

Shifts in Global Credit and Corporate Access to Finance

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Abstract

Employing a dataset of 1,160 Indian firms, we study the impact of global financing conditions on firms' borrowings abroad across different phases of global credit. While the abundant credit in the post global financial crisis period allowed firms to take advantage of relatively cheap financing abroad, we show that firms' access to external finance has declined since 2013. We find that since 2013, lenders are differentiating across borrowers and it is specifically the less risky and more profitable firms that are increasing their foreign borrowings even at the times of higher global risk. We do not find evidence of regional and domestic credit offsetting this global effect. Furthermore, we find that the reduced access to external finance in the post-2013 period is associated with a decline in firms' real investment activities, highlighting the real effects of global credit dynamics.

JEL Classification codes: F32; F34; G15; G30

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1. Introduction

Global credit dynamics have important implications for the build-up of domestic financial imbalances (Borio 2014; Borio and Disyatat, 2011). The abundant credit in the post-global financial crisis (GFC) period has led to a substantial growth in corporate debt, increasing co-movement of domestic interest rates with interest rates abroad and greater exposure to foreign exchange risk in recipient countries (Azis and Shin, 2015; Mohanty, 2014). Marking the end of this period of benign global credit conditions, the announcement of future tapering of the Fed's quantitative easing program in May 2013 unleashed massive capital outflows from emerging markets (Bank for International Settlements, 2013). Figure 1 provides evidence of the slowdown in capital flows to emerging markets in the post-2013 period. This episode, termed taper tantrum, has since been followed by other similar episodes, characterizing a new phase of heightened risk perceptions in international markets and increased capital flow volatility (Azis and Shin, 2015; Bank for International Settlements, 2016; Khatiwada, 2017). The most recent episode is the broad sell-offs in emerging markets during the first quarter of 2020 triggered by the Covid-19 crisis that resulted in record capital outflows from emerging markets (International Monetary Fund, 2020). In this paper, we investigate how global credit dynamics affect firms' access to external finance by employing a detailed dataset of foreign borrowings by Indian firms.

We employ an unbalanced panel of 1,160 Indian firms for the period of 2000-2017. Our dataset offers a complete picture of external borrowings as it includes borrowings abroad not only by Indian residents, but also via foreign affiliates. This is important as firms increasingly tap international bond markets via their foreign offices.¹ Moreover, we study all foreign currency borrowings, originating from banks and bond markets alike. Although firms increased

¹ At the end of 2017, debt outstanding by Indian corporations amounted to USD 60bn, of which only USD 27bn is issued by Indian residents (BIS Debt Securities Statistics).

their bond issuances in the post-GFC period, bank credit still represents the main source of foreign credit in emerging markets (Aldasoro and Ehlers, 2018).² We study global credit during three distinct phases: the pre-GFC crisis period which was dominated by global banks as major credit providers around the world (Bruno and Shin, 2015); the post-GFC crisis period (2010-2013) characterized by corporations issuing directly on international bond markets (Shin 2013); and the post-2013 period of capital flow volatility (Azis and Shin, 2015) marked by a declining influence of global factors and increased role of regional and emerging market banks in the provision of international credit to emerging markets (Amiti, McGuire, and Weinstein, 2019; Avdjiev et al. 2020; International Monetary Fund, 2015). In the light of the receding role of global players during the post-2013 period, we investigate whether the most recent changes in risk perceptions have substantially affected firms' access to external finance. We address these questions by exploiting the particular case of Indian firms that tap the international markets to finance their businesses via the well-established External Commercial Borrowing program, in addition to issuing international bonds.

India provides an interesting case study for the empirical analysis for two main reasons. First, across the emerging market economies, India is the second largest country with the highest external debt funding (in absolute terms) among non-financial corporations at the end of 2019. As most of the external debt is denominated in foreign currencies (majorly USD), the ranking of emerging markets is not very different based on the level and importance of foreign borrowings (Avdjiev, McGuire, and von Peter, 2020). Second, India experienced shifts in global financing conditions particularly due to the US monetary policy during the post-2013 taper tantrum period which resulted in net bond outflows of \$13bn³ (Azis and Shin, 2015; Bank for International Settlements, 2013). In addition, credit provision to Indian borrowers from

² At the end of 2017, international bond outstanding by Indian nationals amounted to USD 60bn compared to USD 110bn of international bank credit to Indian private nonbanks.

³ According to Institute of International Finance (IIF) data.

Japanese and Australian banks increased in the post-GFC period, with a third of international bank credit to India originating from Japanese banks at the end of 2017 (BIS Locational Banking Statistics). Furthermore, this study is relevant for firms in other emerging markets due to the vulnerabilities associated with reliance on external finance and the potential lack of domestic alternatives because of less developed domestic debt markets.

In line with the literature, we find that firms' foreign borrowings increase when global risk is low and the interest rate differential between the home country and the US is favorable. However, we find that this effect has reversed since 2013. More specifically, we find that only firms with higher creditworthiness are able to raise foreign financing at times of higher global risk and unfavorable global financing conditions during the post-2013 period. The bank lending channel of monetary policy transmission offers a potential explanation for this finding. In the context of increased risk and risk aversion in the post-2013 period, lenders may be less willing to provide credit abroad as their leverage constraints tighten and funding costs increase due to the contractionary US monetary policy (Avdjiev and Hale, 2019). Thus, in the context of greater market turbulence in the post-2013 period, we find that lenders are differentiating across borrowers and it is especially the less risky and more profitable firms that are exposed to global factors and are increasing their foreign borrowings at times of higher global risk.

Further, the declining exposure of firms' external borrowings to global factors may also be related to a composition effect as regional banks replace global investors as the main credit providers to emerging markets (Bénétrix et al., 2019; Cerutti and Zhou, 2017; Koch and Remolona, 2018). Although we document that firms do increasingly rely on external finance from regional lenders in the post-2013 period, this effect is not large enough to offset their exposure to global factors. We also find that the response of domestic credit to global factors is similar to foreign borrowings, hence they act as complements rather than substitutes for global credit (Bräuning and Ivashina, 2020; Morais et al., 2019). Finally, we explore important

implications on firms' real activities and find that firms cut back on their investment spending as a consequence of changes in global credit dynamics in the post-2013 period.

Our paper contributes to the literature on the transmission of financing conditions across borders and the implications for credit dynamics and financial stability in local economies. This large literature documents that the accommodative US monetary policy results in greater corporate leverage and bond issuances in the emerging markets especially during the post-GFC crisis period (Alter and Elekdag, 2020; Avdjiev et al., 2020; Lo Duca, Nicoletti, and Vidal Martínez, 2016; Herwadkar, 2017). This effect is not restricted to the US monetary policy as global factors are also found to affect firms' propensity to borrow abroad (Feyen et al., 2015). Employing a similar dataset to ours, Acharya and Vij (2017) find evidence of carry trade activity by Indian firms during the sample period from 2004 to 2015 as corporations with greater cash holdings borrow more from abroad when interest rate differential between India and the US are favorable. However, global credit conditions have changed recently and capital flows towards emerging markets have experienced greater volatility since 2013 with frequent episodes of sell-offs (Bank for International Settlements, 2016).

Few studies document the changes to global credit in the post-2013 period. In particular, Avdjiev and Takats (2014) find that the decline in cross-border bank flows due to the taper tantrum episode is mainly driven by domestic factors as opposed to global factors. Avdjiev et al. (2020) document that the sensitivity of international bank credit to global risk has declined since 2013 (up to 2015, the end of their sample period). Moreover, Amiti, McGuire, and Weinstein (2019) show how idiosyncratic factors have taken over global factors as bank flow drivers since 2013. We build on these findings by focusing on the major changes in global credit provision in the past two decades, and particularly since 2013. We extend the literature by investigating whether these changes have altered firms' access to global credit and their real activities.

The rest of the paper is organized as follows. Section 2 reviews the literature. We report the data and summary statistics in section 3. Section 4 provides the methodology and results for the effects of global credit on foreign borrowings. Section 5 concentrates on the different liquidity phases and section 6 focuses on the implications of firm heterogeneity. Section 7 investigates regional and domestic credit substitution and the real effects of global credit dynamics. Section 8 reports the robustness tests, and we provide the conclusion in section 9.

2. Background literature

Even if cross-border bank lending is a small component of domestic credit in most emerging economies (it accounts for 7% of Indian overall domestic credit as of 2017)⁴, bank flows affect domestic credit growth and asset price dynamics in recipient economies (Banti and Phylaktis, 2019). Shin (2012) shows that permissive financing conditions are transmitted globally via cross-border banking and global banks leverage. The role of global factors as drivers of bank flows is evident in the period leading to the GFC. In this period, Amiti, McGuire, and Weinstein (2019) show that common factors drive bank flows, providing evidence for India and other emerging economies.

The sharp rise in foreign borrowings by the non-financial corporations following the GFC documented by Shin (2013) has led to a nascent strand of the literature focusing on the linkages between firms' foreign borrowings and global financing conditions. In this respect, Acharya and Vij (2017), Bruno and Shin (2017), and Caballero, Panizza, and Powell (2016) document that firms issue abroad to take advantage of interest rate differentials between the US and their domestic money market to earn carry trade profits. Focusing on the US monetary policy, Lo Duca, Nicoletti, and Vidal Martínez (2016) show that the Fed's asset purchase programs under the quantitative easing (QE) framework affects international corporate bond issuances.

⁴ According to the BIS International Banking Statistics.

Analyzing both global conditions and country factors, Feyen et al. (2015) show that firms' (and sovereigns') propensity to issue bonds abroad increases as global financial conditions ease. Global drivers are also related to increasing corporate leverage, especially in the post-GFC period. In this respect, Herwadkar (2017) documents that global factors including the US monetary policy led to higher corporate leverage in the post-GFC period when domestic and firm-specific factors became less important. This finding is confirmed by Alter and Elekdag (2020) who show that eased US monetary policy drives corporate debt in emerging markets in the post-GFC period. The authors find that the effect is stronger for firms that rely on external finance and smaller firms. Thus, the authors argue that the role of global financing conditions operates in part by reducing corporate borrowing constraints in domestic markets. In this respect, Bräuning and Ivashina (2020) find that riskier firms within countries borrow more at times of eased US monetary policy. Looking at loan-level data for Mexico, Morais et al. (2019) show how banks relax credit conditions more for firms that pay higher interest rates when the US monetary policy eases.

Moreover, the literature provides some evidence that global factors also affect domestic credit conditions. Thus, domestic credit responds in a similar way to global factors as foreign borrowings instead of acting as an alternative source of external finance. Gozzi et al. (2015) argue that the international bond market is not a substitute for the domestic bond market but is rather complementary. Serena and Moreno (2016) report that external financing conditions (measured by the VIX) affect onshore bond issuances in a qualitatively similar way as offshore bond issuances, indicating transmission of global factors to local bond markets. Focusing on domestic bank credit, di Giovanni et al. (2019) document that domestic currency borrowings increase when the VIX is low, as domestic credit becomes relatively cheaper. Also, domestic lenders of USD do not substitute for foreign lenders as pointed out by Bräuning and Ivashina (2020).

Amongst global factors, the US monetary policy has been particularly relevant in the literature due to the dominance of the USD as the main currency of denomination for international bank credit (Agrippino-Miranda and Rey, 2020).⁵ Importantly, even if USD credit is intermediated by non-US banks towards non-US borrowers, the US monetary policy still affects cross-border bank credit towards non-banks (Takáts and Temesvary, 2020). This is relevant for emerging markets, as well as for the specific case of India. According to BIS Locational Banking Statistics, USD credit represents the largest share of international bank credit to India which is mostly intermediated by non-US banks (majorly Japanese banks). As a result, the US-based global factors are central to fully appreciate the exposure of firms in emerging markets and specifically Indian firms in this paper.

