange risk can be obtained from market prices, by looking at how sensitive stock returns are to movements in currency rates.<sup>30</sup>

This leads to our second question regarding Indian firms: Is effective exposure to foreign exchange risk better captured by market-based measures such as FX  $\beta$  (the sensitivity of a firm's excess returns to the exchange rate) than by balance sheet ratios of foreign borrowing?

Finally, if firms are not adequately hedged, their balance sheet position becomes more relevant. Firms with higher foreign borrowing and unhedged exposure are more vulnerable. With this in mind, we ask our third question: Within high FX  $\beta$  firms, are those with a higher proportion of foreign borrowing with respect to total debt or assets more vulnerable to exchange rate shocks?

To examine these three questions, we start with Reserve Bank of India data on foreign borrowings of Indian firms.<sup>31</sup> For every month since January 2004, data are available on all instances of external commercial borrowing and foreign currency convertible bonds. For each issue, there is information identifying the borrower, the size of the issue in U.S. dollars, and the maturity of the issue.

Financial information on publicly traded firms comes from the Prowess database of the Centre for Monitoring Indian Economy (CMIE). The database has annual balance sheet and income statement data as well as daily data on stock prices. There are 468 firms that can be matched between Prowess and the RBI database of foreign borrowings. These matched firms comprise the sample of companies used in the subsequent analysis. The time period is from 2004-2014. Data on the National Stock Exchange (NSE) NIFTY index of 50 firms and the USDINR exchange rate over this period are obtained from Datastream.

Table 4 shows summary statistics on the ECB issuance characteristics of our matched sample. The median firm had two issues during the sample period. These issues tend to be of fairly long maturity: Average issue maturity is just over 6 years and more than 95 percent of issues are of over 3 years maturity. The median issue size is \$20 million while the average size is over \$67 million. Figure 13 traces out how the average amount (inflation-adjusted) and maturity have varied over the sample period. While maturity has stayed fairly constant, the average amount borrowed rose

**Table 4: Summary Statistics: ECB Data**

2013	N	Mean	Median	St. Dev.	P5	P95
Amount (US\$ mn)	1,780	67.942	20	148.259	3	300
Maturity (Years)	1,780	6.239	5.25	2.518	3	11.25
Number of Facilities (Per Firm)	468	3.803	2	4.907	1	13

Note: The sample is restricted to 468 firms that can be matched to Prowess. The sample period is January 2004 to December 2014.

Source: Summary statistics from External Commercial Borrowing Data shared on the RBI site.

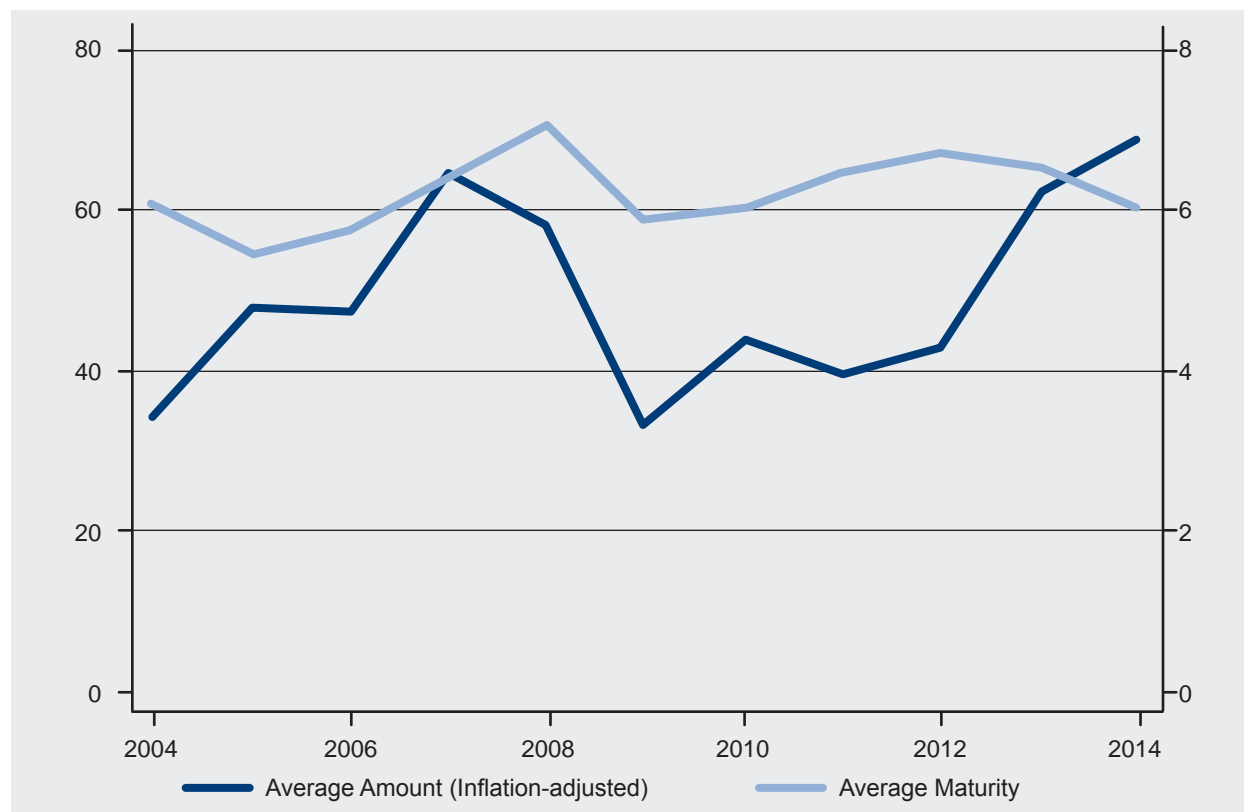
<sup>30</sup> See also Dominguez (1998), Dominguez and Tesar (2006), and Ito et al. (2015) on the value of inferring exchange rate exposures from the sensitivity of stock market returns to currency movements.

<sup>31</sup> The data are available at: <https://rbi.org.in/Scripts/ECBView.aspx>.

sharply in the pre-crisis years before falling rapidly. In the last few years, average amounts have recovered to pre-crisis levels.

Table 5 has summary statistics on the balance sheets of our matched firms. About a third of the debt of these firms is denominated in foreign currency. The ratio of debt to assets in the average firm-year is about 0.35. Figure 14 plots the time variation in the average values of these ratios. While the leverage employed by the companies in our sample has been trending higher, foreign borrowing as a proportion of total debt has been more cyclical. It went up sharply in the years before the crisis, peaking in 2007 before coming back down. There was an increase in 2012 before it went back down in 2013 and 2014.

**Figure 13: Issuance Characteristics**



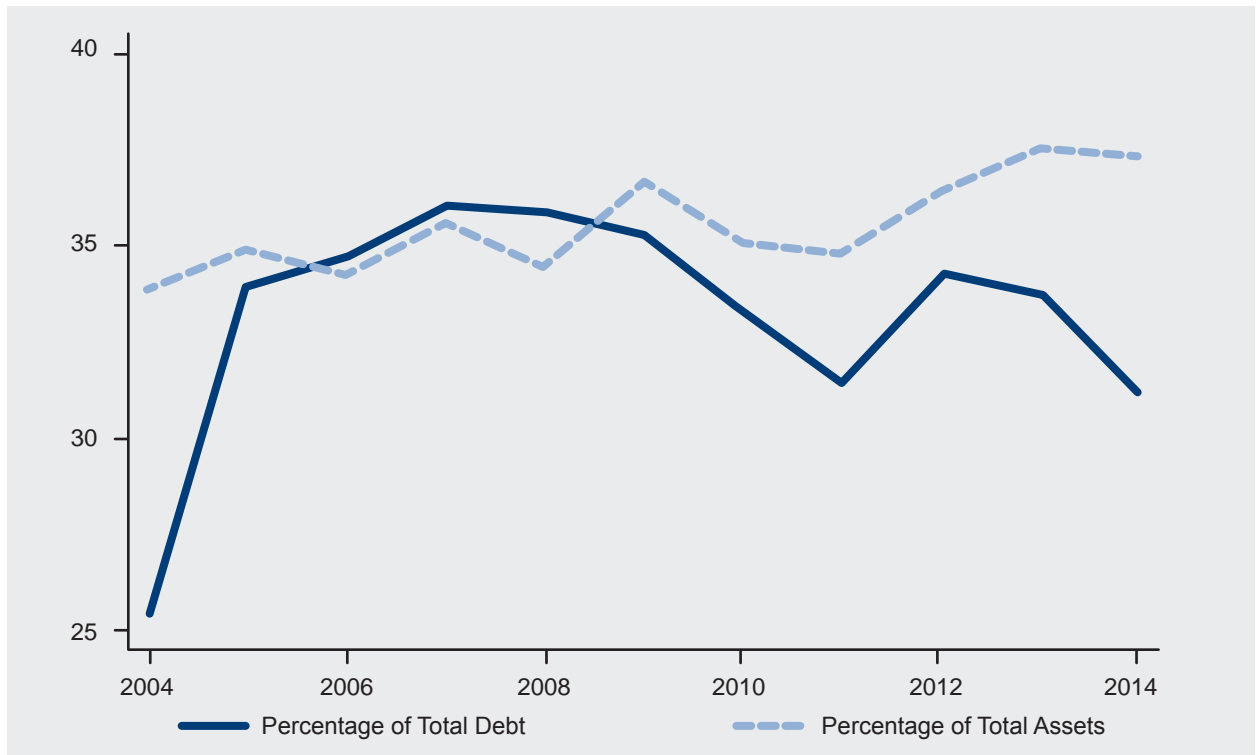
Note: Millions of U.S. dollars on left vertical axis. Average maturity in years on the right vertical axis.  
Source: RBI data.

**Table 5: Summary Statistics: Balance Sheet**

	N	Mean	Median	St. Dev.	P5	P95
Total Debt (bn INR)	4,868	19.65	2.91	85.330	0.110	65.56
Long-Term Debt (bn INR)	4,868	16.41	1.72	76.190	0.020	55.02
Foreign Currency Debt (bn INR)	2,819	6.608	1.103	21.421	0.032	23.548
Long-Term Debt/Total Debt	4,858	0.662	0.705	0.269	0.110	1.000
Foreign Currency Debt/Total Debt	2,814	0.338	0.28	0.262	0.015	0.879
Foreign Currency Debt/Total Assets	2,819	0.116	0.089	0.105	0.004	0.318
Debt/Assets	4,868	0.356	0.352	0.196	0.050	0.661

Source and note: These are summary statistics on the Balance Sheet of 468 firms that appear both in Prowess and in the RBI Data. The foreign currency borrowing is from Prowess. The sample period covers fiscal year-ends between is January 2004 to December 2014.

**Figure 14: Ratios of Foreign Debt to Total Debt and Debt to Assets**



Note: Percentage on vertical axis.  
Source: Based on Prowess Data.

Turning to our statistical analysis, we obtain a market-based measure of foreign exchange risk and estimate the following market model separately for each firm:

$$r_{it} = \alpha + \beta_M r_{Mt} + \beta_{FX} r_{FXt} + \varepsilon_i \quad (1)$$

where  $r_{it}$  is the return for firm  $i$  on day  $t$ ;  $r_{Mt}$  represents the return on the broader Indian stock



market, which is proxied by the NIFTY index return; and  $r_{FXt}$  is the USDINR daily return and is defined as  $(P_t - P_{t-1})/P_{t-1}$  where  $P_t$  is the number of INR required to buy \$1 at the end of period  $t$ . The model is estimated using OLS with an estimation window of 75 trading days, allowing us to obtain rolling estimates of  $\beta_{FX}$  for each firm.

Table 6 is a sorted list of the 20 firms with the highest average  $\beta_{FX}$  over our sample period. The firms not only belong to a variety of industries, but also vary greatly in their leverage ratio, foreign debt ratio, and frequency of external borrowing.

**Table 6: Biggest Daily FX  $\beta$  Firms**

Company Name	FX $\beta$	NIFTY $\beta$	Foreign/ Total Debt	Debt/ Assets	No. of ECB issuance	Avg. Amt. (US\$ mn)	Avg. Maturity
Ajanta Pharma Ltd.	0.552	0.806	0.332	0.344	1	5.92	5
Prakash Industries Ltd.	0.52	1.05	0.461	0.435	2	39.711	5
Rolta India Ltd.	0.502	1.111	0.756	0.327	7	46.328	6.905
Shree Ashtavinayak Cine Vision Ltd.	0.484	0.724	0.359	0.303	1	29.104	5.583
Supreme Petrochem Ltd.	0.482	0.746	0.2	0.209	1	8.054	6.083
Suryajyoti Spinning Mills Ltd.	0.482	0.69	0.159	0.617	2	6.3	5.625
Aksh Optifibre Ltd.	0.447	0.733	0.625	0.266	5	7.809	4.267
Wipro Ltd.	0.407	0.982	0.289	0.104	2	188.536	5.083
S Kumars Nationwide Ltd.	0.405	1.177	0.049	0.634	2	38.661	5.958
Jagran Prakashan Ltd.	0.4	0.496	0.243	0.208	3	7.138	4.833
Paramount Communications Ltd.	0.399	0.736	0.271	0.529	2	15.473	5
Micro Inks Pvt. Ltd.	0.389	0.643	0.802	0.205	10	5.799	3.75
Eveready Industries (India) Ltd.	0.372	0.88	0.324	0.294	1	22.179	7
Hi-Tech Gears Ltd.	0.361	0.749	0.436	0.302	4	3.208	5.375
Kanoria Chemicals Inds. Ltd.	0.357	0.584	0.257	0.382	2	14.227	6.042
Hitachi Home Life Solutions (India) Ltd.	0.352	0.819	0.734	0.188	3	6.393	4.333
Karur K C P Packagings Ltd.	0.329	0.496	0.195	0.549	1	8.97	5
Glenmark Pharmaceuticals Ltd.	0.323	0.636	0.403	0.323	4	25.976	5.021
Micro Technologies (India) Ltd.	0.318	0.677	0.447	0.202	1	12.64	5.417

Note: Among firms with at least 200 days of daily FX  $\beta$  as well as five years of data on foreign borrowing, these 20 firms have the highest average FX  $\beta$ .

To sharpen our conclusions, we turn an event study based on statements made about the probability of the tapering of the U.S. Federal Reserve's quantitative easing (QE) program as proxies for shocks to foreign exchange volatility. In particular, we investigate the differences in the impact of these statements on the returns of firms that are differentially exposed to market-based measures of foreign exchange risk as well as with varying debt capacity. To clearly identify the effect,

we focus on three distinct events that market participants identify as having significantly altered the probability of tapering:

- May 22, 2013: In a testimony to the Joint Economic Committee of the U.S. Congress, then-Federal Reserve Chairman Ben Bernanke suggested that tapering could begin after the next couple of meetings of the Federal Open Market Committee.<sup>32</sup>
- June 19, 2013: In a press conference following the Federal Open Market Committee meeting, Chairman Bernanke again suggested that asset purchases would be reduced later in 2013.<sup>33</sup>
- September 18, 2013: After the FOMC meeting, Chairman Bernanke unexpectedly announced that the Fed was going to delay tapering until economic conditions improved.<sup>34</sup>

We consider the first two dates as having increased the probability of tapering while the third decreased the probability. With respect to each of the event dates, we estimate the market model over a 150 trading day window starting at  $t=-155$  and ending at  $t=-6$ , where  $t=0$  captures the event date. The estimated market and FX  $\beta$ 's are used to predict returns around the event date. The abnormal return on a particular date is the difference between the actual and predicted return. We focus on the cumulative abnormal return (CAR) on the first five trading days following the event (CAR[1,5]). The actual event date is not included since the Indian market was closed by the time the relevant statements were made on those days.

To study the difference in the impact on firms with a different degree of foreign exchange exposure, firms are split into terciles based on their estimated  $\beta_{FX}$  or the ratio of foreign borrowing to total debt or assets. The CAR is then regressed on indicator variables for each tercile.

Our first set of results is summarized in Table 7, which reports the event study analysis related to the tapering of the Fed's quantitative easing. In the first panel, the firms are sorted based on the estimated  $\beta_{FX}$ , while in the second and third panel they are sorted on the basis of the ratio of foreign debt to total debt and assets, respectively.

The top panel of Table 7 suggests that the abnormal reaction post event is sharpest for the firms with high  $\beta_{FX}$ . On all three dates, the difference in reaction between high and low  $\beta_{FX}$  is statistically significant. For instance, over the five days following June 19, 2013, the cumulative abnormal return for high  $\beta_{FX}$  firms was 2.5 percent points greater than that for the low  $\beta_{FX}$  firms. This difference is statistically significant at the 1 percent level. High  $\beta_{FX}$  firms see the sharpest negative reaction on news of taper. This is non-obvious, since the movement in stock price due to the exchange rate change is already accounted for in the predicted return.

In contrast, the other two panels suggest that the proportion of foreign borrowing does not explain differences in abnormal reaction. Following an increase in probability of tapering, there is a significant negative abnormal reaction, but the difference between borrowers with a high fraction

<sup>32</sup> See: <http://www.marketwatch.com/story/bernanke-premature-tightening-could-end-growth-2013-05-22>

<sup>33</sup> See: <https://research.stlouisfed.org/publications/es/article/10036>

<sup>34</sup> See: <http://www.bloomberg.com/news/articles/2013-09-18/fed-refrains-from-qe-taper-keeps-bond-buying-at-85-bln>

**Table 7: Abnormal Returns around Taper Talk (FX  $\beta$  and Foreign Exchange Borrowing)**

	CAR [1,5]		
	05/22/13	06/19/13	09/18/13
Lo FX $\beta$	-0.456 (0.437)	-1.010* (0.597)	-0.059 (0.583)
Mid FX $\beta$	-0.952** (0.471)	-2.879*** (0.543)	0.233 (0.518)
Hi FX $\beta$	-1.860*** (0.487)	-3.499*** (0.473)	2.097*** (0.484)
Pr(Hi-Lo==0)	0.0328	0.0011	0.0048
Observations	435	433	428
R2	0.047	0.147	0.036

	CAR [1,5]		
	05/22/13	06/19/13	09/18/13
Lo Foreign/Total Debt	-1.396** (0.553)	-3.449*** (0.641)	-0.400 (0.596)
Mid Foreign/Total Debt	-1.343** (0.523)	-3.274*** (0.746)	1.204* (0.669)
Hi Foreign/Total Debt	-0.818* (0.463)	-2.204*** (0.487)	0.527 (0.564)
Pr(Hi-Lo==0)	0.4236	0.1212	0.2598
Observations	290	284	286
R2	0.055	0.196	0.018

	CAR [1,5]		
	05/22/13	06/19/13	09/18/13
Lo Foreign Debt/Total Assets	-1.095** (0.527)	-2.875*** (0.583)	0.147 (0.531)
Mid Foreign Debt/Total Assets	-1.311** (0.541)	-3.429*** (0.696)	1.495** (0.643)
Hi Foreign Debt/Total Assets	-1.083** (0.462)	-2.502*** (0.605)	-0.27 (0.64)
Pr(Hi-Lo==0)	0.9866	0.658	0.6158
Observations	292	286	288
R2	0.051	0.19	0.022

Note: The sample consists of 442 companies which are present in the RBI data and for which return data is available to estimate the model. A multivariate market model is used for estimation with the NIFTY return proxying for the market return while USDINR return proxies for FX return. The estimation window is 180 calendar days and ends five calendar days before the announcement date. Cumulative abnormal return is calculated over five trading days post the event date. May 22, 2013 and June 19, 2013 are dates on which likelihood of tapering went up while September 18, 2013 is one which the likelihood went down. The returns are in percentage points. In the first panel, firms are sorted into terciles based on their estimated FX  $\beta$ , while in the second, they are sorted on the ratio of their foreign borrowing to their total debt at the end of the previous fiscal year. In the third panel, they are sorted on the basis of the ratio of their foreign borrowing to their total assets at the end of the previous fiscal year. Robust standard errors are in brackets. \*\*\*, \*\*, \* denote significance at 1, 5, and 10 percent levels.

of foreign debt and those with a low fraction is not statistically significant. Together, the results from Table 7 provide support for our second hypothesis: Market-based measures of foreign exchange risk better capture firm vulnerability than balance sheet measures.

Table 8 reports results from double sorting firms based on their  $\beta_{FX}$  and balance sheet ratios of foreign borrowing. Each firm is placed in one of nine groups based on the tercile of  $\beta_{FX}$  and the tercile of foreign borrowing. In the first panel, the ratio used is foreign debt to total borrowing while in the second it is foreign debt to assets. The first column of both panels shows that, following the May 22, 2013 event, within high  $\beta_{FX}$  firms, those with a high fraction of foreign borrowing had a higher abnormal negative reaction than those with lower foreign borrowing. Though the magnitude is about 1.3 percentage points, the difference is not statistically significant. Similarly, following June 19, 2013, although the difference between firms with high foreign borrowing to assets and low foreign borrowing to assets within high  $\beta_{FX}$  firms is above 1 percent (second panel), the difference is not statistically significant. Although the magnitudes suggest some support for the third hypothesis, it is not conclusive.

Turning to policy implications, ECBs as a proportion of Indian external debt are likely to continue growing. With a persistent interest rate differential between India and advanced economies, large Indian conglomerates such as Reliance and Essar are undertaking the process to dollarize

**Table 8: Abnormal Returns around Taper Talk (Double Sorts)**

	CAR [1,5]				CAR [1,5]		
	05/22/13	06/19/13	09/18/13		05/22/13	06/19/13	09/18/13
L $\beta$ -L Ratio	-1.380* (0.706)	-2.287** (1.021)	-0.448 (1.223)	L $\beta$ -L Ratio	-0.502 (0.617)	-2.207** (1.088)	0.161 (1.194)
L $\beta$ -M Ratio	0.119 (1.007)	-0.908 (0.942)	0.345 (1.353)	L $\beta$ -M Ratio	-0.823 (1.049)	-0.558 (0.767)	2.325* (1.399)
L $\beta$ -H Ratio	0.552 (0.615)	-0.72 (0.946)	-0.173 (1.187)	L $\beta$ -H Ratio	0.398 (0.497)	-1.312 (1.044)	-2.561** (1.027)
M $\beta$ -L Ratio	-1.861*** (0.671)	-3.758*** (1.082)	-1.134 (0.895)	M $\beta$ -L Ratio	-1.632** (0.734)	-2.776*** (0.995)	-0.245 (0.647)
M $\beta$ -M Ratio	-1.04 (0.744)	-4.231*** (1.561)	1.131 (1.27)	M $\beta$ -M Ratio	-0.904 (0.742)	-5.229*** (1.467)	-0.643 (0.96)
M $\beta$ -H Ratio	-0.596 (0.805)	-2.152** (0.871)	0.631 (0.586)	M $\beta$ -H Ratio	-0.887 (0.789)	-1.770** (0.871)	1.459 (1.026)
H $\beta$ -L Ratio	-0.965 (1.407)	-4.874*** (1.243)	0.558 (0.881)	H $\beta$ -L Ratio	-1.158 (1.179)	-3.640*** (0.956)	0.666 (0.857)
H $\beta$ -M Ratio	-2.799*** (0.957)	-4.297*** (1.091)	2.020** (0.885)	H $\beta$ -M Ratio	-2.476** (1.086)	-4.019*** (0.706)	2.601*** (0.857)
H $\beta$ -H Ratio	-2.328*** (0.855)	-3.653*** (0.634)	1.351 (1.232)	H $\beta$ -H Ratio	-2.466*** (0.900)	-4.648*** (1.175)	0.68 (1.175)
Observations	290	284	286	Observations	292	286	288
R <sup>2</sup>	0.09	0.23	0.03	R <sup>2</sup>	0.077	0.236	0.072

Note: The first panel has double sorts based on FX  $\beta$  and the ratio of foreign exchange borrowing to total debt. The second panel has double sorts based on FX  $\beta$  and the ratio of foreign exchange borrowing to total assets. \*\*\*, \*\*, \* denote significance at 1, 5, and 10 percent levels.

their debt to the extent possible.<sup>35</sup> Occasionally, these borrowings are guaranteed by local banks through instruments like standby letters of credit (SLBC). In the prevailing environment, policy-makers need to be conscious of risks arising from heightened foreign exchange volatility. Whether it be due to changes in the stance of U.S. monetary policy or due to shocks to the current account balance, sharp adverse movements in the exchange rate might hinder corporates from rolling over their debt and lead to real economic distress. In cases where the debt is guaranteed by local banks, the shock could even infect the domestic banking system.