The evidence provided so far in the literature suggests that the impact of global factors significantly reduces after the taper tantrum episode in May 2013. Following the taper tantrum, Avdjiev and Takats (2014) report that domestic considerations, including the current account balance and exposure to foreign credit denominated in USD, are main factors to explain the declining bank flows to emerging markets. Avdjiev et al. (2020) document that the impact of global factors on corporate foreign borrowings declines in the post-2013 period (until 2015, the end of their sample period) with the VIX turning insignificant in explaining changes in both cross-border bank borrowings and international bond issuances. Amiti, McGuire, and Weinstein (2019) show that bank flows to emerging markets including India are mainly driven by idiosyncratic shocks as opposed to global shocks in the post-crisis period. We contribute to this nascent strand of the literature and investigate whether changes in global credit conditions affect firms' ability to access external finance.

⁵ The literature on the impact of US monetary policy on international bank credit is vast. See Albrizio et al. (2019) and Buch et al. (2019) for recent work on this, and papers within.

Few studies have investigated the drivers of this shift in global credit. Avdjiev et al. (2020) argue that the shift towards better capitalized lenders in the post-2013 period explains the lower sensitivity of international bank credit to global risk factors. Bénétrix et al. (2019) also points towards a change in the composition of international bank linkages post-GFC, as Euro Area banks reduce their offshore operations in a one-off episode of deleveraging to adjust the risk profile of their balance sheets. In fact, they note that banks from other financial systems, including Japan, have steadily increased their operations abroad. This is confirmed also in Koch and Remolona (2018) that document the declining exposure of Asian banks to common lenders from the Euro Area in the same period. Finally, Cerutti and Zhou (2017) conduct a study of regionalization in the global banking network. We extend this limited body of the literature and study the consequences of this shift in global credit on firms' ability to access external finance and its impact on domestic economic activity.

3. Data and summary statistics

3.1 The dataset

We employ a dataset covering profit and loss and balance sheet data assembled by Centre for Monitoring Indian Economy (CMIE) in their Prowess database. CMIE is a private research organization in India that collects data and makes it available through Prowess. The Prowess database covers detailed information on the profit and loss statement and balance sheet.⁶ The majority of the companies incorporated in the database are listed on stock exchanges. Following normal selection criteria, observations in the 1% from upper and lower tails of the distribution of the firm-level financial variables are excluded to control for outliers. Finally,

⁶ See www.cmie.com for more information on the Prowess database, which has been widely used in several studies such as Acharya and Vij (2017), Bose, Filomeni, and Mallick (2021), Bose, Mallick, and Tsoukas (2020) and Mallick and Yang (2013).

the panel has an unbalanced structure of 1,160 Indian non-financial firms for the period of 2000-2017 from different sectors, such as manufacturing, utilities, resources, and services.

In our analysis, we focus on firms' foreign borrowings calculated as the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets to minimize the impact of outliers (Acharya and Vij, 2017).⁷ Moreover, we include firm-level controls such as *firm size*, measured as log real total assets. Firms that are larger in size are able to cope well with financial constraints and have greater access to external finance (Bose, MacDonald, and Tsoukas, 2019). Therefore, we expect size to be positively associated with access to foreign currency borrowings. *Liquidity* is measured by the quick ratio calculated as the ratio of quick assets to quick liabilities. According to Ozkan (2001), higher liquidity might encourage firms to have higher debt ratios due to increased ability to meet short-term obligations, implying a positive relationship between liquidity and external finance. *Tangibility* is defined as the ratio of net fixed assets to total real assets. Firms with higher tangibility have higher ability to borrow from external financial markets (Bruno and Shin, 2017). Finally, *exporting firm* is a dummy that takes the value of one if a firm has positive export sales, and zero otherwise. Beck, Demirgüç-Kunt, and Maksimovic (2008) highlight that exporting firms use more external finance compared to non-exporting firms. We anticipate a positive relationship between foreign borrowings and liquidity, tangibility, and exporting status of firms.

3.2 Global, regional and domestic factors

The literature that investigates the role of corporations to channel global financing conditions in local economies relies on a variety of measures capturing the effects of the US monetary policy and global risk aversion. Following the literature, we employ four standard measures of

⁷ Foreign currency borrowing is defined in the Prowess database as any loan taken by the company in a currency other than in Indian rupees. Examples of such loans are commercial bank loans, Floating Rate Notes, etc. They also include credit from official export credit agencies and commercial borrowing from the private sector window of multilateral financial institutions such as IBRD, World Bank and Asian Development Bank. Suppliers' credit is not included here.

global factors, such as the *VIX*, the *US BBB-rated corporate yields*, the *MOVE index*, and the *interest rate differential* between India and the US.⁸

The *VIX* is the implied volatility in the S&P 500 option prices which is a measure of risk aversion in global markets and global bank funding conditions and is extensively used in the literature as a key driver of capital flows (Koepke, 2019), cross-border bank lending (Bruno and Shin, 2015; Cerutti, Claessens, and Ratnovski, 2017), and, more recently, the global financial cycle (Agrippino-Miranda and Rey, 2020). The *US BBB-rated corporate bond yields* capture the perceived riskiness of investment grade corporate bond issuances in the US, so that higher yields represent greater investors uncertainty and reflect tighter conditions for borrowers across the world and particularly in emerging markets (Feyen et al., 2015). Furthermore, we employ the *MOVE index* that is the bond market equivalent to the *VIX* and is calculated as the implied volatility in US treasuries at various maturities. These three measures capture risk aversion in global markets, so an increase in their levels indicate increasing global risk aversion and tighter financing conditions abroad. The data for the *VIX*, US corporate yields, and the *MOVE* are taken from CBOE, FRED dataset, and DataStream, respectively.

Finally, we employ the *interest rate differential* between India and the US as we are interested in the dynamics of global financing conditions in relation to domestic conditions.⁹ This measure is calculated as the difference between annual short-term money market interest rates in India relative to the US. An increase in this measure represents a widening of the

⁸ Focusing on US monetary policy more specifically, we also use an alternative measure for global factor, such as the US treasury yield slope or term spread measured as the difference between the 10-year and 3-month US treasury yields, and the results are qualitatively and quantitatively similar to the main results. Alongside the conventional measures for global risk, we employ an additional proxy based on the strength of the USD that according to Avdjiev et al. (2019) captures the balance sheet capacity of global banks particularly well in the period of strong USD during post-2014. This measure is the FRB broad dollar index and it is calculated as the trade-weighted USD exchange rate versus the currencies of its main trading partners. These results also confirm our main findings that use the other measures of global risk. We do not report these results for brevity but they are available upon request.

⁹ Other studies have used the US interest rates (Alter and Elekdag (2016) and Herwadkar (2017), the Fed purchases and holdings (Lo Duca, Nicoletti, and Vidal Martínez, 2016), and countries' interest rates relative to the US (Acharya and Vij, 2017; Bruno and Shin, 2017; Caballero, Panizza, and Powell, 2016).

interest rate spread and, thus, an improvement in the US financial conditions versus domestic ones. We expect foreign borrowings to decline when risk aversion and uncertainty in global markets are higher, and an increase in foreign borrowings when the interest rate differential is favorable as firms borrow more abroad when financing conditions are easier abroad than domestically. Data for this variable is obtained from the OECD database.

Alongside global factors, we include a regional factor to capture the impact of regional lending on Indian firms. Recent reports by the BIS and IMF highlight the importance of regional cross-border bank credit in Asia, especially originating from Japan and China (Bank for International Settlements, 2014; International Monetary Fund, 2015). According to the BIS Locational Banking Statistics, Japanese banks have the largest cross-border claims on Indian non-bank borrowers at the year-end of 2017. Hence, we take the *Japanese VIX* as a proxy for investor uncertainty in financial markets in the region as measured by the NIKKEI stock average volatility index available from DataStream.

As foreign credit is an equilibrium variable and we are interested in isolating the effect of supply-side factors, we also include a vector of domestic factors to control for the demand-side of foreign credit in line with Koepke (2019). In particular, we include the real domestic annual *GDP growth* to capture the economic performance of the country. To control for local asset performance, we include the *stock market returns* calculated as the annual returns of the stock market index of the Indian stock exchange and the *currency returns* of the Indian rupee versus the USD. Finally, for country risk we include *external debt ratio* calculated as the ratio of external debt to GDP which measures the overall riskiness of domestic borrowers.¹⁰ The data for the domestic factors is obtained from the IMF and World Bank databases.

¹⁰ We do not include the standard Chinn-Ito indicator for capital account openness, because the Chinn-Ito index for India is constant throughout our sample period from 2000 to 2017.

3.3 Summary statistics

The dynamics of foreign borrowings and global conditions over the period of 2000-2017 are shown in Figure 2. Figure 2(a) shows an increase in the firms' foreign borrowings from the early 2000s with a steeper growth during the post-GFC phase, followed by a decline in foreign borrowings during the post-2013 phase. Figure 2(b) shows a persistent decline in global factors in the post-GFC period until 2014, followed by an increased volatility of the measures representing uncertainty in global markets during the post-taper tantrum period. For instance, there is a significant increase in VIX of almost 20% from 2013 to 2015. Further, the *interest rate differential* also shows a sustained drop in the post taper tantrum period. Overall, all global factors point towards a change in global credit conditions around the taper tantrum period.

Next, Table 1 reports the summary statistics for all the variables during different phases of global liquidity. We report means and standard deviations for the whole sample (column 1), second and third phases (columns 2-3), followed by the *p*-values for the test of equality of means between the two phases (column 4). To begin with, the statistics show that the share of foreign borrowings declined significantly in the third phase as compared to the second phase in line with Figure 2(a). We do not find any significant difference in the share of domestic borrowings in both periods, while there is a decline in firms' investment spending in the third phase as compared to second phase. Finally, all other firm and domestic characteristics have improved in the third phase as compared to second phase. The following sections provide a formal regression analysis on the relationship between global financing conditions and firms' foreign borrowings.

4. Global credit conditions and foreign currency borrowings

In order to investigate the impact of global credit conditions on firms' foreign borrowings, we set our baseline model drawing on the push and pull factors of capital flows adopted by the

recent literature on global drivers of cross-border bank flows (Cerutti, Claessens, and Ratnovski, 2017). Koepke (2019) provides a thorough review of these models and identifies the main factors that drive capital flows. Following this literature, we define our baseline model as follows:

$$FCB_{it} = a_0 + a_1GF_{t-1} + a_2second\ phase_t + a_3third\ phase_t + a_4RF_{t-1} + a_5FF_{it-1} + a_6DF_{t-1} + f_i + \varepsilon_{i,t} \quad (1)$$

where the dependent variable ‘*FCB*’ is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets to minimize the impact of outliers (Acharya and Vij, 2017). ‘*GF*’ refers to the global financing factors such as the *VIX*, the *US BBB-rated corporate yields*, the *MOVE index*, and the *interest rate differential*, which are the main variables of interest in this model. The dummy for *second phase* takes value one for the period of 2010-2013 (Shin 2013) and zero otherwise, while the dummy for *third phase* takes value one for the period of 2014-2017 (Azis and Shin, 2015) and zero otherwise. ‘*RF*’ refers to regional factor that captures the effect of cross-border credit from regional lenders such as *Japanese VIX*. ‘*FF*’ is a vector of firm-specific characteristics such as *size*, *liquidity*, *tangibility*, and *exporting status* of firms, and ‘*DF*’ is a vector of domestic factors to control for demand-side considerations of credit such as *GDP growth*, *stock market returns*, *currency returns* and *external debt ratio*. All explanatory variables are lagged by one period to reduce possible simultaneity problems. Finally, we include firm-level (f_i) fixed effects to control for firm heterogeneity.¹¹

We report the results of the estimations of equation (1) in Table 2. Firstly, we focus on the global factors which are the main variables of interest in this model. We find a negative and significant impact of the *VIX* (column 1), as well as of other global risk factors such as the *US*

¹¹ We control for the global financial crisis (GFC) in the models using a dummy that takes value one for the period 2008-2010, and zero otherwise and the results are qualitatively and quantitatively identical to the main results reported in the tables. We do not report these results for brevity but they are available upon request.

corporate bond yields (column 2) and the *MOVE* (column 3) on foreign borrowings as firms increase their foreign borrowings at times of lower risk and uncertainty in the global markets, and reduce their foreign borrowings when global risk is higher (Cerutti, Claessens, and Ratnovski, 2017). We also document a positive and significant coefficient for the *interest rate differential* (column 4) on foreign borrowings which implies that firms in India borrow from abroad when global credit conditions are more favorable (Bruno and Shin 2017). We find the effects to be economically significant. For instance, in column 1, we find a one unit reduction in *VIX* increases foreign currency borrowings by 3.6%.

Next, we find that the foreign borrowings are higher in the second phase (*second phase*), while they have declined in the third phase (*third phase*). Turning to the regional factors, we find a significant role of regional lenders on firms' external borrowing in India, as foreign borrowings increase when the Japanese *VIX* (*JP VIX*) is low. This effect is in addition to the effect of the global factors highlighting the presence of significant regional linkages. This supports the evidence in the literature of the increasing importance of regional lenders, especially in Asia (Bank for International Settlements, 2014; International Monetary Fund, 2015). Moving to other control variables, we find a positive and significant impact of firm liquidity suggesting that foreign currency borrowings increase with firms' liquidity. Finally, we find that foreign borrowings increase with currency appreciation and lower external debt ratio.

5. Global credit and firms' foreign borrowings through time

Until the GFC, global banks have been the main source of financing in international markets providing marginal funding to emerging markets (Borio and Disyatat, 2011). As global banks retreated from these markets post-GFC, the heightened appetite of international investors for relatively high yielding corporate bonds from emerging markets led to a sharp increase in

firms' issuing in international bond markets (Shin, 2013). Starting with the taper tantrum in May 2013, increased risk perception towards emerging markets has led to a sharp increase in volatility of capital flows. As noted by Azis and Shin (2015), the impact of the taper tantrum has been particularly strong on India, amongst other countries in the Asian region, with capital outflows and currency depreciation. In the post-2013 global markets, international investors continue to look for profitable opportunities abroad and in emerging markets, driven by the persistent low yields in the major financial markets around the world. However, this search for yield now takes place in the context of increased risk aversion and uncertainty driven by concerns for the global outlook. Since the taper tantrum, global markets have been characterized by frequent and serious episodes of sell-offs triggered by disappointing news on economic growth and future outlook from emerging market economies (Bank for International Settlements, 2016).

In order to determine whether firms' foreign borrowings are related to easing financing conditions abroad during different liquidity phases, we augment the baseline model by introducing interaction effects between the global factors (GF) and dummies for second and third phases of global liquidity. We estimate the following model:

$$FCB_{it} = a_0 + a_1 GF_{t-1} * second\ phase_t + a_2 GF_{t-1} * third\ phase_t + a_3 second\ phase_t + a_4 third\ phase_t + a_5 GF_{t-1} + a_6 RF_{t-1} + a_7 FF_{it-1} + a_8 DF_{t-1} + f_i + \varepsilon_{i,t} \quad (2)$$

Our coefficients of interest are a_1 and a_2 that measure the marginal impact of the global factors on foreign currency borrowings during second and third phases of liquidity, respectively.¹² This allows us to determine whether different global conditions have driven Indian firms to take advantage of financing abroad. We expect a negative coefficient a_1 during

¹² To check the robustness of our results at a higher frequency, we use quarterly aggregated data on cross-border bank credit and outstanding amount of debt instruments issued abroad by non-financial corporations from the BIS International Banking and Debt Securities Statistics as alternative measures for foreign borrowings. We report these results in Section 8.2.

the second phase as firms increase foreign borrowings in the context of low risk aversion and abundant liquidity in global markets. In contrast, we expect a weaker (or opposite) effect of the global factors during the third phase, captured by a_2 , due to the increased global risk and market turbulence episodes in the post-2013 period (Avdjiev et al., 2020; Avdjiev and Takats, 2014).

The results from the estimation of equation (2) are reported in Table 3. The coefficients of interaction terms, ' $GF*second\ phase$ ' and ' $GF*third\ phase$ ', capture the marginal impact of global factors during second and third phases, respectively. The coefficients for the interaction term ' $GF*second\ phase$ ' are negative and significant for global risk factors (columns 1-3) indicating that firms increase their foreign borrowing at times of lower risk in global markets during the post-GFC period. This is in line with Avdjiev et al. (2020) that the sensitivity of international bank credit to the VIX is stronger in the post-GFC crisis period.

While foreign borrowings increase when global financing conditions are favorable in the second phase, this effect reverses in the post-2013 period. The coefficients for the interaction term ' $GF*third\ phase$ ' are positive and significant for all global risk factors (columns 1-3), indicating that firms decrease (or increase) their foreign borrowings at times of lower (or higher) risk in global markets. Firms' foreign borrowings decline at times of favorable interest rates in global markets as well (column 4). These effects are also economically significant. Focusing on the VIX in column 1, we find that a one unit reduction in global risk increases foreign borrowings in the second phase by 14%, while it reduces foreign borrowings in the third phase by 3.2%. The p-values at the bottom of the table confirm significant differences between the coefficient values of the interaction terms, and coefficient values of different liquidity phases at 5% level of significance for majority of the global factors. Finally, we continue to find that foreign borrowings are higher in the second phase ('*second phase*') and they decline in the third phase ('*third phase*'), and other control variables behave as conjectured.

In conclusion, we document that although firms tend to increase their foreign borrowings when global financing conditions are favorable in general, changes in global credit conditions affect their ability to do so. In the post-2013 period, as global risk picks up leading to frequent sell-off episodes and increased capital flow volatility in emerging markets, the impact of global factors on firms' foreign borrowings changes resulting in decline of foreign borrowings. Thus, we find evidence of changes in international investors' risk perception towards emerging economies which has significantly altered firms' ability to tap international markets in the post-2013 period. We next turn to the investigation of the potential reasons, and consequences, of these changes during the post-2013.

6. Role of firm heterogeneity in the post taper tantrum period

Having documented important changes in firms' access to global credit across the different phases of global liquidity, we then turn to the investigation of the potential underlying drivers of these developments in global credit. In particular, we ask in the context of increasing risk aversion and uncertainty in global markets during the post-taper tantrum period, whether global investors have become more attentive to the quality of their borrowers as they search for yields in emerging markets.

The studies that analyze the role of firm characteristics on the impact of global financing conditions on firms borrowing abroad mostly focus on the transmission of the US monetary policy to domestic borrowers via international bank lending. Alter and Elekdag (2020) highlight that firms that are most dependent on external finance for their business operations, stand to benefit the most from the accommodative US monetary policy, and would more likely increase their leverage ratios relative to other types of firms. Consistently, Bräuning and Ivashina (2020) and Morais et al. (2019) show that riskier local borrowers benefit the most from relaxing credit conditions in international bank credit following the US accommodative

monetary policy. Focusing on the reduction in credit availability during the taper tantrum episode, Avdjiev and Takats (2014) find that domestic factors such as capital account openness and exposure to USD credit are the main determinants of the capital outflows from emerging markets.

Adding to this argument, we exploit firm heterogeneity to test how firms' access to external credit changes in relation to their creditworthiness. Following Bose, MacDonald, and Tsoukas (2019), we divide the firms in two groups using two main criteria of financial soundness-interest coverage ratio and profitability.¹³ Interest coverage ratio is measured by the ratio of operating income to total interest expenses, and profitability is measured by the ratio of gross profits to total sales. Both measures are indicators of differences in inventory investment and firms' creditworthiness. Firms are classified as high (or low) coverage or profitability if their coverage or profitability ratios are above (or below) the median of the respective distribution of all the firms in that particular year.¹⁴ Hence, we report regressions separately for each group of firms.

Tables 4 and 5 provide the results for firm heterogeneity based on interest coverage and profitability ratios, respectively. The coefficients of the interaction term '*GF*second phase*' using the global financing measures of *VIX* and *interest rate differential* show that during the post-GFC period, it is especially the riskier and less profitable firms that take advantage of the benign global credit conditions. Focusing on the US monetary policy, both Bräuning and Ivashina (2020) and Morais et al. (2019) document that easier monetary policy result in greater access to external financing, especially for the riskier borrowers. While focusing on other

¹³ We also divide firms in two groups based on additional indicators of firm liquidity, size, sectoral asset tangibility, and credit ratings. These results are provided in section 8.3.

¹⁴ As the access to foreign borrowings in global liquidity phases might be related to unobserved within-firm changes, we also classify a firm as high coverage or more profitable in the second and third phases using the 2010 median values which is one year prior to the onset of the two liquidity phases. These results are qualitatively and quantitatively similar to the results reported here. These results are not reported for brevity, but are available from the authors upon request.

global risk factors such as *US corporate yields* and *MOVE*, we find a significant impact of the interaction term '*GF*second phase*' for all firms irrespective of their riskiness. The p-values reported at the bottom of the table for the test of equality of '*GF*second phase*' for the two groups of firms show that there is no significant difference in the impact of benign global credit conditions and global risk between the high and low coverage (or profitable) firms in the second phase.

However, the coefficients of the interaction term '*GF*third phase*' provide a different picture. In particular, we find that the impact of global risk is significant only for high coverage (or profitable) firms, and insignificant for low coverage (or profitable) firms. In particular, firms with higher creditworthiness raise more foreign financing at times of higher global risk and unfavorable global financing conditions in the third phase. To assist with economic interpretation in column 1 of respective tables, we find that a one unit increase in *VIX* increases foreign borrowings in the third phase by approximately 5% for both high coverage and more profitable firms. As global investors resume their search for yields by lending to emerging market borrowers in an environment of higher global risk following the taper tantrum episode, they become more discerning with respect to the quality of their borrowers. Thus, less risky and more profitable firms are able to maintain their access to external finance even as global risk aversion increases in times of heightened uncertainty. The p-values at the bottom of table for the test of equality of the coefficient values for the interaction term '*GF*third phase*' for the two groups of firms show a significant difference in the impact of global credit conditions and global risk between the high and low coverage (or profitable) firms in the third phase at 5% level.

Overall, these findings are in line with the evidence of fundamental changes in global credit dynamics pointing towards a greater importance of borrower-specific factors driving

international bank flows as opposed to global common factors in the post-2013 period (Amiti, McGuire, and Weinstein, 2019; Avdjiev et al., 2020).

7. Credit substitution and real effects on firms in the post-taper tantrum period

We have established that due to increased uncertainty in global markets during the post-taper tantrum period, global investors are more careful about the quality of their borrowers as they search for yields in emerging markets. In this section, we explore whether there is any potential substitution of global credit with regional credit or domestic financing as borrowers are facing tighter global credit conditions in this particular period. Further, we extend our analysis to study the real effects of the documented changes to firms' access to global credit.