Our analyses suggest steps that policymakers could take to better recognize risks and mitigate the consequences of adverse shocks. First, rather than focusing on balance sheet measures of foreign exposure, we make the case for an increased reliance on market-based metrics (such as FX  $\beta$ ) to identify firms that could potentially encounter trouble in the event of a foreign exchange shock. Of course, market-based measures would be unavailable for non-listed firms but, even then, the broader takeaway is that hedging activity, either natural or through derivatives, needs to be taken into account before judging the susceptibility of an external commercial borrower to foreign exchange rate movements. Second, risks to the banking system should be taken into account. A potential intervention could be to raise the risk weights (or lower concentration limits) for bank assets associated with firms with high foreign exchange risk. In addition, limits could be enhanced on off-balance sheet guarantees to firms that are susceptible to foreign exchange risk. Currently, any ECBs with guarantees need prior approval. The approval process could be made more stringent for firms identified as risky based on market measures.

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<sup>35</sup> For instance, see the *Financial Times* article (10th February 2013) on the debt strategy followed by Essar (<http://www.ft.com/intl/cms/s/0/323daea2-739c-11e2-9e92-00144feabdco.html>).

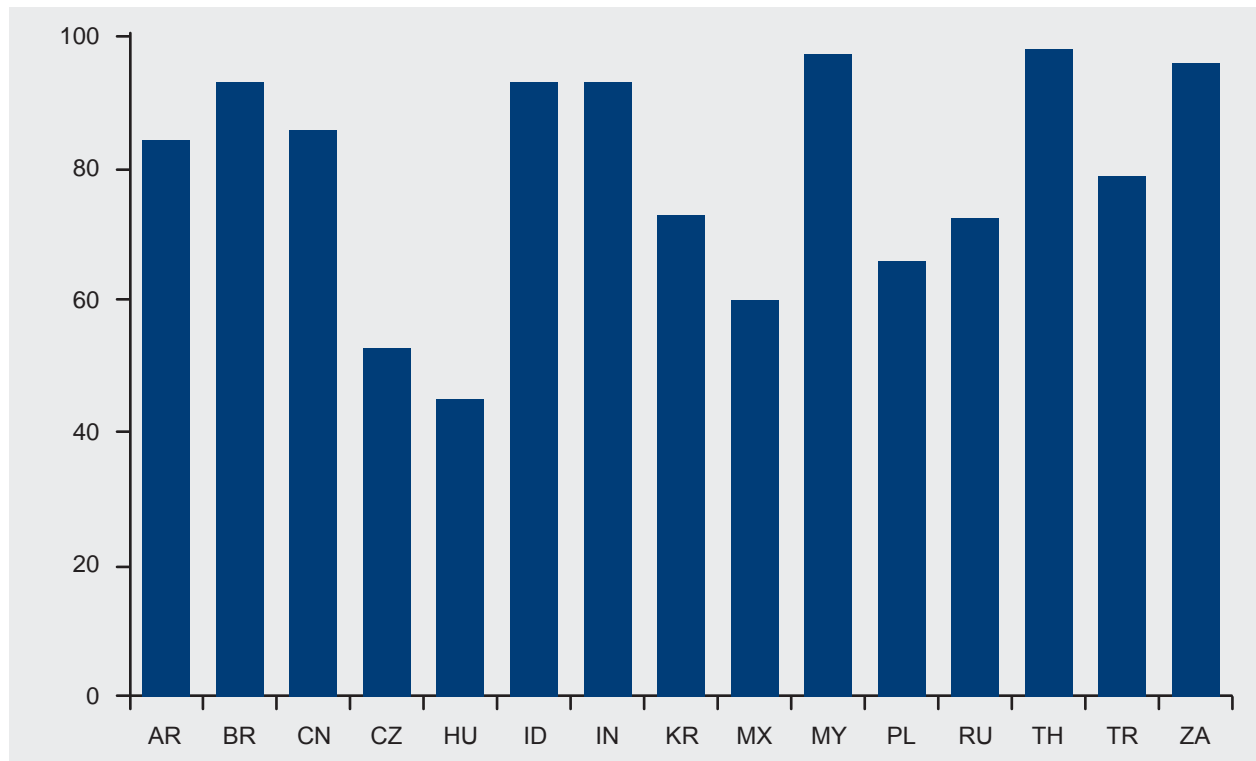
### 3. Case Study II

#### The Intermediation of Corporate Debt Through the Domestic Banking System in Turkey

As argued by Chui et al. (2014), there is an increasing tendency among EM corporates to borrow in foreign currency in international financial markets. In spite of this trend, the bulk of domestic private credit provision stays in the hand of domestic banks, as shown in Figure 15.

This section focuses on the case of Turkey where 80 percent of the borrowing by corporates is from domestic banks. Figure 16 shows that the share of private sector credit provided by banks declined during early 2000s given the financial crisis but it is now back up to almost 90 percent. Of course, as argued by Chui et al. (2014), there is also an increase in private sector debt provided by non-banks via direct international capital market access as shown in Figure 17 (in billions of U.S. dollars).

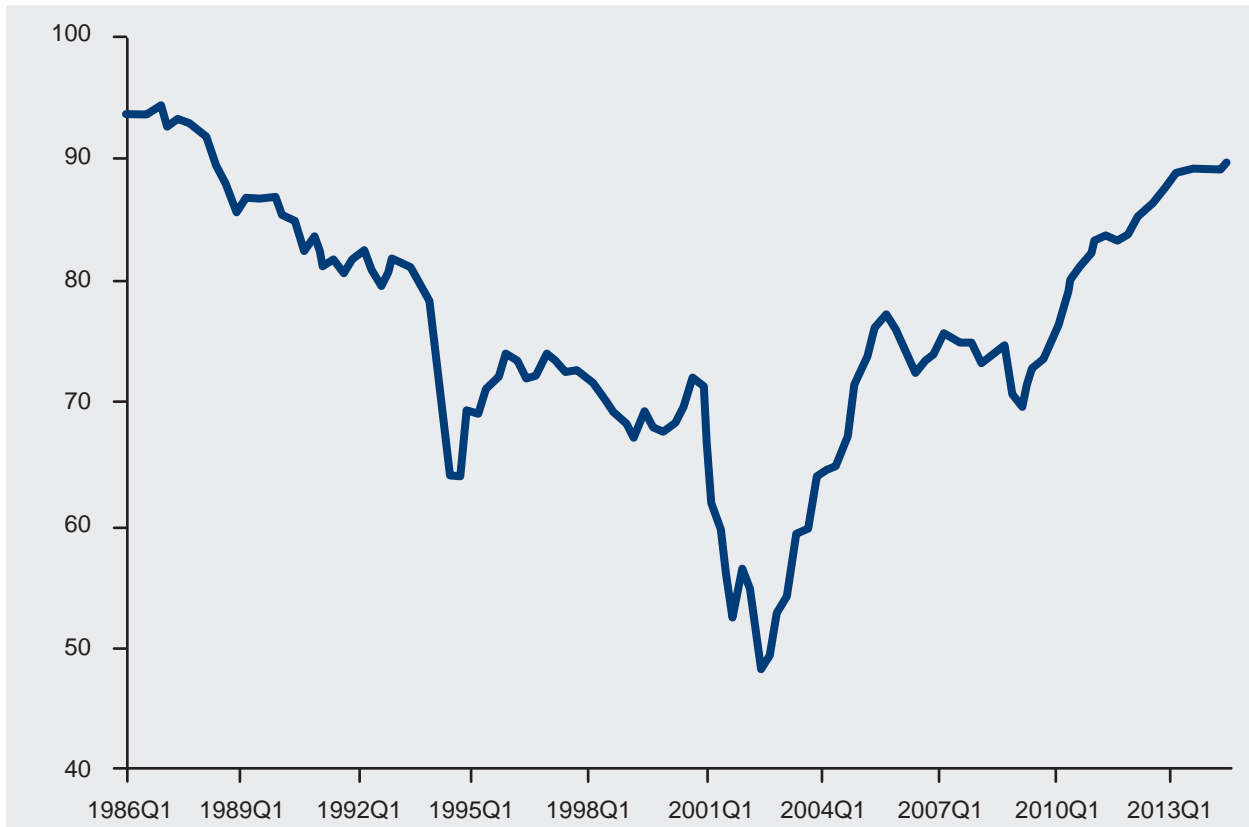
**Figure 15: Share of Domestic Bank Lending in Total Credit Provision in Emerging Markets**



Note: Values (in percent) on vertical axis refer to the country average (2006-2013) of the share of lending from domestic banks to borrowers in private nonfinancial sector over lending from all creditors to borrowers in the private nonfinancial sector. The full country list can be found in the Data Appendix.

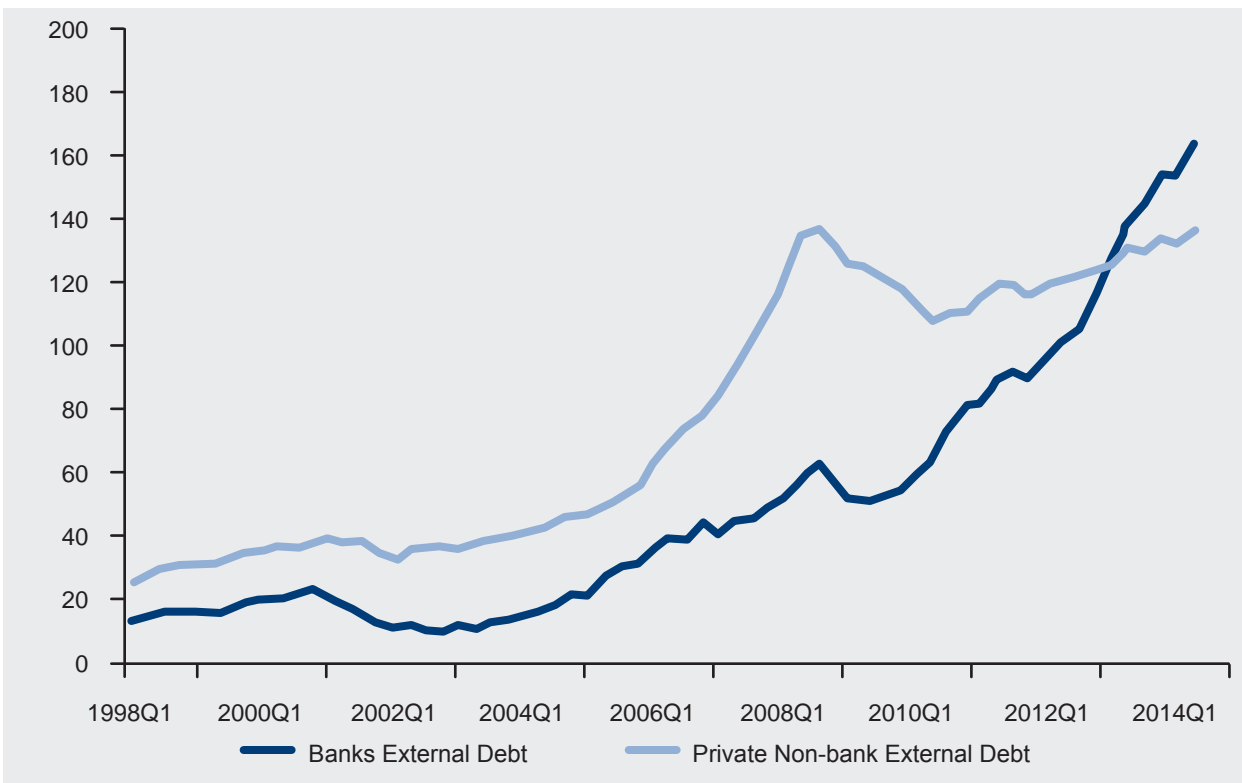
Source: Bank for International Settlements (Credit to the Private Sector dataset). Adapted from Hardy (2015).

**Figure 16: Share of Domestic Bank Lending in Total Credit Provision in Turkey**



Note: Domestic bank share (in percent) of credit to private sector on vertical axis.  
Source: Bank for International Settlements.

**Figure 17: Bank and Non-Bank External Debt in Turkey**



Note: Billions of U.S. dollars on vertical axis.  
Source: Bank for International Settlements (External Debt Statistics).

As we have argued in the introduction, it is important to understand the role of global liquidity when we want to focus on foreign currency borrowing by EM corporates. As shown by Baskaya, di Giovanni, Kalemlı-Özcan, Peydro, and Ulu (2015), there is a direct link between global liquidity and capital flows and domestic credit boom in Turkey. As Hardy (2015) shows, when global liquidity is abundant, it is feasible that corporates themselves can borrow directly and easily in the markets, bypassing the domestic banking system. When the conditions are tight, this situation might reverse, where banks become the sole source of foreign currency lending to corporates. In fact, as seen in Figure 18 taken from Hardy (2015), there is a positive correlation between VIX and the share of foreign currency loans in the domestic credit provided by banks on average, when we look at a group of emerging economies composed of Argentina, Brazil, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Hungary, Indonesia, Israel, Latvia, Lithuania, Mexico, Poland, South Africa, Turkey, and Ukraine.

**Figure 18: Global Liquidity and FX Lending in Emerging Markets**



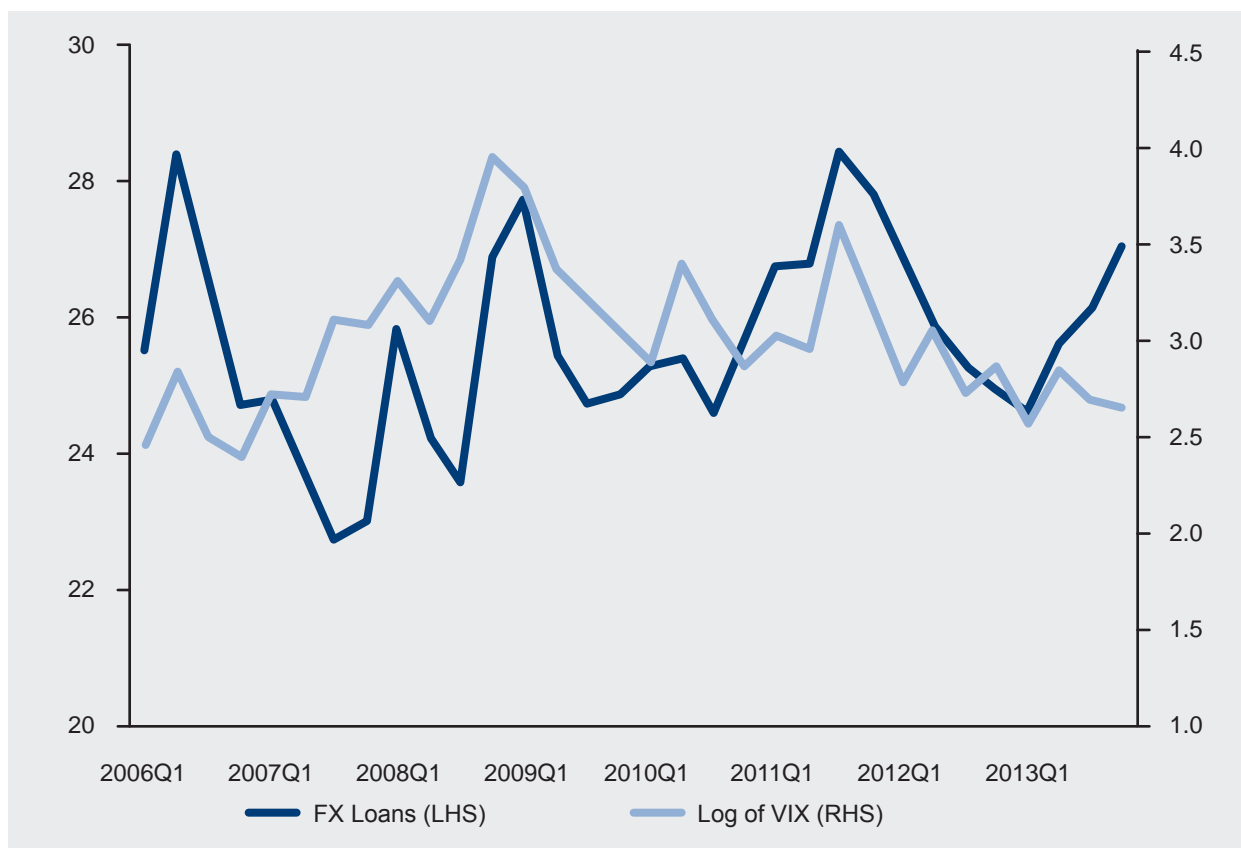
Note: FX loan as percent of total loan on left vertical axis. Log of VIX index on right vertical axis. Average FX loans is foreign currency share of outstanding loans by domestic banks averaged for all countries.

Source: Hardy (2015).



Figure 19 shows the same pattern for Turkey. Figures 18-19 plot the share of foreign currency loans in total loans. The data are from the IMF where they calculate the share of foreign currency loans in total loans by using the foreign currency and the foreign-currency-linked part of gross loans to residents and nonresidents as the numerator and total gross loans as the denominator. It is an asset quality indicator, which measures the relative size of foreign currency loans within gross loans and therefore monitors exposures to both credit and currency risk.

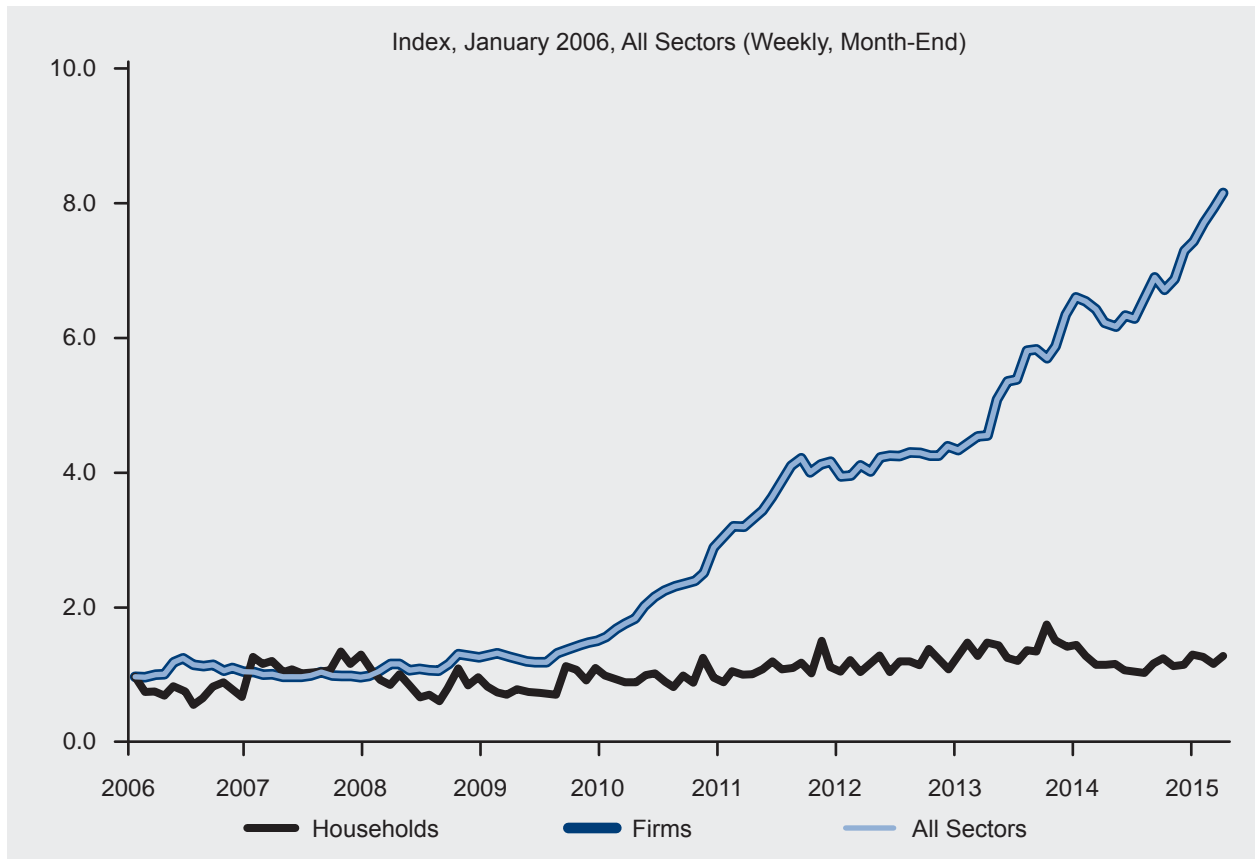
**Figure 19: Global Liquidity and FX Lending in Turkey**



Note: FX loan as percent of total loan on left vertical axis. Log of VIX index on right vertical axis. FX loans is foreign currency share of outstanding loans by domestic banks.  
Source: Hardy (2015).

Using publicly available data from the Central Bank of Turkey (CBRT) website, Figure 20 shows that loans in foreign currency increased eightfold in the economy, driven by loans to firms and not loans to households. However, when we look at the share of foreign currency loans in total loans (as shown in Figure 21) this is only a 50 percent increase. This development means that the increase in FX loans is part of a general credit boom. The figures are normalized to unity at the beginning of the sample to make the interpretation easier. In terms of magnitudes, the share of foreign currency loans in total loans is 52 percent on average. As opposed to the IMF data shown in Figures 18-19, CBRT data is only on loans to the domestic nonfinancial sector.

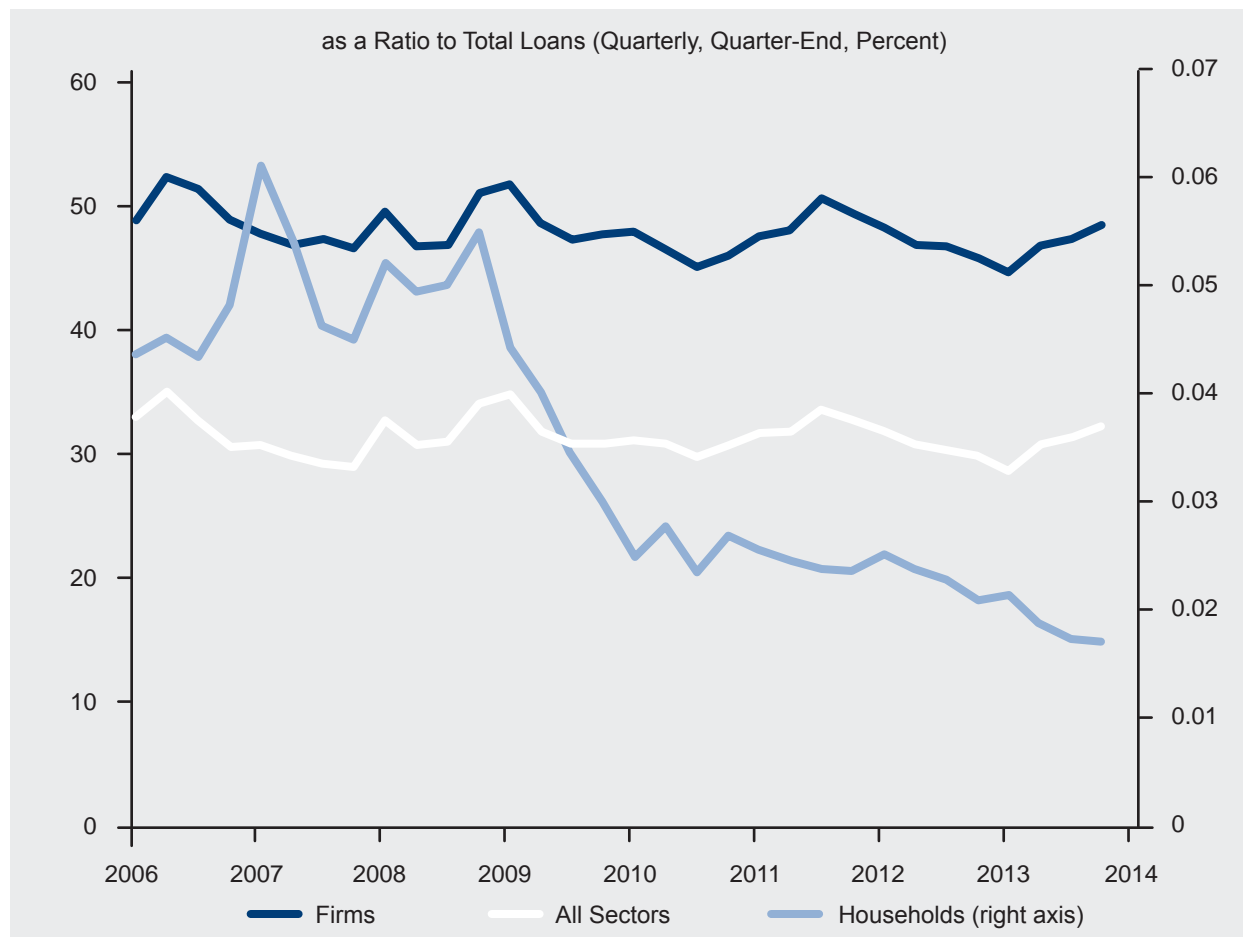
**Figure 20: Growth of FX Lending in Turkey: Loans in Foreign Currency**



Note: These are based on weekly transactions data. Household corresponds to consumer loans and individual credit cards. Firm loans are the difference in total lending to the nonfinancial sector minus loans to households. Index, 2006:1.