7.1 The role of regional lenders

Investigating the reduction in cross-border bank credit in the post-GFC period, Bénétrix et al. (2019) show that the decline is attributable to the deleveraging activities of European banks that have cut back their overseas operations to adjust the risk profile of their balance sheets. In fact, other foreign banks, especially regional ones, have increased their operations abroad in the post-GFC period. The entry of regional banks to fill the gap of the retreating banks from the Euro Area has been observed particularly in the Asian region (Bank for International Settlements, 2014). A report by the International Monetary Fund (2015) highlights the increasing regional linkages in cross-border bank credit in Asia driven by Japanese and Chinese banks.

In order to determine whether this increased regionalization of cross-border lending affects corporate access to foreign credit and provides an alternative to global credit at times of greater capital flow volatility, we include interaction effects between the regional factor and the dummies for second and third phases of global liquidity. We report these results in Table 6. The results show that the coefficients for the interaction term of '*JP vix*second phase*' is

insignificant, while the coefficients for the interaction term of '*JP vix*third phase*' is negative and significant in all the specifications (columns 1-4) showing that regional factors have become relevant in the post-2013 period and firms' foreign borrowings increase when regional risk aversion and uncertainty decline. This result is in line with the evidence of regionalization of international bank credit in the post-2013 period (Bénétrix et al., 2019; Cerutti and Zhou, 2017; Koch and Remolona, 2018).

To assess whether the influence of regional credit overpowers the global credit dynamics, we compare the magnitude of the coefficients of the interaction term of '*JP vix*third phase*' in Table 6 with the interaction term of '*GF*third phase*' in Table 3. We find that the magnitude of the coefficients of '*GF*third phase*' is larger and significantly different at 1% level than the coefficient of '*JP vix*third phase*' in each column of the respective tables, suggesting that although regional linkages become more relevant in the third phase, the impact of global factors is still stronger on firms' foreign borrowings.¹⁵

7.2 The role of domestic credit

As global financing conditions abroad tightened in the third phase, we test the potential substitution of global credit with domestic credit. Few studies have looked at the substitution between different sources of firm financing but find weak evidence. In an additional exercise, Lo Duca, Nicoletti, and Vidal Martínez (2016) find some evidence of substitution of domestic credit in the post-GFC period, although the effect is not strong enough to weaken the impact of the US unconventional monetary policy on corporate bond issuances abroad. Studying the case of Turkey, di Giovanni et al. (2019) find that domestic credit increases when the VIX is low, as an evidence of global credit conditions being transferred to domestic credit markets. In

¹⁵ We also exploit firm heterogeneity for these regressions, and we find that regional lenders also differentiate across borrowers, and the impact of regional factors on foreign borrowings during the third phase is especially relevant for more creditworthy firms, similar to global investors. Hence, we stress the different exposure of firms on global and regional factors depending on their creditworthiness. These results are not reported for brevity but are available upon request.

a cross-country analysis of emerging economies, Bräuning and Ivashina (2020) find no evidence that domestic lenders have taken over the provision of USD credit from foreign banks.

Following Bräuning and Ivashina (2020), we test the potential substitution effect by estimating equation (2) using the dependent variable of ‘*DCB*’ calculated as the natural logarithm of the ratio of proceeds from domestic currency borrowings over total assets. If domestic credit provides the marginal financing that firms cannot access abroad at times of heightened risk aversion in global markets, then domestic credit should present a stronger reaction to global factors in the third phase as compared to foreign credit. We report these results in Table 7 which show that Indian firms’ domestic borrowings are affected by global factors in the same way as foreign borrowings. This confirms that domestic borrowings increase at times of lower global risk during the second phase and they decline at times of higher global risk in the third phase. Overall, these findings do not provide any evidence of substitution between global and domestic credit, but point towards a reinforcing effect of global factors on domestic financing conditions (Gozzi et al., 2015; Serena and Moreno, 2016).

7.3 Real effects on firms due to changes in access to global credit

In this section, we test whether the effect of liquidity phases and the changes in global credit during the third phase affect firms’ real activities. We address this question by re-estimating equations (1-2) using the dependent variable of investment spending calculated as the natural logarithm of the ratio of total capital expenditure to total assets. If the firms are able to secure alternative sources of financing or the impact of global factors on their foreign borrowings is only marginal, then we should not observe any impact of global factors on firms’ investment spending.

The results are reported in Table 8. First, we find that firms’ investments are higher in the second phase (*‘second phase’*), while they decline in the third phase (*‘third phase’*) while controlling for global factors. Then in subsequent columns, we introduce the interaction terms

between the global factors and dummies for different liquidity phases. The coefficients for the interaction term '*GF*second phase*' show that firms' investments increase in the second phase when the risk aversion in global markets is lower and when the interest rate differentials are more favorable. On the contrary, the coefficients of the interaction term '*GF*third phase*' show that firms' investments reduce in the third phase when the risk aversion in global markets is higher and when the interest rate differentials are unfavorable. These results show that global credit dynamics affect not only the availability of financing, but they also impact real activities (Bräuning and Ivashina, 2020). More specifically, when firms struggle to access external finance during the third phase, they reduce their investment spending as well, pointing towards an important real effect of global credit.

8. Robustness Tests

8.1 Alternative dependent variable

In the main analysis, we use a continuous dependent variable that captures the proportion of foreign currency borrowings. In this section, we use a binary variable to capture the probability of issuance of foreign currency borrowings. This dummy takes the value of one if the firm has access to foreign borrowings in a particular year, and zero otherwise. We estimate these models using logit regressions which measure the extent to which global factors affect firms' decision to access global finance.

The results are reported in Table 9 and show that firms' propensity to borrow abroad is higher when global risk is lower and the interest rate differential is larger. We further find that this relationship is stronger during the second phase as compared to the third phase. In the post-2013 period, we confirm the main findings that firms reduce their foreign borrowings at times of lower global risk, and increase their foreign borrowings when global risk is higher.

Moreover, we note that healthier firms with higher coverage ratio and profitability are the ones which increase their foreign borrowings when the global risk is higher in the post-2013 period.

We also find that firms' propensity to borrow abroad is higher when the Japanese VIX is lower, providing evidence for a significant impact of regional factors on firms' borrowings abroad. All other control variables behave as expected. In conclusion, investigating the impact of global factors on the decision of firms to access foreign markets for credit using a binary dependent variable supports our main results.

8.2 Higher frequency time-series analysis

In the main analysis, we employ a firm-level dataset of foreign borrowings at annual frequency that allows us to assess the role of various firm characteristics on the exposure of their external financing to global factors. In this section, we test whether our results are robust to a high-frequency quarterly dataset. Specifically, we use two measures of firms' foreign borrowings as dependent variables- international claims of banks towards Indian non-bank private borrowers (log) and amount outstanding of debt instruments issued abroad by Indian non-financial corporations (log).¹⁶ International claims include cross-border credit and foreign currency credit from local lenders, aggregated at country level. We estimate OLS regressions for these measures on a set of global, regional and domestic factors as identified in equations (1) and (2).

The results are reported in Table 10 and they support our main findings. In Panels A and C, we find that foreign borrowings and external bond issuances increase when global risk factors are lower and interest rate differentials are favorable. Moreover, in Panels B and D, the

¹⁶ The data for the former measure comes from the BIS Consolidated Banking Statistics (CBS) and the latter measure comes from the BIS Debt Securities Statistics. The amount outstanding of debt securities issued abroad is a third of the international claims by banks on average. As international claims by banks include loans as well as debt instruments, and foreign banks are likely holders of debt securities issued abroad, there is some overlap between these two measures.

impact of global risk and interest rate differential declines significantly during the third phase (*GF*third phase*). As expected, we find that firms reduce their foreign borrowings and external bond issuances at times of lower global risk, and increase their foreign borrowings when global risk is higher during the third phase.

In conclusion, we document that firms' foreign borrowings is generally affected by global risk and global financing conditions relative to domestic markets. However, we show that this effect has changed in the post-2013 period. Hence, we confirm the main finding that global credit dynamics significantly affect local firms' ability to access external finance using high-frequency time-series data.

8.3 Additional tests for firm heterogeneity

In the main analysis, we classify our firms into two groups based on the median value of interest coverage and profitability ratios. To ensure that our results are not due to the sample division, we carry out two additional tests. First, we use the 75th percentile as an alternative cut-off point for both criteria. Second, we focus on four more dimensions of firm heterogeneity based on liquidity, size, sectoral asset tangibility, and credit ratings. Sectoral asset tangibility is the share of net property, plant, and equipment in total book-value assets of all publicly listed US-based companies which are averaged over 2000-2010 for the median firm in each industry (Manova 2013).¹⁷ Firms are considered less (or more) risky if liquidity, size and sectoral asset tangibility are above (or below) the median of the respective distribution of all the firms in that particular year. Further, we use credit ratings assigned by rating agency to classify firms as safe and risky.

¹⁷ Using the US firms as the reference country is convenient because of limited data for many other countries and it also ensures that the measures are not endogenous to financial development. Rajan and Zingales (1998) also argue that this measure captures a large technological component that is innate to the manufacturing process in a sector and are thus good proxies for ranking industries in all countries. This dataset is obtained from Compustat's annual files.

We then re-estimate the models in Tables 4 and 5 and report the results of alternative cut-off point in Table 11, and alternative measures of firm heterogeneity in Table 12. The results confirm that less risky (or safer) firms, irrespective of the definition used, increase their foreign borrowings in the third phase when the global financing conditions are more uncertain. Thus, our main findings are robust to alternative tests on firm heterogeneity.

8.4 Endogeneity concerns

We use instrumental variable estimations such as two-staged least squares (2SLS) to tackle endogeneity problems. The specifications in the main models already use independent variables lagged by one year to reduce endogeneity. Further in the absence of suitable instruments, we use lagged independent variables as instruments and all the firm-level variables are treated as endogenous. The validity and relevance of the instruments are verified using a number of diagnostic tests. The under-identification test is distributed as chi-square under the null of under-identification. The Hansen J statistic is a test of the over-identifying restrictions, distributed as chi-square under the null of instrument validity.

The results are provided in Table 13 and show that firms' foreign borrowings are higher when global risk is lower and the interest rate differential is larger. We further find that this relationship is stronger during the second phase as compared to the third phase. In the post-2013 period, we confirm the main findings that firms reduce their foreign borrowings at times of lower global risk, and increase their foreign borrowings when global risk is higher. Moreover, we note that healthier firms with higher coverage ratio and profitability are the ones which increase their foreign borrowings when global risk is higher in the post-2013 period.

9. Conclusion

Global credit has experienced significant changes in the last two decades. Credit provision in global markets has been affected by the GFC and the monetary policy responses in the main

financial systems since then. After the particularly benign global credit environment in the post-GFC period that unleashed abundant financing towards emerging markets, capital flows have started to experience greater volatility since the 2013 taper tantrum episode. These sell-off episodes are frequently triggered by disappointing economic news and uncertainty around the economic outlook of emerging markets. Most recently, the Covid-19 crisis caused record capital outflows from emerging markets in the first quarter of 2020.

Exploiting a panel dataset of foreign borrowings by Indian firms, we show that in general firms take advantage of global credit as they increase their foreign borrowings when international financial conditions are favorable. However, we show that the significant increase in foreign borrowings driven by favorable credit conditions occurs mainly in the post-GFC period. This was a period characterized by abundant liquidity provided to riskier borrowers by international investors with low risk aversion in search for yields. Starting with the 2013 taper tantrum, as international investors' risk aversion and capital flow volatility increased, firms' ability to access external finance to take advantage of favorable credit conditions have declined.

Hence, changes in global credit conditions have altered firms' access to financing abroad since 2013. Importantly, we find that less risky and more profitable firms are increasing their foreign borrowings even at the times of higher global risk, as opposed to their counterparts. Moreover, we show that increasing linkages with regional lenders and particularly with Japanese banks do not fully offset the exposure of firms' foreign borrowings to global factors originating in the US, possibly due to the predominance of USD intermediation by regional lenders. Further, we find that instead of providing an alternative source of financing in times of tighter global financing conditions, domestic credit increases when global risk is lower and declines when global risk is higher suggesting a reinforcing effect to foreign borrowings. Finally, the impact of changing global credit conditions is documented and we find that firms' investment spending declines at times of higher global risk during the post-2013 phase.

Understanding the exposure of the domestic corporate sector to global credit conditions is the key to manage the build-up of vulnerabilities driven by changes in external conditions over which domestic authorities have little to no control. Monetary authorities face particular challenges while monitoring the build-up of credit originating from corporates, especially via foreign borrowings. Thus, even though global credit improves borrowers' access to external finance, they also pose threats to the financial stability of economies.

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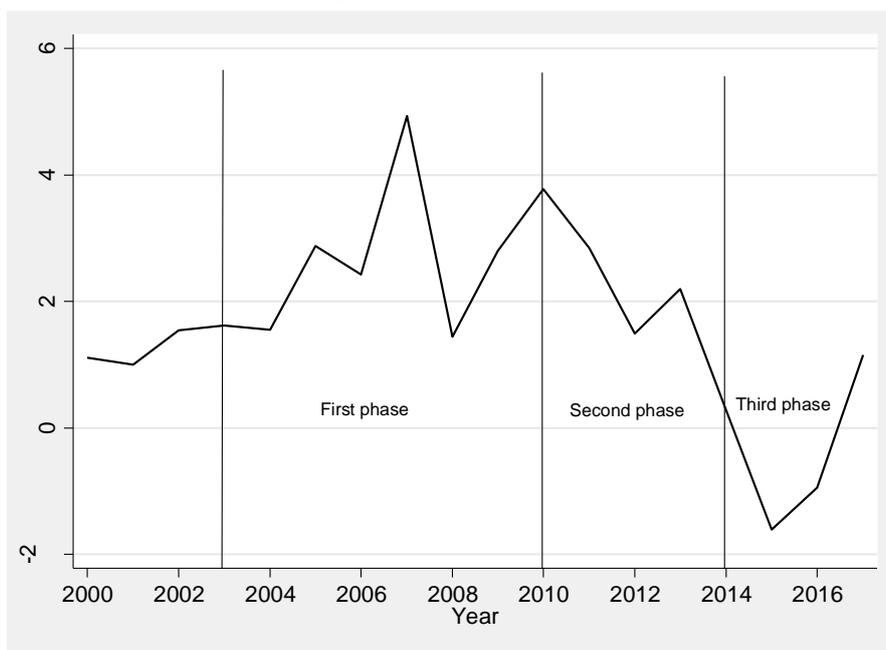
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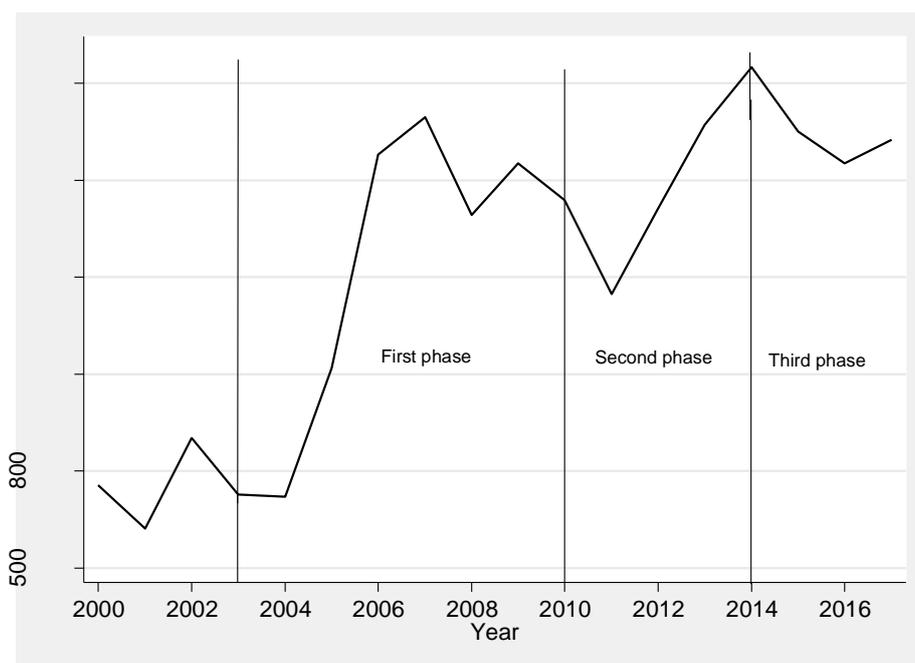
Figure 1: Net capital inflows to emerging markets



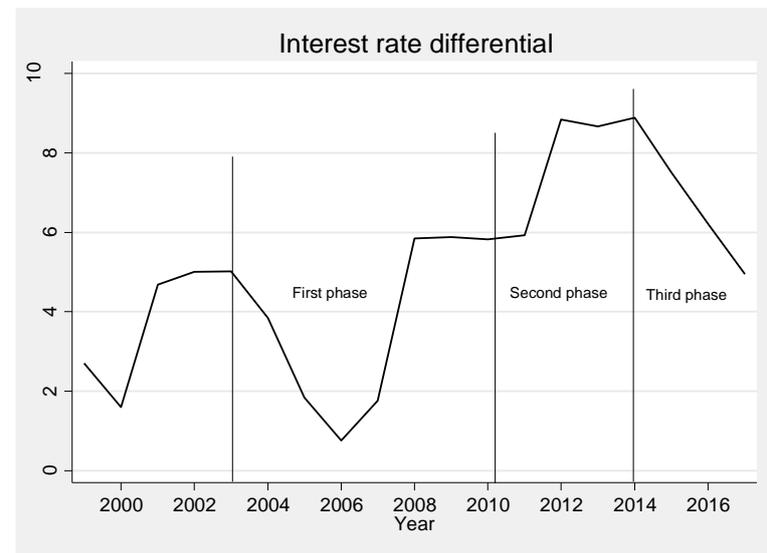
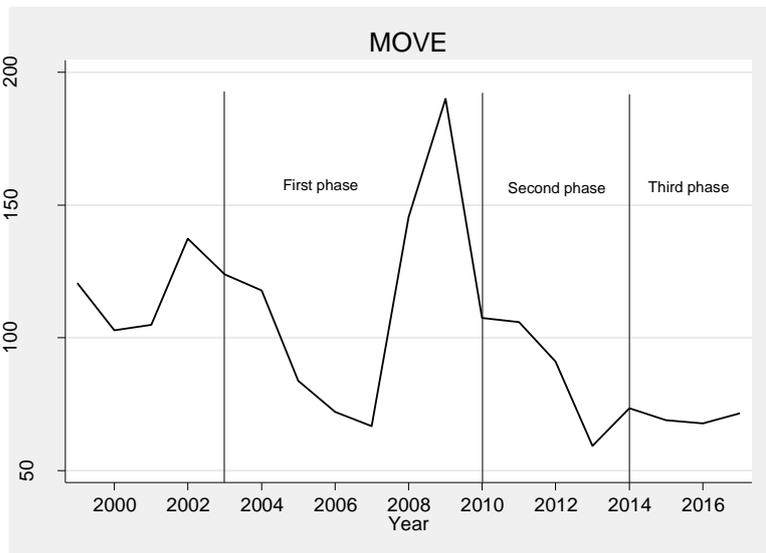
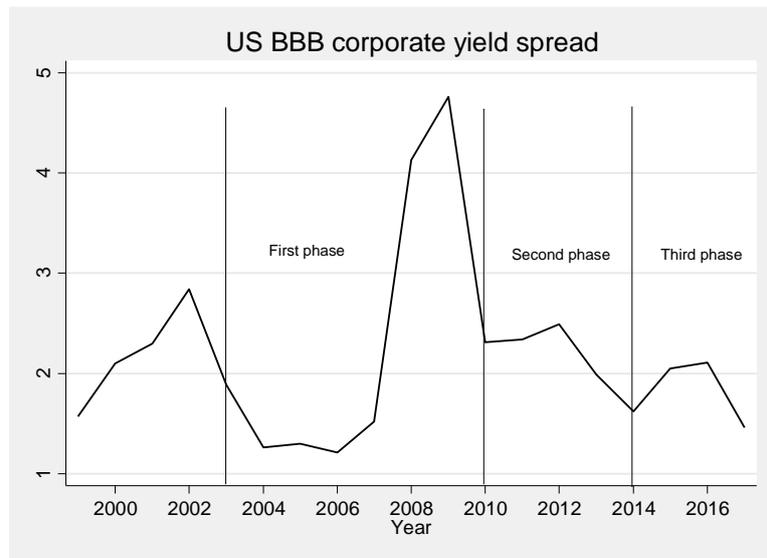
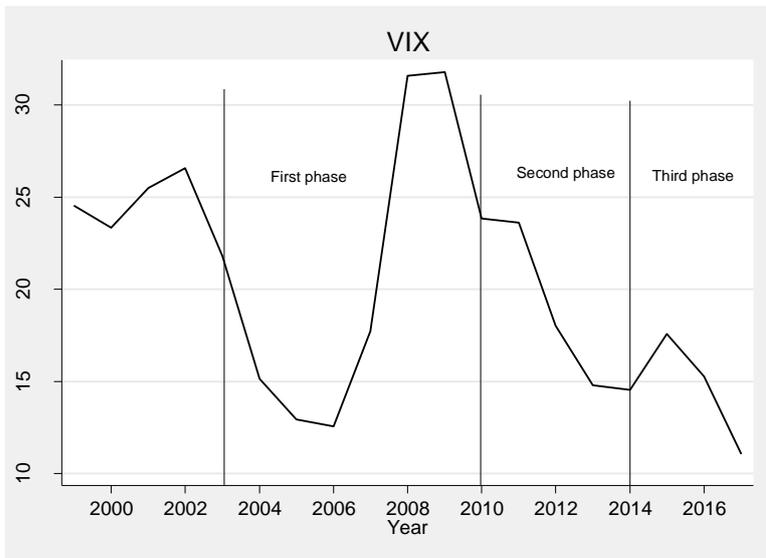
Notes: The figure reports the average of net capital inflows as a share of GDP for a set of 44 emerging markets. Net capital inflows are defined as the difference between capital inflows (non-residents net purchases of domestic assets) and capital outflows (residents net purchases of foreign assets, excluding reserve assets) and they are measured as a country's financial account balance, net of changes in reserves, scaled by GDP. Data is obtained from the IMF's Balance of Payment (BOP) database.

Figure 2: Foreign borrowings and global conditions over 2000-2017

(a) Foreign currency borrowings by Indian firms (in million rupees)



(b) Global financing conditions



Notes: The figure reports the foreign borrowings (in INR million) by Indian firms during the three phases of global liquidity in Panel A. Panel B reports the global financing conditions as measured by four standard measures, namely the VIX, the US BBB-rated corporate bond yields, the MOVE index, and the interest rate differential between India and the US.