Source: CBRT Weekly Banks' and Finance Companies' Selected Loans and Banking Sector Credit Volume.

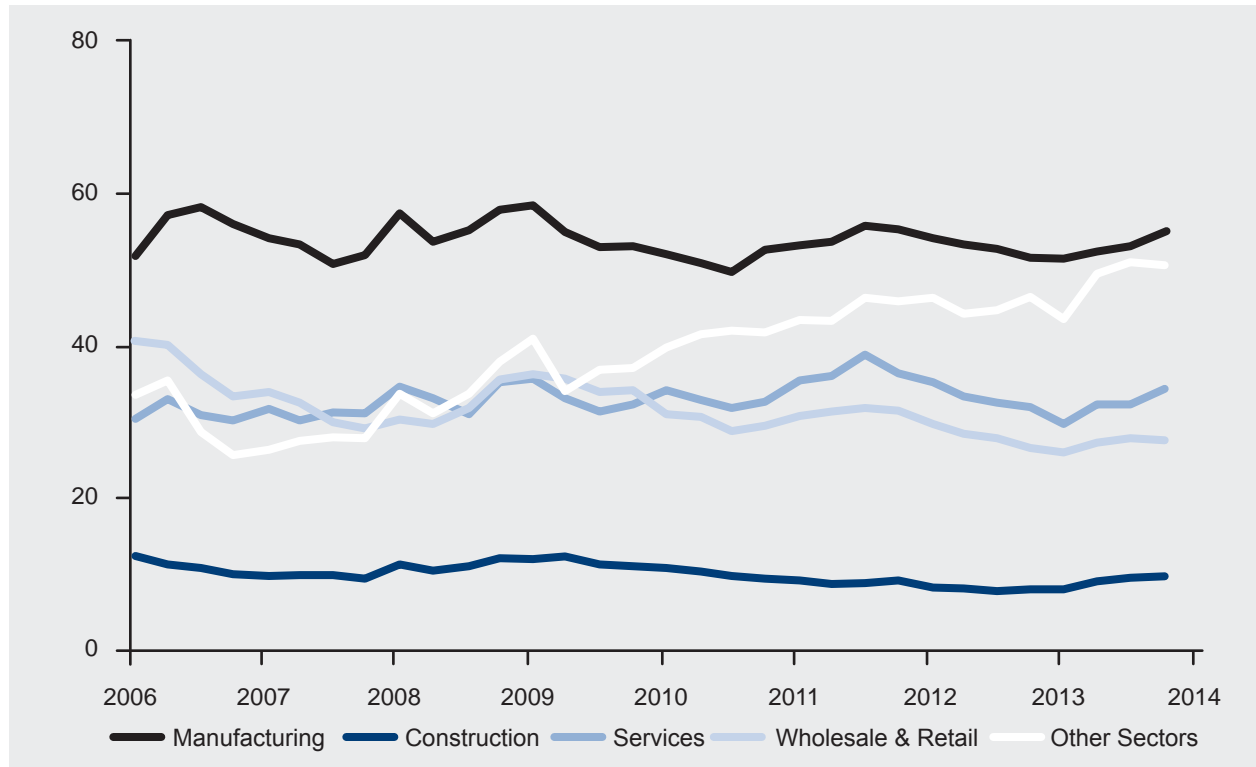
**Figure 21: Percent of FX Lending in Total Lending in Turkey: Share of Loans in Foreign Currency**



Note: Percent of FX lending on vertical axis.

Source: Baskaya et al. (2015). Aggregated Data from Credit Registry.

Figure 22 shows the same relationships using aggregated micro-level data from Baskaya et al. (2015). This data is loan level involving transactions among firms, households, and banks. The average share of foreign currency loans is 52 percent in this data too, matching the CBRT official flow of funds data. In terms of share of foreign currency loans in total loans there seems to be little change over time, implying similar growth rates of total loans and foreign currency loans. Hence, the increase in FX borrowing is part of a general credit boom provided by the ease in global liquidity conditions. CBRT data aggregate all loans (cash, credit card, trade credit, etc.) given by all banks and financial intermediaries, whereas micro-loan level data are on cash loans given by main deposit banks. The micro data helps us to look into the heterogeneity by sector. As shown in Figure 22, the share of foreign currency borrowing in several sectors has been pretty stable since 2006 where the highest share is in manufacturing.

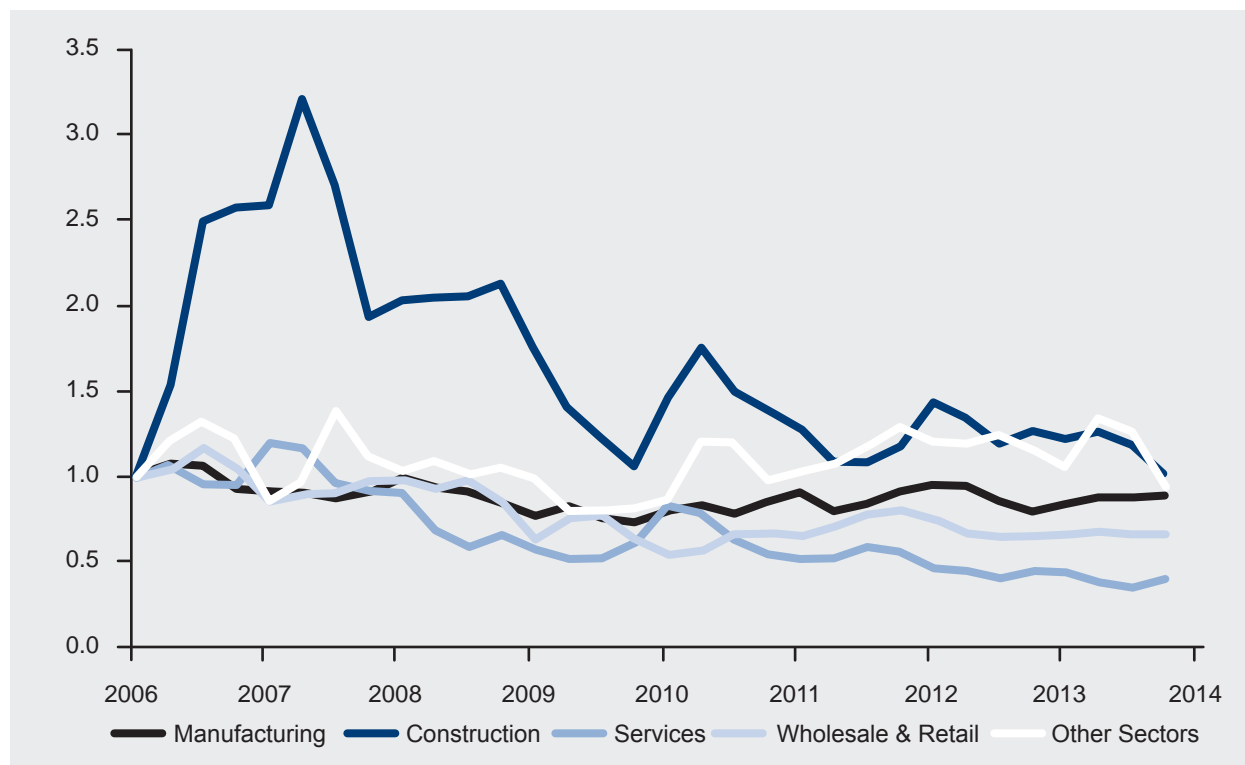
**Figure 22: Percent of FX Lending in Total Lending in Turkey: By Sector**

Note: FX lending as percent of total lending on vertical axis.  
Source: Baskaya et al. (2015).

So far we have looked at the stock of loans, i.e., credit outstanding. It is also important to investigate role of foreign currency borrowing in new issuance. Figure 23 shows that new loan issuance also has stable shares for foreign currency, implying that foreign currency borrowing increased at the same rate with the credit boom, with the exception of the construction sector's threefold increase before the global financial crisis. During last few years, the "other sectors" category seems to have the biggest increase. Given the higher risk posed by non-tradable sectors' foreign currency borrowing (and original threefold increase after 2006 in the construction sector), CBRT introduced a macroprudential policy on foreign currency borrowing in June 2009 that dictates that non-foreign currency earnings companies can borrow in foreign currency from local banks only for loans greater than \$5 million.<sup>36</sup>

<sup>36</sup> According to the policies introduced in June and September 2009, the rules are as follows: There are no restrictions on residents acquiring credits from abroad, provided that such credits are disbursed by means of banks. Residents may obtain foreign exchange credits from domestic banks only under the following conditions: a) commodity credits (in accordance with export and import regimes), b) credits for foreign exchange-earning activities (exports, tourism firms, etc.), c) credits with an average maturity exceeding one year and with an amount no less than \$5 million, d) commercial and professional credits (for those who have the required amount of foreign exchange receivables), and e) residents (real persons) are not allowed to obtain foreign exchange or foreign exchange-indexed consumer credits (including mortgages). Prior to June 2009, the use of foreign exchange credits was not allowed, but residents were able to obtain foreign exchange-indexed credits.

**Figure 23: Growth in the Share of FX Lending in Total Lending in Turkey: By Sector New Issuance (Share of New Loans in Foreign Currency)**



Note: Index, 2006:1.  
 Source: Baskaya et al. (2015).

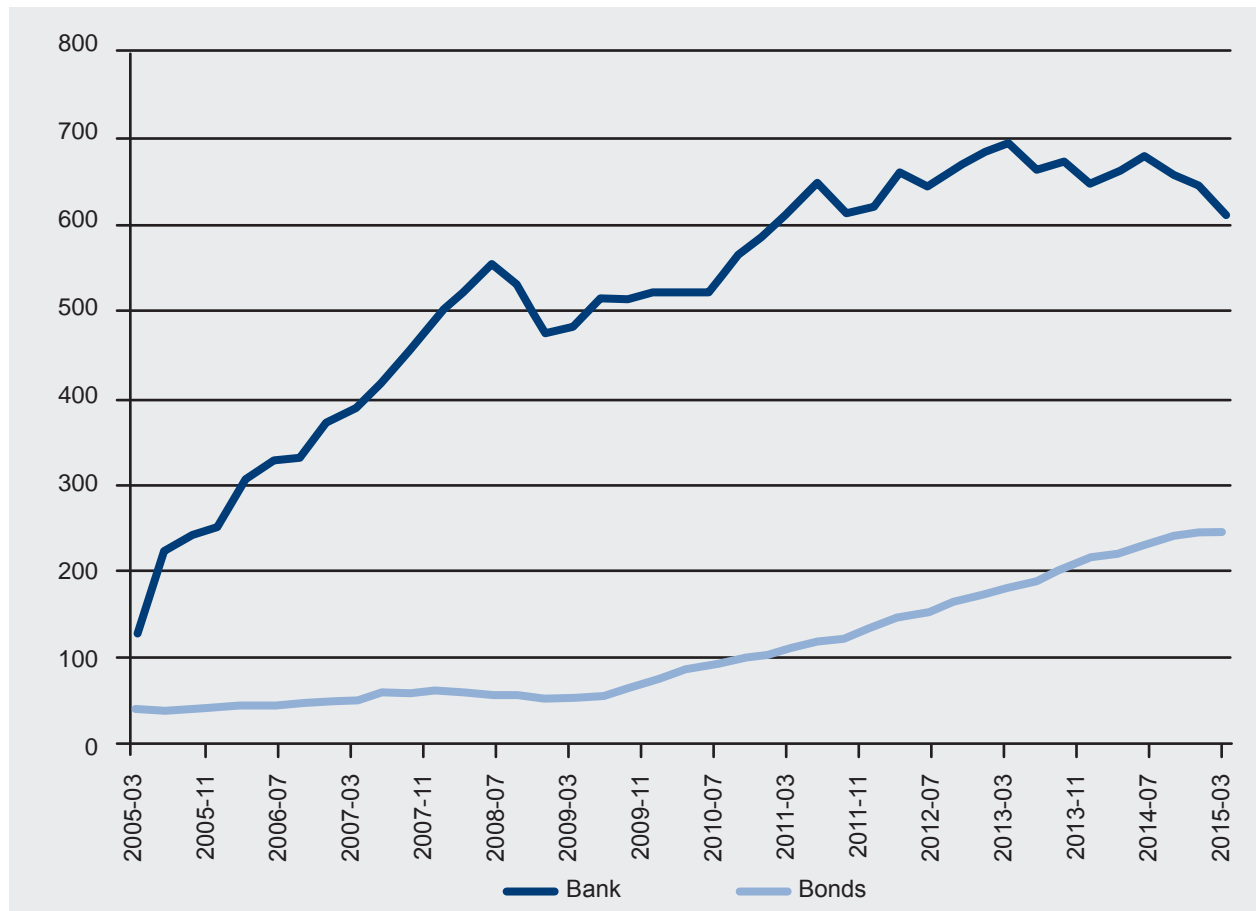
Baskaya, di Giovanni, Kalemli-Özcan, Peydro, and Ulu (2015) showed that a domestic credit cycle that moves with the VIX became less sensitive to the VIX after this policy intervention and many other macroprudential policies implemented during 2009-2010. The policy message is that ex-ante macroprudential policies can indeed have a role in dampening the risk-taking in the corporate sector.