Table 1: Summary statistics of all variables

Variables	(1) Whole sample	(2) Second phase	(3) Third phase	(4) p-values
FCB	0.14 (0.24)	0.13 (0.18)	0.10 (0.14)	0.015
DCB	0.21 (0.17)	0.18 (0.14)	0.18 (0.15)	0.238
Investment spending	0.30 (0.20)	0.31 (0.20)	0.28 (0.19)	0.001
VIX (log)	2.96 (0.32)	3.02 (0.19)	2.66 (0.16)	0.000
US BBB-rate corporate yields (log)	0.75 (0.41)	0.83 (0.07)	0.59 (0.16)	0.000
MOVE (log)	4.58 (0.33)	4.53 (0.22)	4.25 (0.03)	0.000
Interest rate differential	5.14 (2.30)	7.01 (1.41)	6.75 (1.43)	0.000
JP VIX	23.85 (7.71)	21.22 (1.55)	21.99 (2.48)	0.000
Firm size	6.10 (2.09)	6.27 (2.14)	7.24 (2.03)	0.000
Liquidity	2.79 (8.24)	1.85 (6.27)	2.51 (7.75)	0.000
Tangibility	0.31 (0.24)	0.29 (0.24)	0.28 (0.24)	0.000
Exporting firm	0.69 (0.46)	0.74 (0.44)	0.49 (0.50)	0.000
GDP growth	7.45 (1.97)	7.54 (1.96)	7.29 (0.49)	0.000
Stock market return	0.01 (0.03)	0.005 (0.02)	0.010 (0.01)	0.000
Currency returns	49.81 (7.65)	49.90 (4.95)	64.70 (2.28)	0.000
External debt ratio	19.11 (2.16)	19.71 (2.26)	21.11 (1.51)	0.000

Notes: The table reports the statistics of all variables used in the estimated models for the whole sample, second and third phases of global liquidity. Second phase of liquidity is the period from 2010 to 2013, and third phase is from 2014-2017. P-values indicate significance of mean differences for each characteristic. *FCB* is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets. *DCB* is the natural logarithm of the ratio of proceeds from domestic currency borrowings over total assets. *Investment spending* is calculated as the ratio of as the natural logarithm of the ratio of total capital expenditure over total assets. *VIX (log)* is the implied volatility in the S&P500 option prices. *US BBB-rated corporate bond yields (log)* measures the perceived riskiness of investment grade corporate bond issuances in the US. *MOVE (log)* is the bond market equivalent to the VIX and is calculated as the implied volatility in US treasuries at various maturities. *Interest rate differential* is calculated as the difference between annual short-term money market interest rates in India relative to the US. *JP VIX* is a proxy for investor uncertainty in financial markets in Japan. *Firm size* is defined as the logarithm of total real assets. *Liquidity* is measured as the ratio of quick assets to quick liabilities. *Tangibility* is defined as the ratio of net fixed assets to total real assets. *Exporting firm* is a dummy for firms with positive exports, and zero otherwise. *GDP growth* is the real domestic annual growth in GDP of domestic economy. *Stock market returns* are the annual returns of the stock market index of the Indian stock exchange. *Currency returns* is the exchange rate return of the Indian rupee vs the US dollar. *External debt ratio* is the share of external debt to GDP.

Table 2: Impact of global financing conditions on foreign currency borrowings

Dependent variable:	FCB			
	(1) GF= VIX	(2) GF= US corporate yields	(3) GF= MOVE	(4) GF= Interest rate differential
GF	-0.036*** (-3.12)	-0.026** (-2.33)	-0.035*** (-4.21)	0.004*** (2.76)
Second phase (i)	0.048*** (4.83)	0.042*** (3.64)	0.022*** (3.11)	0.016** (2.01)
Third phase (ii)	-0.040*** (-4.00)	-0.047*** (-3.83)	-0.017** (-2.44)	-0.030*** (-3.32)
JP VIX	-0.001** (-2.20)	-0.001 (-0.32)	-0.001*** (-2.83)	-0.001** (-2.15)
Firm size	-0.001 (-0.02)	-0.001 (-0.08)	-0.008 (-0.91)	-0.002 (-0.38)
Liquidity	0.003*** (2.68)	0.003*** (2.71)	0.003*** (2.60)	0.003*** (2.66)
Tangibility	0.005 (0.28)	0.003 (0.18)	0.003 (0.12)	0.008 (0.41)
Exporting firm	-0.005 (-0.69)	-0.004 (-0.57)	-0.001 (-0.14)	-0.004 (-0.50)
GDP growth	-0.001 (-0.02)	-0.001 (-0.34)	0.001 (0.10)	0.001 (0.76)
Stock market return	0.039 (0.87)	0.023 (0.42)	0.011 (0.14)	0.168*** (2.67)
Currency returns	-0.002*** (-3.42)	-0.002*** (-2.90)	-0.002*** (-2.76)	-0.001* (-1.81)
External debt ratio	-0.003*** (-3.55)	-0.003*** (-2.69)	-0.001 (-0.78)	-0.005*** (-3.50)
Constant	0.270*** (4.65)	0.180*** (3.60)	0.443*** (7.16)	0.118** (2.00)
Observations	3,825	3,825	3,825	3,825
R-squared	0.092	0.089	0.067	0.086
Number of firms	1,076	1,076	1,076	1,076
Test of equality (p-values): (i) and (ii)	0.000	0.000	0.001	0.003
Firm FE	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust *t*-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 3: Global financing conditions during the different phases of global liquidity

Dependent variable:	FCB			
	(1) GF= VIX	(2) GF= US corporate yields	(3) GF= MOVE	(4) GF= Int. rate differential
GF*second phase (i)	-0.140** (-1.97)	-0.127*** (-3.49)	-0.041*** (-2.81)	-0.001 (-0.32)
GF*third phase (ii)	0.032** (2.15)	0.085*** (2.95)	0.197*** (2.81)	-0.001** (-2.07)
Second phase (iii)	0.413* (1.84)	0.093*** (2.94)	0.170*** (2.81)	-0.020 (-1.30)
Third phase (iv)	-0.043 (-1.01)	-0.021** (-2.45)	-0.849*** (-2.80)	-0.054*** (-2.72)
GF	0.009 (0.36)	0.002 (0.16)	-0.030** (-2.26)	0.004*** (2.72)
JP VIX	0.001 (0.20)	-0.002*** (-4.16)	-0.001** (-2.39)	-0.001*** (-4.50)
Firm size	-0.008 (-0.85)	-0.002 (-0.29)	-0.002 (-0.38)	-0.002 (-0.34)
Liquidity	0.002** (2.44)	0.003*** (2.73)	0.003*** (2.66)	0.003*** (2.60)
Tangibility	-0.001 (-0.05)	0.008 (0.39)	0.009 (0.49)	0.010 (0.50)
Exporting firm	-0.003 (-0.31)	-0.005 (-0.73)	-0.006 (-0.86)	-0.005 (-0.69)
GDP growth	-0.001 (-0.07)	0.013*** (3.64)	0.004* (1.68)	0.004 (1.59)
Stock market return	0.162* (1.76)	-0.029 (-0.25)	0.111 (1.38)	0.018 (0.16)
Currency returns	-0.004*** (-2.81)	-0.003*** (-2.86)	-0.002** (-2.26)	0.001 (0.55)
External debt ratio	-0.001 (-0.78)	-0.008*** (-3.28)	-0.004** (-2.33)	-0.004*** (-2.84)
Constant	0.372*** (4.57)	0.550*** (5.86)	0.447*** (4.12)	0.063 (0.77)
Observations	3,825	3,825	3,825	3,825
R-squared	0.071	0.089	0.091	0.091
Number of firms	1,076	1,076	1,076	1,076
Test of equality (p-values):				
(i) and (ii)	0.028	0.000	0.002	0.899
(iii) and (iv)	0.024	0.001	0.002	0.284
Firm FE	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 4: Firm heterogeneity based on interest coverage ratio

Dependent variable:	FCB							
	(1) GF= VIX	(2)	(3) GF= US corporate yields	(4)	(5) GF= MOVE	(6)	(7) GF= Int. rate differential	(8)
	High coverage ratio	Low coverage ratio	High coverage ratio	Low coverage ratio	High coverage ratio	Low coverage ratio	High coverage ratio	Low coverage ratio
GF*second phase (i)	-0.085 (-1.18)	-0.196** (-2.35)	-0.146*** (-3.30)	-0.030** (-2.32)	-0.016*** (-4.33)	-0.189** (-2.10)	-0.006 (-1.36)	0.010* (1.81)
GF*third phase (ii)	0.048*** (3.39)	0.016 (0.62)	0.129*** (3.31)	-0.009 (-0.21)	0.251*** (3.41)	-0.696* (-1.88)	-0.001** (-2.20)	0.002 (1.60)
Second phase (iii)	0.241 (1.09)	0.605** (2.34)	0.118*** (3.04)	0.020** (2.02)	0.040*** (4.14)	0.901** (2.11)	-0.002 (-0.08)	0.057* (1.91)
Third phase (iv)	-0.116** (-2.54)	-0.055 (-0.81)	-0.029*** (-2.69)	-0.004 (-0.19)	-1.144*** (-3.53)	-3.167* (1.90)	-0.091*** (-3.07)	0.039 (1.15)
GF	-0.019 (-0.78)	-0.047* (-1.75)	-0.007 (-0.59)	-0.033** (-2.09)	-0.012 (-0.75)	0.031 (0.94)	-0.002 (-0.63)	0.005 (1.53)
JP VIX	0.001 (0.98)	-0.001* (-1.87)	-0.002*** (-3.22)	-0.002** (-2.53)	-0.003*** (-3.12)	-0.001 (-1.01)	-0.002*** (-4.99)	-0.001 (-0.97)
Firm size	-0.012 (-1.13)	-0.003 (-0.69)	-0.014 (-1.30)	-0.003 (-0.65)	-0.014 (-1.33)	-0.003 (-0.66)	-0.014 (-1.33)	-0.004 (-0.79)
Liquidity	0.003** (2.02)	0.004*** (2.95)	0.003** (2.10)	0.004*** (2.90)	0.003** (1.98)	0.004*** (3.03)	0.003** (2.02)	0.004*** (2.93)
Tangibility	-0.043 (-1.60)	0.013 (0.48)	0.045* (1.68)	0.012 (0.46)	-0.039 (-1.42)	0.012 (0.46)	-0.041 (-1.50)	0.014 (0.55)
Exporting firm	0.006 (0.69)	0.001 (0.12)	0.006 (0.66)	0.005 (0.48)	0.005 (0.55)	0.004 (0.37)	0.005 (0.50)	-0.004 (-0.36)
GDP growth	-0.003 (-1.01)	0.004 (0.95)	0.017*** (3.50)	-0.001 (-0.18)	0.007* (1.74)	0.014** (2.27)	0.007** (2.06)	-0.003 (-0.68)
Stock market return	0.130 (1.21)	0.247* (1.69)	-0.124 (-0.84)	0.306* (1.69)	0.585*** (3.79)	0.901*** (3.02)	-0.141 (-0.99)	0.381** (2.05)
Currency returns	-0.003** (-2.11)	-0.004** (-2.00)	-0.003*** (-2.61)	0.001 (1.13)	-0.001 (-0.12)	-0.009** (-2.26)	0.002 (1.23)	-0.002 (-1.35)
External debt ratio	-0.002 (-1.18)	-0.001 (-0.21)	-0.012*** (-3.40)	-0.003 (-0.97)	-0.007** (-2.50)	-0.001 (-0.49)	0.002 (1.03)	-0.003 (-1.16)
Constant	0.491*** (5.70)	0.183* (1.83)	0.785*** (6.66)	0.133 (1.02)	0.197 (1.14)	0.544*** (3.38)	0.130 (1.06)	0.299*** (2.74)
Observations	2,321	1,504	2,321	1,504	2,321	1,504	2,321	1,504
R-squared	0.169	0.049	0.162	0.050	0.174	0.049	0.164	0.048
Number of firms	798	609	798	609	798	609	798	609
Test of equality (p-values):								
GF*second phase		0.223		0.134		0.121		0.153
GF*third phase		0.004		0.021		0.002		0.004
(i) and (ii)	0.082	0.021	0.000	0.622	0.000	0.078	0.260	0.094
(iii) and (iv)	0.072	0.022	0.001	0.317	0.000	0.076	0.065	0.102
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Firms are classified into high (or low) coverage if their coverage ratios are above (or below) the median of the entire distribution of all the firms in that particular year. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 5: Firm heterogeneity based on profits

Dependent variable:	FCB							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	GF= VIX		GF= US corporate yields		GF= MOVE		GF= Int. rate differential	
	High profits	Low profits	High profits	Low profits	High profits	Low profits	High profits	Low profits
GF*second phase (i)	-0.078 (-1.09)	-0.009** (-2.07)	-0.171*** (-3.81)	-0.032** (-2.14)	-0.018*** (-5.13)	-0.187* (-1.76)	-0.005 (-1.35)	0.015* (1.94)
GF*third phase (ii)	0.051*** (3.44)	-0.003 (-0.48)	0.146*** (3.79)	0.035 (0.70)	0.237*** (3.03)	-0.749* (-1.75)	-0.002*** (-2.73)	0.009 (1.62)
Second phase (iii)	0.217 (0.99)	-0.002 (-0.20)	0.140*** (3.50)	0.010 (1.23)	0.048*** (5.22)	0.871* (1.71)	-0.001 (-0.05)	-0.084** (-2.12)
Third phase (iv)	-0.135*** (-2.90)	-0.012 (-0.89)	-0.025** (-2.35)	-0.015 (-0.63)	-1.080*** (-3.17)	-3.379* (-1.74)	-0.082*** (-2.95)	-0.027** (-2.48)
GF	-0.023 (-0.97)	0.010 (0.47)	-0.003 (-0.29)	0.010 (0.37)	-0.016 (-1.04)	0.027 (0.67)	-0.002 (-1.04)	-0.001 (-0.07)
JP VIX	0.001 (1.17)	-0.001 (-1.47)	-0.002*** (-4.65)	-0.001* (-1.71)	-0.003*** (-3.80)	0.001 (0.35)	-0.002*** (-5.12)	0.001 (0.63)
Firm size	-0.003 (-0.43)	-0.001 (-0.15)	-0.005 (-0.59)	-0.001 (-0.11)	-0.005 (-0.70)	-0.002 (-0.30)	-0.005 (-0.65)	-0.002 (-0.34)
Liquidity	0.003** (2.30)	0.003** (2.12)	0.003** (2.37)	0.003** (2.14)	0.003** (2.23)	0.003** (2.13)	0.003** (2.29)	0.003** (2.11)
Tangibility	-0.016 (-0.55)	0.026 (1.07)	-0.016 (-0.57)	0.026 (1.05)	-0.011 (-0.37)	0.027 (1.11)	-0.013 (-0.46)	0.027 (1.11)
Exporting firm	-0.004 (-0.40)	0.001 (0.15)	-0.003 (-0.31)	0.001 (0.11)	-0.005 (-0.47)	0.002 (0.23)	0.007 (0.61)	-0.009 (-0.78)
GDP growth	-0.002 (-0.83)	-0.002 (-1.30)	0.019*** (4.17)	-0.005 (-0.87)	0.008** (2.02)	0.016** (2.30)	0.006* (1.74)	0.013* (1.94)
Stock market return	0.158 (1.45)	0.277* (1.67)	-0.092 (-0.61)	0.080 (0.34)	0.675*** (4.54)	0.902** (2.54)	-0.102 (-0.69)	0.743** (2.41)
Currency returns	-0.002* (-1.75)	-0.001 (-0.49)	-0.004*** (-3.04)	-0.001 (-0.85)	-0.001 (-0.31)	-0.010** (-2.00)	0.002 (1.18)	-0.006** (-2.56)
External debt ratio	-0.003 (-1.41)	0.001 (0.65)	-0.014*** (-4.08)	-0.003 (-0.90)	-0.008*** (-3.06)	-0.002 (-0.56)	0.003 (1.16)	0.001 (0.08)
Constant	0.403*** (5.38)	0.139* (1.66)	0.775*** (6.59)	0.297* (1.89)	0.131 (0.84)	0.605*** (3.03)	0.050 (0.48)	0.472*** (3.15)
Observations	2,388	1,437	2,388	1,437	2,388	1,437	2,388	1,437
R-squared	0.142	0.046	0.135	0.044	0.146	0.048	0.133	0.045
Number of firms	802	592	802	592	802	592	802	592
Test of equality (p-values):								
GF*second phase		0.313		0.317		0.121		0.478
GF*third phase		0.000		0.046		0.016		0.046
(i) and (ii)	0.087	0.484	0.000	0.233	0.001	0.086	0.314	0.072
(iii) and (iv)	0.073	0.607	0.000	0.314	0.001	0.085	0.078	0.021
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Firms are classified into high (or low) profits if their profitability ratios are above (or below) the median of the entire distribution of all the firms in that particular year. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 6: Role of regional factors

Dependent variable:	FCB			
	(1) GF= VIX	(2) GF= US corporate yields	(3) GF= MOVE	(4) GF= Int. rate differential
JP vix*second phase (i)	-0.001 (-1.43)	-0.002 (-1.53)	-0.001 (-1.14)	-0.001 (-0.71)
JP vix*third phase (ii)	-0.001** (-2.02)	-0.002** (-2.47)	-0.001** (-2.15)	-0.001** (-2.49)
Second phase (iii)	0.024** (2.05)	0.014 (0.38)	0.033*** (3.00)	0.030* (1.65)
Third phase (iv)	-0.034** (-2.11)	-0.012 (-0.39)	-0.032** (-2.22)	-0.042** (-2.45)
GF	-0.017** (-2.01)	-0.006 (-0.27)	-0.015* (-1.66)	-0.003 (-0.80)
JP VIX	-0.001 (-0.66)	-0.002 (-0.91)	-0.001 (-0.56)	-0.001 (-0.33)
Firm size	-0.007 (-0.79)	-0.008 (-0.77)	-0.007 (-0.77)	-0.007 (-0.81)
Liquidity	0.002** (2.38)	0.002** (2.40)	0.002** (2.37)	0.002** (2.35)
Tangibility	-0.002 (-0.07)	-0.001 (-0.01)	-0.002 (-0.08)	-0.001 (-0.04)
Exporting firm	-0.001 (-0.07)	-0.002 (-0.17)	-0.001 (-0.04)	0.001 (0.04)
GDP growth	-0.001 (-0.33)	0.007 (0.97)	-0.001 (-0.51)	0.002 (0.61)
Stock market return	0.119 (1.57)	0.443 (1.61)	0.056 (0.78)	0.176** (2.49)
Currency returns	-0.001 (-0.05)	-0.001 (-0.48)	-0.001 (-0.10)	0.001 (1.05)
External debt ratio	0.001 (0.63)	0.009 (1.29)	0.001 (0.05)	0.003 (1.52)
Constant	0.241** (2.36)	0.051 (0.50)	0.282*** (2.75)	0.099 (1.03)
Observations	3,825	3,825	3,825	3,825
R-squared	0.069	0.071	0.069	0.069
Number of firms	1,076	1,076	1,076	1,076
Test of equality (p-values):				
(i) and (ii)	0.093	0.798	0.038	0.020
(iii) and (iv)	0.191	0.023	0.972	0.099
Firm FE	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. JP VIX is the risk aversion and uncertainty on Japanese financial markets and it captures the effect of cross-border credit from regional lenders. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 7: Role of domestic credit

Dependent variable:	DCB			
	(1) GF= VIX	(2) GF= US corporate yields	(3) GF= MOVE	(4) GF= Int. rate differential
GF*second phase (i)	-0.130*** (-9.60)	-0.100*** (-10.21)	-0.006*** (-8.33)	0.004*** (5.52)
GF*third phase (ii)	0.047*** (8.92)	0.043*** (6.21)	0.159*** (5.34)	-0.001** (-2.02)
Second phase (iii)	0.389*** (9.11)	0.083*** (9.64)	0.005** (2.16)	0.047*** (7.51)
Third phase (iv)	-0.063*** (-5.51)	-0.009*** (-3.26)	-0.707*** (-5.57)	0.003 (0.82)
GF	0.033*** (7.87)	0.002 (1.09)	0.013*** (4.17)	0.003*** (8.62)
JP VIX	0.001*** (4.70)	0.001*** (6.07)	0.001*** (5.10)	0.001** (2.23)
Firm size	0.009*** (6.31)	0.009*** (6.51)	0.010*** (7.64)	0.011*** (7.86)
Liquidity	-0.001*** (-4.60)	-0.001*** (-4.68)	-0.001*** (-4.63)	-0.001*** (-4.40)
Tangibility	0.055*** (8.97)	0.055*** (8.95)	0.053*** (8.63)	0.053*** (8.70)
Exporting firm	0.006*** (2.81)	0.006*** (2.75)	0.006*** (2.82)	0.005** (2.57)
GDP growth	0.003*** (5.28)	0.002*** (4.86)	0.006*** (9.18)	0.004*** (8.03)
Stock market return	0.103*** (5.42)	0.127*** (7.92)	0.223*** (9.06)	-0.178*** (-7.20)
Currency returns	-0.002*** (-7.43)	-0.001*** (-4.40)	-0.001*** (-5.29)	-0.001* (-1.66)
External debt ratio	-0.005*** (-9.96)	-0.003*** (-5.63)	0.001 (0.84)	-0.005*** (-12.71)
Constant	0.214*** (11.45)	0.196*** (11.14)	-0.011 (-0.43)	0.189*** (14.23)
Observations	98,306	98,306	98,306	98,306
R-squared	0.015	0.015	0.014	0.016
Number of firms	16,141	16,141	16,141	16,141
Test of equality (p-values):				
(i) and (ii)	0.000	0.000	0.000	0.000
(iii) and (iv)	0.000	0.000	0.000	0.000
Firm FE	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'DCB' is the natural logarithm of the ratio of domestic borrowings over total assets. GF refers to the global factors such the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 8: Real effects on firm investments