## 4. Case Study III

### Corporate Bond Issuance in Latin America

Claims of BIS reporting banks on the non-bank Latin American private sector on an ultimate risk basis peaked at \$690 billion in March 2013 and were down to \$610 billion by March 2015—about the same level they were in March 2010. However, over the same period, bond issuances of non-financial corporations headquartered in Latin America and the Caribbean (LAC) kept growing. As shown in Figure 24, the outstanding stock of external bonds of LAC nonfinancial corporations went from \$83 billion in March 2010, to \$180 billion in March 2013, to \$245 billion in March 2015—an increase by a factor of three in five years. Before the crisis, most international borrowing by local corporations was increasingly financed by foreign banks. Since then, foreign bank credit has stabilized, and international bond issuance has gained prominence so that, at this writing, about one-third of total international corporate borrowing is accounted for by bonds.

**Figure 24: Outstanding International Bonds and Liabilities (LAC Countries, Excluding Offshore Centers)**



Note: Bank is consolidated foreign claims and other exposures of reporting banks—ultimate risk basis, non-bank private sector (Table 9C). Bonds are international debt securities—nonfinancial corporations, amounts outstanding (Table 12D). Billions of U.S. dollars on vertical axis.

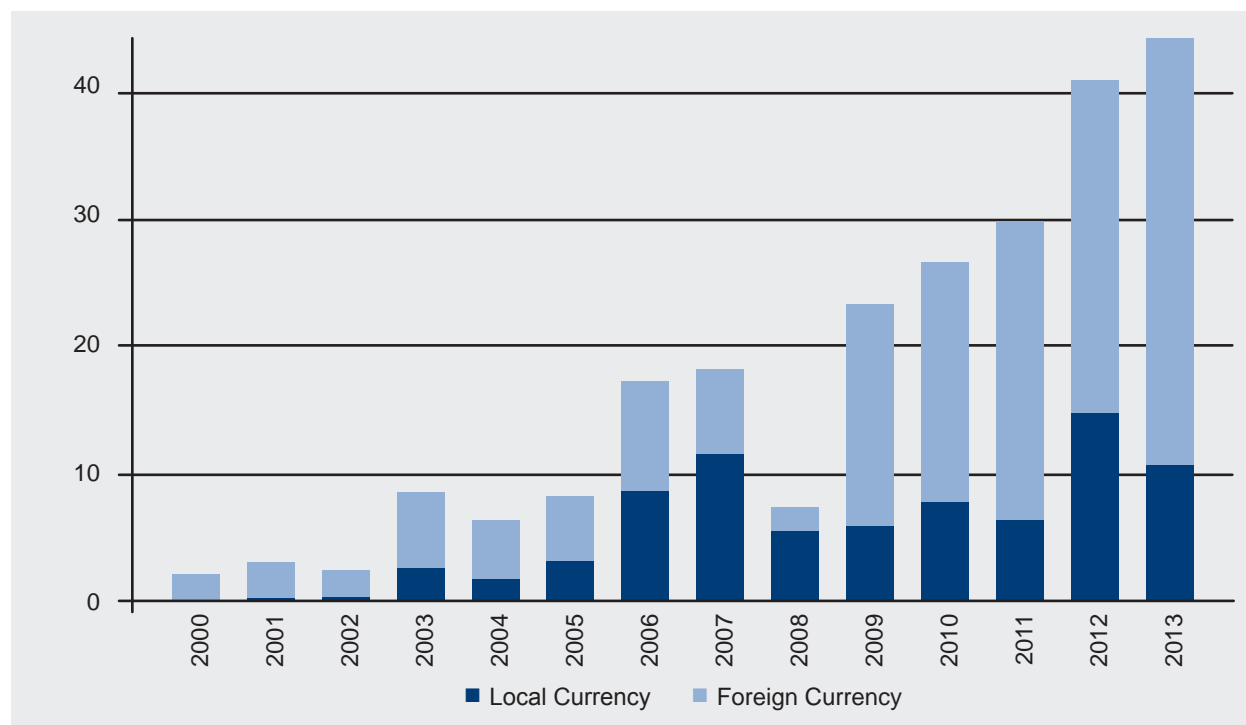
Source: BIS banking and securities statistics.

Powell (2014) shows that, in the cases of Brazil, Mexico, Chile, and Colombia, rapid domestic credit growth in these countries has gone hand-in-hand with external borrowing by nonfinancial corporations. He shows that there is a statistically significant correlation between external borrowing of Latin American (and Asian) nonfinancial corporations and domestic credit growth. This is a first indication that corporations in Latin America might be playing the role of financial intermediaries.

In more recent work, Caballero, Panizza, and Powell (2015) build on the work of Shin and Zhao (2013) and Bruno and Shin (2015b), asking why nonfinancial firms act as financial intermediaries. By matching international bond issuances with a sample of 766 firms from 18 emerging market countries, Caballero et al. (2015) corroborate Bruno and Shin’s (2015b) findings: Nonfinancial corporations based in emerging markets use the proceeds of external bond issuances to maintain cash or liquid assets when the conditions for pursuing carry trade activities are more attractive.<sup>37</sup>

Indeed, Caballero et al. (2015) show that this behavior is particularly important in the presence of capital controls, especially those on inflows. This finding is line with the intuition provided Shin and Zhao (2013) that, through their internal capital markets, nonfinancial corporations can circumvent capital controls. This activity appears to be particularly profitable when more regu-

**Figure 25: Domestic- and Foreign-currency Bond Issuances in LAC**



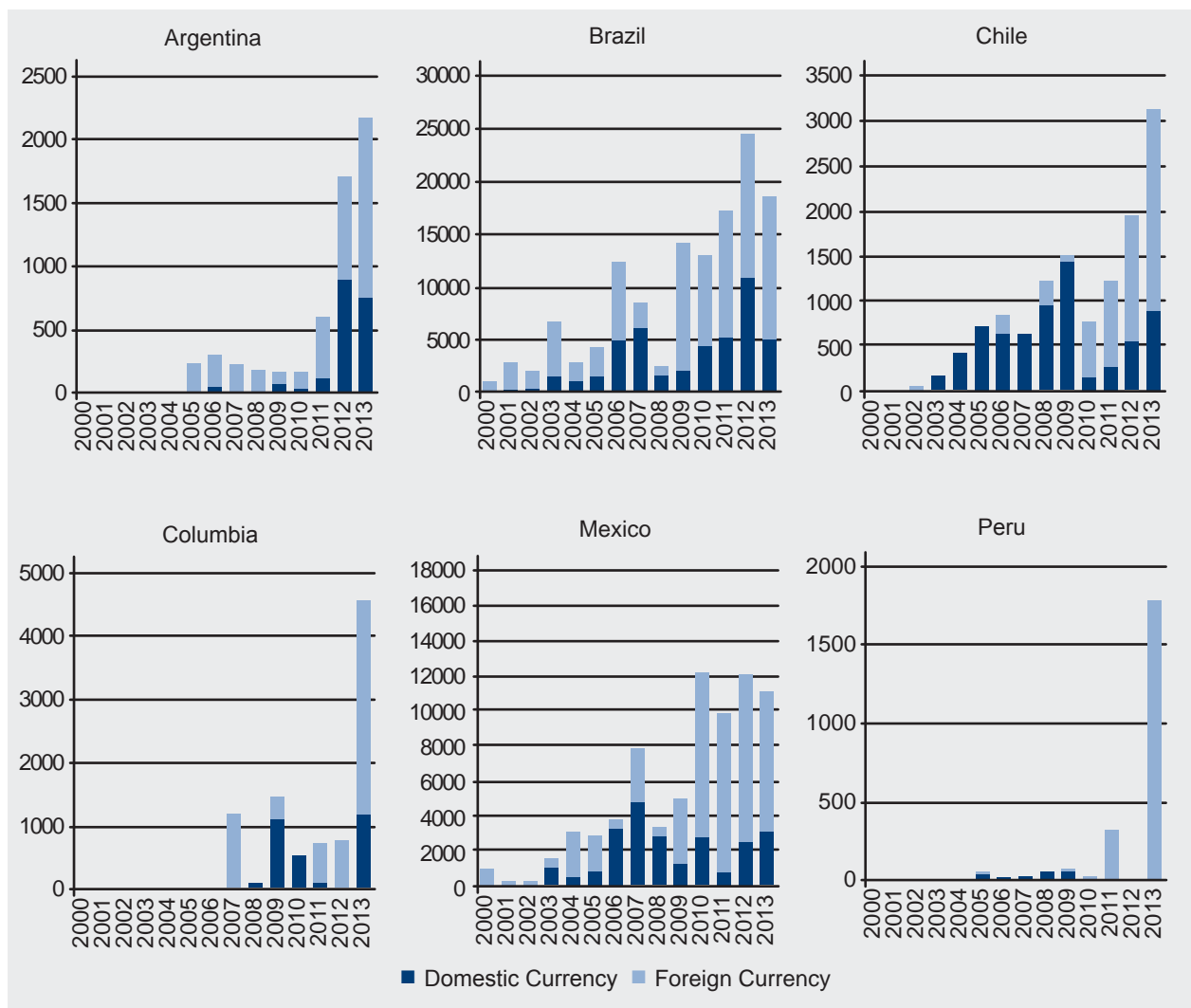
Note: Billions of U.S. dollars on vertical axis.  
Source: Own elaboration based on Dealogic data.

<sup>37</sup> The sample is a subset of the 50 largest listed nonfinancial firms in each country.

lated entities like banks are constrained to arbitrage away cross-country interest rate differentials. Thus, corporations—by acting as financial intermediaries—effectively engage in a carry trade.

Using a subset of 261 firms from Argentina, Brazil, Chile, Colombia, Mexico, and Peru, we reproduce the analysis reported in Caballero et al. (2015). In 2013, foreign bond issuances by the LAC firms included in this sample reached \$36 billion. That is roughly 3.5 times the \$10.5 billion in local bond issuances of these same firms during this period.<sup>38</sup> As we can see from Figure 25, the share of foreign currency bond issuances in total bond issuances in this sample of firms increased from 36 percent in 2007 to 76 percent in 2013. And, as we show in Figure 26, foreign currency bond issuances have increased in all six countries.

**Figure 26: Domestic- and Foreign-currency Bond Issuances in Individual Countries**



Note: Billions of U.S. dollars on vertical axis.  
Source: Own elaboration based on Dealogic data.

<sup>38</sup> Note that these are issuances, while Figure 24 reports the stock of outstanding bonds.



To obtain their result on the role of nonfinancial corporates as intermediaries, especially in the presence of capital inflow controls, Caballero et al. (2015) look at a simple regression. Their baseline model regresses log of cash holdings (scaled by sales) over firm-level foreign currency bond issuances interacted with capital account openness and the spread between the local currency deposit rate and borrowing costs in the U.S. (they also include a set of time-variant firm-specific controls). Specifically, they estimate the following equation:

$$\ln\left(\frac{C}{SA}\right)_{i,c,t} = FXB_{i,c,t} \left( \beta + \delta \widetilde{SP}_{c,t} + \eta K_{c,t} + \Phi(\widetilde{SP}_{c,t} K_{c,t}) \right) + X_{i,c,t} \Gamma + \alpha_i + \theta_{c,t} + \varepsilon_{i,c,t} \quad (2)$$

Where  $C$  represents cash holdings,  $SA$  is sales,  $FXB$  is foreign bond issuances,  $\widetilde{SP}$  is the demeaned spread, and  $K$  is a measure of capital account openness to inflows that ranges between 0 (closed capital account) and 1 (open capital account).<sup>39</sup> In this set-up,  $\beta$  captures the marginal effect of bond issuances on cash holding in the country-year with the average spread and a closed capital account ( $K=0$ );  $\beta+\eta$  captures the marginal effect of bond issuances on cash holding in the country-year with the average spread and no capital controls ( $K=1$ );  $\delta$  captures how spreads affect the marginal effect of bond issuances on cash holdings (a positive value is consistent with the presence of carry trade activities) in a country with a fully closed capital account; and  $\delta+\varphi$  captures how spreads affect the marginal effect of bond issuances on cash holdings in a country with a fully open capital account. In other words,  $\varphi$  measures how capital account openness changes the incentives for corporations to engage in carry trade activities for a given degree of capital account openness.

If the model is estimated without interactions,  $\beta$  instead captures the marginal effect of bond issuances on cash holding in the country-year with the average spread and the average level of capital account openness. Table 9 shows that  $\beta$  is positive (consistent with firms behaving like financial intermediaries), but rarely statistically significant.

Table 10 reports results allowing for the interaction between bond issuances and the demeaned spread. The coefficient  $\beta$  remains positive and often insignificant, and  $\delta$  is positive and significant in two of three regressions. We interpret this result as evidence that nonfinancial firms located in country-years with average capital account openness tend to engage in carry trade activity, and this behavior becomes more intense as interest rate differentials increase.

The model in Table 11 sets  $\delta$ , the coefficient on between the local currency deposit rate and borrowing costs in the U.S., equal to 0, but allows for a differential effect of capital controls through  $\eta$ . In this case  $\eta$  is always positive, and  $\beta$  is positive in two of the three regressions. However, the coefficients are never statistically significant and neither is their sum.

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<sup>39</sup> The authors use three different definitions of foreign bond issuances (the log of 1 plus foreign currency bond issuances, the log of 1 plus the ratio of foreign currency issuances to sales; and a dummy variable that takes a value of 1 if firm  $i$  issued a foreign currency bond in year  $t$ ).

**Table 9: The Relationship between Bond Issuances and Cash Holdings of Nonfinancial Corporations in Latin America**

	(1)	(2)	(3)
FXB	0.0201 (0.0127)	0.723 (0.558)	0.139* (0.0739)
Observations	2,940	2,940	2,940
Number of Firms	261	261	261
Firm Fixed Effects	YES	YES	YES*
Country-year Fixed Effects	YES	YES	YES
FXB is	$\ln(1+FXB)$	$\ln\left(1+\frac{FXB}{Sales}\right)$	Dummy

Note: This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variable is foreign currency bond issuances (FXB). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects, and country-year fixed effects. The table is based on Caballero et al. (2015). Robust standard errors clustered at the firm level in parenthesis. \*\*\*, \*\*, \* denote significance at 1, 5 and 10 percent levels.

**Table 10: The Effect of Interest Rate Differentials on the Relationship between Bond Issuances and Cash Holdings of Nonfinancial Corporations in Latin America**

	(1)	(2)	(3)
FXB	0.0191 (0.0122)	0.786 (0.508)	0.132* (0.0733)
FXB*SP	0.00390** (0.00182)	0.0641 (0.0615)	0.0206* (0.0113)
Observations	2,940	2,940	2,940
Number of Firms	261	261	261
Firm Fixed Effects	YES	YES	YES*
Country-year Fixed Effects	YES	YES	YES
FXB is	$\ln(1+FXB)$	$\ln\left(1+\frac{FXB}{Sales}\right)$	Dummy

Note: This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB) and the interaction between FXB and the demeaned spread between local deposit rate and borrowing costs in the U.S. (SP). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects, and country-year fixed effects. The table is based on Caballero et al. (2015). Robust standard errors clustered at the firm level in parenthesis. \*\*\*, \*\*, \* denote significance at 1, 5 and 10 percent levels.

**Table 11: The Effect of Capital Controls on the Relationship between Bond Issuances and Cash Holdings of Nonfinancial Corporations in Latin America**

	(1)	(2)	(3)
FXB	0.0129 (0.0219)	-0.487 (0.872)	0.103 (0.130)
FXB*KI	0.0147 (0.0364)	1.965 (1.250)	0.069 (0.209)
Observations	2,940	2,940	2,940
Number of Firms	261	261	261
Firm Fixed Effects	YES	YES	YES*
Country-year Fixed Effects	YES	YES	YES
FXB is	$\ln(1+FXB)$	$\ln\left(1+\frac{FXB}{Sales}\right)$	Dummy

Note: This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB) and the interaction between FXB and the Fernández et al. index of capital account openness to inflows (KI). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects, and country-year fixed effects. The table is based on Caballero et al. (2015). Robust standard errors clustered at the firm level in parenthesis. \*\*\*, \*\*, \* denote significance at 1, 5 and 10 percent levels.

**Table 12: The Joint Effect of Capital Controls and Interest Rate Differentials on the Relationship between Bond Issuances and Cash Holdings of Nonfinancial Corporations in Latin America**

	(1)	(2)	(3)
FXB	-0.0296 (0.0217)	-0.679 (0.757)	-0.149 (0.132)
FXB*SP	0.0183*** (0.00360)	0.757*** (0.155)	0.0959*** (0.0248)
FXB*KI	0.101** (0.0415)	2.489*** (0.915)	0.516** (0.214)
FXB*SP*KI	-0.0250*** (0.00553)	-0.957*** (0.198)	-0.129*** (0.0317)
Observations	2,940	2,940	2,940
Number of Firms	261	261	261
Firm Fixed Effects	YES	YES	YES*
Country-year Fixed Effects	YES	YES	YES
FXB is	$\ln(1+FXB)$	$\ln\left(1+\frac{FXB}{Sales}\right)$	Dummy

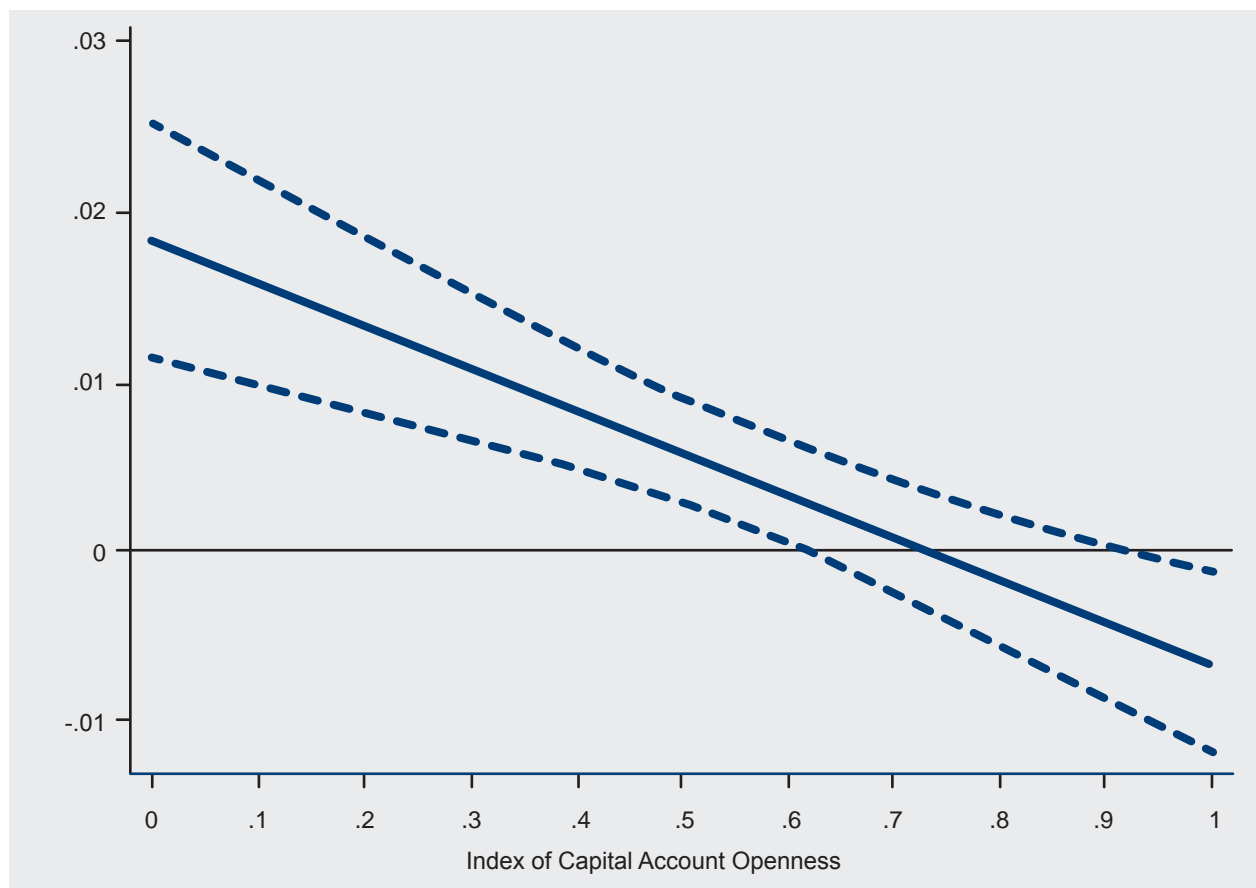
Note: This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB) and the interaction between FXB and each of the demeaned spread between local deposit rate and borrowing costs in the U.S. (SP), the Fernández et al. index of capital account openness to inflows (KI). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects, and country-year fixed effects. The table is based on Caballero et al. (2015). Robust standard errors clustered at the firm level in parenthesis. \*\*\*, \*\*, \* denote significance at 1, 5 and 10 percent levels.

Finally, we report results for the full model in Table 12. Here, estimates of  $\beta$  are negative (but never statistically significant), and those for  $\eta$  are positive (and statistically significant), but the sum is only statistically significant at the 10 percent confidence level (see column 2). This is consistent with the finding in Tables 9 and 11 that for the country-year with the average spread the correlation between bond issuances and cash holding is rarely statistically significant no matter the level

of capital controls. However, the finding that  $\delta$  is positive and statistically significant indicates that in countries with large interest rate differentials, nonfinancial corporations have more incentives to engage in carry trade activities when the capital account is closed.

In order to compute the total effect of foreign bond issuance on nonfinancial firms' cash holdings, we look at the estimates of  $\varphi$ . The results show that  $\varphi$  is negative, statistically significant, and approximately of the same size of  $\delta$ . This last finding has important implications since it indicates that nonfinancial corporations only engage in carry trade activities in countries that limit capital inflows. Caballero et al. (2015) show that the result is robust to using overall capital account openness but that the results are driven by controls on inflows.<sup>40</sup> Figure 27 examines this effect

**Figure 27: Marginal Effect of Spread on the Impact of Bond Issuance on Cash Holdings at Different Levels of Capital Account Openness**



Note: Marginal effect of spread on vertical axis.  
Source: Author's elaboration based on column 1 of Table 12.

<sup>40</sup> Caballero et al. (2015) show that this result holds for a larger sample of countries, and it is robust to a battery of additional tests and control variables.

in greater detail, showing how capital account openness influences the way in which the spread affects the sensitivity of cash holdings to bond issuances.<sup>41</sup>

These results are consistent with those Caballero et al. (2015) find for the full sample. They imply that nonfinancial corporations can use their internal capital markets and inter-company loans that are normally considered foreign direct investment to evade capital controls. In other words, as interest rate differentials increase, the incentives for corporations to engage in carry trade are greater in countries with greater restrictions on the capital account. Therefore, the ability of capital controls to create room for autonomous monetary policy, allowing for greater independence from global financial conditions, is limited by the ability of nonfinancial corporates to issue international bonds.

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<sup>41</sup> Note that Figure 27 shows the derivative  $(\partial[\partial CASH/\partial FXB])/\partial SP$  at different values of KI. The slope of the figure is  $\varphi$  which would be identical to the slope of a figure, which has  $(\partial[\partial CASH/\partial FXB])/\partial KI$  on the y-axis and the spread on the horizontal axis.

A puzzling finding is that such a figure would show that  $(\partial[\partial CASH/\partial FXB])/\partial KI$  is positive and statistically significant when spread are extremely low, it remains positive (but not statistically significant) when the spread is at its average and becomes negative and significant for high spreads. The results should thus be taken with some caution because we do not have a good interpretation for the areas in which  $(\partial[\partial CASH/\partial FXB])/\partial KI$  is positive and statistically significant. This, however, may be due to the presence of non-linearities that are not captured in the simple econometric model described above.

## 5. Policy Implications

Emerging market nonfinancial corporates have dramatically increased their issuance of foreign currency denominated debt over the past decade, albeit from a low base. Nevertheless, we have to be attentive to the risks that they pose. And, since the levels vary substantially across countries and regions, concerns are surely more elevated in some places than in others. But regardless of the level of how justifiable concerns may appear on the surface, the potential for disruption remains.

The policy implications of our analysis relate to the transmission of nonfinancial corporate balance sheet stress to the financial system and the economy at large. As a result, our conclusions are straightforward, and in many ways quite conventional: We need to ensure that financial intermediaries are sufficiently resilient to withstand what could be a substantial shock to their capital and liquidity; and that fiscal and monetary authorities have the capacity to respond to ensure that aggregate demand does not collapse when their large global corporates come under stress.

To get to the specifics, we can start with a summary of the risks we enumerated in the introduction. Recall that firms face four specific risks:

- risks arising from funding being shorter term than investments,
- risks coming from issuing liabilities that are in different currency from revenues,
- roll-over risk caused by a fickle investor base,
- and trading risks resulting from speculative activities.

Our view is that monitoring and controlling any of these would be extremely intrusive and unlikely to succeed. A global firm that is intent on taking on any one of these risks will be able to find a way, somewhere in the world, to do it. In the end, the firm's owners are the only ones with both the incentive and the capacity to control risk-taking of this sort. We see no coherent way to regulate corporate balance sheets directly and control their direct borrowing from international markets.

That said, we do see ways to use market-based metrics (such as FX  $\beta$ ) to identify firms that could encounter trouble in the event of a foreign exchange shock. Such measures facilitate an overall view of vulnerability by incorporating market views of hedging activity (either natural or through derivative positions). Such hedging activity needs to be taken into account before judging the susceptibility of an external commercial borrower to exchange rate movements.

Our concern is with the consequence for a country's financial system and economy should one of these risks materialize. That is, through what channels can a shock of stress or failure in a global nonfinancial corporate enterprise influence an EME's banks and macroeconomic activity?

In the introduction, we described five direct and three indirect channels for transmission. These are:

- A. Direct channels:
  1. impair banking system assets through losses associated with loans to the firm and securities issued by the firm,
  2. create a run on the liabilities of the banking system as a result of withdrawals by the firm to meet its foreign creditor obligations,
  3. increase funding from banks at the expense of SME lending,
  4. and put stress on counterparties that provide currency hedges in derivatives markets.
- B. Indirect channels:
  1. pull back from intermediation services financed by foreign currency bonds,
  2. put their sovereign at risk,
  3. trigger a recession through a reduction in aggregate demand,
  4. and interconnections among firms through supply chains.

We can organize our policy recommendations as responses to each of these risks. But before we do, it is important to emphasize our relative lack of concern for those corporates that have currency mismatches on their balance sheets or off-balance-sheet currency exposures, but that do not have a substantial relationship with any leveraged financial intermediary or that do not account for a big chunk of economic activity (such as Walmart or General Motors in the U.S.).

**For those corporates that are linked to intermediaries, the direct channels are the easiest to manage.** Here, all that is needed is implementation of existing prudential tools. Sufficiently stringent capital and liquidity regulation, including concentration limits, will mitigate the first three.

Put slightly differently, if the primary impact of a reversal of fortunes for EME nonfinancial corporates is on the domestic financial system, built-in regulatory buffers should contribute to the stability of individual financial institutions. Ensuring that these buffers are large enough involves several components: adjustment to risk weights in the computation of capital requirements, increases in run-off rates for computation of liquidity requirements, and implementation of sufficiently severe stress tests for assets and liabilities. We will briefly summarize what we have in mind for each of these.

Risk-weighted capital requirements tend to be based on historical experience with the creditworthiness of similar borrowers. An example is to scale risk weights using credit ratings. In the case of EME corporates that have recently issued a large quantity of foreign currency bonds, even in countries with histories of high foreign exchange rate volatility, there is likely to be little experience with the consequence of currency depreciation that is relevant. As a result, we would recom-

mend supervisors be quite conservative in assessing the riskiness of loans and securities from these firms that appear on bank balance sheets, erring on the side assigning risk weights that may seem too high. One possibility would be to calibrate the risk weights using the firm's FX  $\beta$ —a higher FX  $\beta$  would justify a higher risk weight.

The same goes for liquidity requirements and the liquidity coverage ratio (LCR). The purpose of the LCR is to ensure that banks have liquid assets that are adequate to meet liquidity needs for a 30-day stress scenario.<sup>42</sup> The computation requires assumptions about the rate at which different types of deposits will be withdrawn—what are called “run-off rates.” Our suggestion is that, for corporates with large foreign currency bond exposures, these run-off rates be higher than the minimum set by the international standard. Again, the FX  $\beta$ 's might be used.

Next we consider the risk that when international corporates come under stress, they may turn to banks who will prefer to lend to them rather than to SME borrowers. In other words, an exchange rate shock that hurts firms with foreign -currency-denominated liabilities will be transmitted through the domestic banking system to SMEs. In their asset management, banks will face concentration limits on their exposure to individual borrowers. These are usually in the form of a multiple of the firm's capital. Large firms may run up against these limits. If they do, then the bank's marginal loan will be to an SME.

While concentration limits may work to limit the exposures of banks to large firms, if they bind in times of stress, the financial system will serve to intensify rather than mitigate the shock felt by the real economy.

The other alternative, and one that has been used extensively by both emerging market and advanced economy central banks, is to subsidize lending to SMEs. By providing low-cost liabilities, central banks can nudge commercial banks to lend to certain classes of borrowers. The Bank of England's funding for lending scheme is an example of this sort of policy.

While politicians may love directed lending, economists generally do not. And we are no different. Subsidies create inefficiencies. There is every reason to believe that the chosen firms or sectors that receive the preferential treatment in these schemes are not the most productive from a social point of view. The question is whether this is really better than nothing. We have our doubts.

Turning to off-balance sheet activity exposures of banks to nonfinancial corporate counterparties, the solution is clearly at hand: central clearing of all derivatives contracts. Central clearing parties (CCPs) provide a broad array of benefits in these circumstances. First, margin requirements reduce counterparty risk. Second, they allow for the monitoring of positions—both their size and concentration. And third, by facilitating trade compression and multilateral netting, they reduce the risks arising from interconnectedness in the markets. The key here is that, since our concern is with nonfinancial corporates, the final user exemption has to be eliminated. Otherwise these firms engage in a form of regulatory arbitrage, providing risk-transfer services of a financial intermediary while evading the clearing requirement.

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<sup>42</sup> Basel Committee on Banking Supervision, “Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools,” January 2013.



In advocating that industrial companies be required to clear their derivatives transactions through CCPs, we are going against what is becoming the standard international practice of exempting final users from central clearing. There are a variety of reasons to be skeptical of the exempted users, and the risks that EME corporates may create for intermediaries in their home countries is one of them. It is our strongly held view that a large corporate issuing of significant foreign-currency-denominated debt that is a counterparty to derivatives contracts should be forced to centrally clear those transactions.

In the case of EME-currency denominated derivatives, there are outstanding issues associated with market structure that need to be resolved. Where should these derivatives be cleared? And how should an offshore CCP be treated? These are very complex issues that are well beyond the scope of this report. What we will say is that EMEs are unlikely to have markets that are large enough to justify having their own CCPs, so clearing will likely occur offshore. Regulators and supervisors will have to take this into account in setting the requirements for their intermediaries.<sup>43</sup>

Turning to the indirect channels, we start with the first: Where once was a nonfinancial corporate has become simply a bank by another name. This difficult issue is being faced by authorities in advanced and emerging market economies alike. The solution is to regulate activities or functions, rather than entities. This is much easier said than done, so we leave the complete solution for another day. For now, what we will say is that any entity that is providing banking services—credit, maturity, or liquidity transformation in the parlance of Pozsar et al. (2012)—should face the same regulations and the same supervision as a bank. For example, if a corporate is issuing short-term commercial paper and using the proceeds to make long-term loans to other firms, this maturity transformation activity should attract regulatory capital requirements.

We treat the two indirect risks—pressure on the sovereign and the macroeconomic slowdown—together. In both, the scope for an effective policy response is more challenging for those emerging countries with significant current account deficits and/or substantial negative net foreign currency positions. Under these conditions, a fiscal or monetary policy easing makes it more difficult to fund the current account deficit, while associated currency depreciation has an adverse balance sheet impact in relation to foreign currency debt obligations. Whether these offsetting factors make it unhelpful to deploy monetary policy depends on the relative power of these financial channels versus the stimulative impact of a looser monetary policy for the overall economy.<sup>44</sup>

That said, when considering these risks, the traditional answer seems the most apt: the less indebted the fiscal authority, the more room for maneuver. With a limited outstanding stock of sovereign debt, investors will be less concerned about the potential for issuance to obtain the resources necessary to support a large international corporate should it begin to fail. In addition,

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<sup>43</sup> This is related to discussions on what is called “substituted compliance” and “mutual recognition,” as well as how to manage the risks in the CCPs, as they get very large. See, for example, the Financial Stability Board’s report to G-20 finance ministers and central bank governors entitled “Jurisdictions’ ability to defer to each other’s OTC derivatives market regulatory regimes,” 18 September 2014.

<sup>44</sup> See Cespedes et al. 2002, Cespedes et al. 2014, and Devereux et al. 2006.

having the ability to engage in countercyclical fiscal and monetary policy requires both a low level of sovereign debt and central bank credibility.

In summary, this report has focused on the financial risks associated with the increase in corporate debt in emerging economies. In principle, there are significant benefits from the increased capacity of emerging corporates to tap a diverse range of domestic and international funding sources, rather than being tied to just the domestic banking system. However, as this report has outlined, it is also possible to identify new sources of risk to financial stability, especially in situations in which corporates acting as financial speculators and/or domestic banks fail to fully understand the underlying domestic and international exposures of the corporate sector. Accordingly, it is timely for governments and financial regulators to review risk surveillance and macroprudential policies (along the lines advocated in this concluding section) in order to ensure that these risks are suitably contained.

# Data Appendix

In this data appendix, the details of the countries included in each figure are provided.

## Figure 1:

Argentina, Brazil, Chile, China, Colombia, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, South Africa, Thailand, and Turkey.

## Figure 2:

Argentina, Armenia, Belarus, Bulgaria, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Georgia, Hungary, India, Kazakhstan, Korea, Macedonia, Mexico, Moldova, Peru, Philippines, Romania, Russia, Slovakia, South Africa, Thailand, Turkey, Ukraine, and Uruguay.

## Figure 3:

Argentina, Brazil, Bulgaria, China, Colombia, Czech Republic, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Poland, Russia, South Africa, Thailand, Turkey, and Ukraine.

## Figure 4:

Angola, Argentina, Bahrain, Belarus, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Hong Kong, Hungary, India, Indonesia, Israel, Jordan, Kazakhstan, Korea, Kuwait, Latvia, Lithuania, Macedonia, Malaysia, Mauritius, Mexico, Morocco, Namibia, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russia, Singapore, Slovak Republic, Slovenia, South Africa, Sudan, Swaziland, Taiwan, Thailand, Tunisia, Turkey, Ukraine, Uruguay, and Venezuela.

## Figure 5:

Argentina, Brazil, Chile, China, Colombia, Costa Rica, Dominican Republic, El Salvador, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Russia, Singapore, South Africa, Taiwan, Thailand, Tunisia, Turkey, Ukraine, and Uruguay.

## Figures 6, 10, and 12:

All countries included in the Bank for International Settlements Global Liquidity Indicators.

## Figure 7:

All derived liabilities of emerging countries vis-à-vis the countries reporting data to the Coordinated Portfolio Investment Survey (CPIS) of the IMF.

## Figure 8:

China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand, and Vietnam.

**Figure 9:**

Albania, Algeria, Argentina, Armenia, Azerbaijan, Bangladesh, Belarus, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Burkina Faso, Cambodia, Cameroon, Chad, Chile, China, Colombia, Congo, Rep. of, Côte d'Ivoire, Croatia, Czech Republic, Dominican Republic, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Fiji, Gabon, Georgia, Ghana, Guatemala, Guinea, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Korea, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mexico, Moldova, Morocco, Mozambique, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russia, Rwanda, Senegal, Singapore, Slovakia, Slovenia, South Africa, Sri Lanka, Syria, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, and Zambia.

**Figure 11:**

Brazil, China, India, and Turkey.

**Figures 13 and 14:**

India.

**Figure 15:**

Argentina, Brazil, China, Czech Republic, Hungary, India, Indonesia, Korea, Mexico, Malaysia, Poland, Russia, Thailand, Turkey, and South Africa.

**Figures 16, 17, 19, and 20-23:**

Turkey.

**Figure 18:**

Argentina, Brazil, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Hungary, Indonesia, Israel, Latvia, Lithuania, Mexico, Poland, South Africa, Turkey, and Ukraine.

**Figures 24-27**

Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

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