Dependent variable:	Investment spending							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	GF= VIX		GF= US corporate yields		GF= MOVE		GF= Int. rate differential	
GF*second phase (i)	-	0.121** (2.26)	-	0.153** (2.38)	-	0.084** (2.19)	-	-0.013*** (-5.41)
GF*third phase (ii)	-	-0.063** (-2.03)	-	-0.127*** (-3.51)	-	-0.017*** (-4.67)	-	0.016* (1.93)
Second phase (iii)	0.045*** (4.94)	0.432** (2.57)	0.044*** (4.29)	0.195*** (3.32)	0.060*** (4.24)	0.477*** (2.65)	0.059*** (4.65)	0.046*** (3.69)
Third phase (iv)	-0.049*** (-3.06)	0.017 (0.21)	-0.077*** (-4.50)	-0.079*** (-3.71)	-0.104*** (-5.44)	-0.162*** (-4.39)	-0.043** (-2.53)	-0.241*** (-3.24)
GF	-0.035** (-2.57)	-0.034* (-1.96)	-0.036*** (-3.22)	-0.026* (-1.95)	-0.008 (-0.74)	-0.010 (-0.50)	0.004** (2.53)	0.008** (2.51)
JP VIX	-0.001*** (-2.86)	-0.001 (-0.10)	-0.001*** (-2.67)	-0.001*** (-2.68)	-0.001 (-0.93)	-0.002** (-2.37)	-0.002*** (-3.17)	-0.004*** (-6.14)
Firm size	0.054*** (5.30)	0.052*** (5.08)	0.053*** (5.13)	0.053*** (5.12)	0.054*** (5.40)	0.053*** (5.33)	0.054*** (5.44)	0.047*** (4.59)
Liquidity	0.005*** (5.75)	0.005*** (5.77)	0.005*** (5.75)	0.005*** (5.74)	0.005*** (5.78)	0.005*** (5.78)	0.005*** (5.78)	0.005*** (5.80)
Tangibility	1.863*** (35.55)	1.860*** (35.45)	1.861*** (35.51)	1.861*** (35.50)	1.865*** (35.62)	1.864*** (35.58)	1.864*** (35.58)	1.814*** (35.06)
Exporting firm	0.048*** (4.16)	0.043*** (3.62)	0.048*** (4.09)	0.046*** (3.91)	0.047*** (3.99)	0.048*** (4.10)	0.046*** (3.93)	0.073*** (6.10)
GDP growth	0.007*** (2.58)	0.004 (1.25)	0.002 (0.66)	0.011*** (3.10)	0.006** (2.42)	0.008*** (3.07)	0.009*** (3.87)	0.013*** (3.90)
Stock market return	0.157 (1.13)	0.239 (1.63)	0.083 (0.68)	0.299** (1.96)	0.418*** (3.22)	0.278*** (2.85)	0.519*** (4.61)	0.504*** (3.74)
Currency returns	-0.001 (-1.05)	-0.002 (-1.45)	-0.001 (-0.73)	-0.002* (-1.66)	-0.001 (-1.06)	-0.007*** (-5.12)	-0.001 (-1.40)	-0.004*** (-3.45)
External debt ratio	-0.004** (-1.98)	-0.016*** (-6.04)	-0.012*** (-8.19)	-0.020*** (-8.01)	-0.013*** (-5.68)	-0.010*** (-3.77)	-0.004** (-2.12)	-0.002 (-0.67)
Constant	-2.067*** (-21.64)	-2.489*** (-23.03)	-2.390*** (-30.78)	-2.718*** (-24.15)	-2.554*** (-26.09)	-2.716*** (-21.10)	-2.179*** (-28.74)	-2.370*** (-28.44)
Observations	130,788	130,788	130,788	130,788	130,788	130,788	130,788	130,788
R-squared	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
Number of firms	19,494	19,494	19,494	19,494	19,494	19,494	19,494	19,494
Test of equality (p-values):								
(i) and (ii)	-	0.002	-	0.000	-	0.009	-	0.000
(iii) and (iv)	0.000	0.005	0.007	0.019	0.001	0.035	0.003	0.000
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable is investment spending calculated as the natural logarithm of the ratio of total capital expenditure over total assets. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**), and 10% (*).

Table 9: Robustness: Logit estimations

Dependent variable:	FCB							
	(1) GF= VIX		(2) GF= US corporate yields		(3) GF= MOVE		(4) GF= Int. rate differential	
Panel A:								
GF	-0.410*** (-2.88)		-0.498*** (-5.59)		-0.445* (-1.82)		0.186*** (8.76)	
JP VIX	-0.037*** (-4.07)		-0.011*** (-2.83)		-0.039*** (-4.10)		-0.022*** (-5.67)	
Observations	12,248		12,248		12,248		12,248	
Number of firms	1,007		1,007		1,007		1,007	
Firm FE	Yes		Yes		Yes		Yes	
Panel B:								
GF*second phase (i)	-8.914*** (-10.81)		-0.317 (-1.62)		-1.509*** (-3.43)		0.003 (0.08)	
GF*third phase (ii)	1.692*** (4.96)		1.026** (2.35)		0.442*** (4.69)		-0.170*** (-6.02)	
Observations	12,248		12,248		12,248		12,248	
Number of firms	1,007		1,007		1,007		1,007	
Test of equality (p-values) (i) and (ii)	0.000		0.006		0.000		0.003	
Firm FE	Yes		Yes		Yes		Yes	
Panel C:								
	(1) High coverage ratio	(2) Low coverage ratio	(3) High coverage ratio	(4) Low coverage ratio	(5) High coverage ratio	(6) Low coverage ratio	(7) High coverage ratio	(8) Low coverage ratio
GF*second phase (i)	-8.746*** (-7.61)	-7.825*** (-5.45)	-0.534** (-2.03)	-6.929** (-2.17)	-1.293** (-2.13)	-6.169*** (-6.06)	0.057 (1.07)	-0.130 (-1.06)
GF*third phase (ii)	2.298*** (4.92)	0.953 (1.55)	1.537** (2.54)	-0.635 (-0.88)	0.379*** (2.93)	-7.626 (-1.56)	-0.175*** (-4.51)	0.439*** (2.64)
Observations	7,026	3,214	7,026	3,214	7,026	3,214	7,026	3,214
Number of firms	714	467	714	467	714	467	714	467
Test of equality (p-values) GF*second phase		0.549		0.040		0.021		0.617
GF*third phase		0.046		0.003		0.039		0.000
(i) and (ii)	0.000	0.000	0.001	0.049	0.019	0.736	0.004	0.022
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel D:								
	High profit	Low profit	High profit	Low profit	High profit	Low profit	High profit	Low profit
GF*second phase (i)	-8.378*** (-7.51)	-9.058*** (-5.99)	-0.541** (-2.11)	-10.240*** (-3.02)	-1.085* (-1.82)	-5.641*** (-5.46)	0.088* (1.70)	-0.070 (-0.54)
GF*third phase (ii)	2.247*** (4.89)	1.028 (1.60)	1.573*** (2.64)	-0.896 (-1.20)	0.304** (2.39)	-3.684 (-0.72)	-0.185*** (-4.92)	0.519*** (2.96)
Observations	7,336	3,011	7,336	3,011	7,336	3,011	7,336	3,011
Number of firms	732	437	732	437	732	437	732	437
Test of equality (p-values) GF*second phase		0.522		0.109		0.007		0.374
GF*third phase		0.015		0.001		0.000		0.005
(i) and (ii)	0.000	0.000	0.001	0.006	0.049	0.668	0.000	0.024
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using logit regressions with firm fixed effects. The dependent variable 'FCB' is a binary variable to capture the probability of issuance of foreign currency borrowings. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. Firms are classified into high (or low) coverage or profits if their coverage or profitability ratios are above (or below) the median of the entire distribution of all the firms in that particular year. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. The remaining specifications, which are not reported for brevity, are identical to those in tables 2-5. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 10: Robustness: Time-series analysis

Dependent variable:	Log (international claims of banks towards Indian non-bank private borrowers)			
	(1) GF= VIX	(2) GF= US corporate yields	(3) GF= MOVE	(4) GF= Int. rate differential
Panel A: GF	-0.818* (-1.98)	-1.962*** (-3.15)	-0.747* (-1.72)	0.120* (1.93)
JP VIX	-0.048** (-2.32)	-0.013 (-0.87)	-0.039** (2.08)	-0.006 (-0.40)
Observations	71	71	71	71
Panel B: GF*second phase (i)	-0.154 (-0.58)	-4.081*** (-3.36)	-1.667** (-2.16)	0.070 (1.46)
GF*third phase (ii)	0.681*** (4.00)	2.503*** (4.86)	0.608*** (4.37)	-0.194** (-2.20)
Observations	71	71	71	71
Test of equality (p-values): (i) and (ii)	0.058	0.001	0.066	0.000
Dependent variable:	Log (amount outstanding of debt instruments issued abroad by Indian nonfinancial corporations)			
	(1) GF= VIX	(2) GF= US corporate yields	(3) GF= MOVE	(4) GF= Int. rate differential
Panel C: GF	-0.727** (-2.16)	-1.691*** (-4.97)	-0.756* (-1.77)	0.105** (2.11)
JP VIX	-0.028 (-1.58)	-0.002 (-0.24)	-0.025* (-1.68)	-0.011 (-0.84)
Observations	71	71	71	71
Panel D: GF*second phase (i)	-0.091 (-0.42)	0.026 (0.16)	-1.036 (-1.52)	0.059 (1.33)
GF*third phase (ii)	0.501*** (3.28)	1.402*** (4.15)	0.454*** (3.52)	-0.221** (-2.56)
Observations	71	71	71	71
Test of equality (p-values): (i) and (ii)	0.025	0.000	0.013	0.002

Notes: All specifications are estimated using OLS regressions. The dependent variable are international claims of banks towards Indian non-bank private borrowers (log) and amount outstanding of debt instruments issued abroad by Indian nonfinancial corporations (log). GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. The remaining specifications, which are not reported for brevity, are identical to those in tables 2-3. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 11: Robustness: Alternative cut-off point

Dependent variable:	FCB							
	(1) GF= VIX	(2)	(3) GF= US corporate yields	(4)	(5) GF= MOVE	(6)	(7) GF= Int. rate differential	(8)
Panel A:	High coverage ratio	Low coverage ratio	High coverage ratio	Low coverage ratio	High coverage ratio	Low coverage ratio	High coverage ratio	Low coverage ratio
GF*second phase (i)	-0.023** (-2.22)	-0.141*** (-2.77)	-0.156** (-2.26)	-0.031*** (-3.82)	-0.019*** (-2.93)	-0.137* (-1.73)	-0.011 (-1.51)	0.004* (1.83)
GF*third phase (ii)	0.072** (2.22)	0.004 (0.18)	0.196*** (3.27)	0.018 (0.66)	0.313** (2.40)	-0.471 (-1.56)	-0.002* (-1.66)	0.003 (1.55)
Observations	1,069	2,756	1,069	2,756	1,069	2,756	1,069	2,756
Number of firms	440	885	440	885	440	885	440	885
Test of equality (p-values)								
GF*second phase		0.478		0.149		0.276		0.317
GF*third phase		0.046		0.003		0.009		0.012
(i) and (ii)	0.018	0.001	0.003	0.078	0.013	0.142	0.159	0.257
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B:	High profit	Low profit	High profit	Low profit	High profit	Low profit	High profit	Low profit
GF*second phase (i)	-0.013 (-1.28)	-0.132** (-2.15)	-0.256*** (-3.42)	-0.028*** (-3.49)	-0.021*** (-3.77)	-0.116* (-1.69)	-0.006 (-1.03)	0.008** (1.98)
GF*third phase (ii)	0.063** (2.15)	0.017 (1.10)	0.203*** (3.18)	0.022 (0.70)	0.326*** (2.79)	-0.375 (-1.35)	-0.001 (-1.38)	0.004 (0.59)
Observations	1,160	2,665	1,160	2,665	1,160	2,665	1,160	2,665
Number of firms	463	880	463	880	463	880	463	880
Test of equality (p-values)								
GF*second phase		0.134		0.001		0.317		0.503
GF*third phase		0.004		0.003		0.046		0.407
(i) and (ii)	0.034	0.026	0.001	0.128	0.004	0.223	0.376	0.599
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. Firms are classified into high (or low) coverage or profits if their coverage or profitability ratios are above (or below) the 75th percentile of the entire distribution of all the firms in that particular year. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. The remaining specifications, which are not reported for brevity, are identical to those in tables 4-5. Robust t-statistics are reported in the parentheses. Statistical significance is denoted at 1% (***), 5% (**) and 10% (*).

Table 12: Robustness: Alternative definitions of firm heterogeneity

Dependent variable:	FCB							
	GF= VIX		GF= US corporate yields		GF= MOVE		GF= Int. rate differential	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A:	High liquidity	Low liquidity	High liquidity	Low liquidity	High liquidity	Low liquidity	High liquidity	Low liquidity
GF*second phase (i)	-0.001 (-0.01)	-0.150** (-2.25)	-0.230*** (-4.12)	-0.022* (-1.86)	-0.063*** (-3.11)	-0.081** (-2.24)	-0.002 (-0.48)	0.012** (2.53)
GF*third phase (ii)	0.036* (1.93)	0.009 (0.51)	0.134*** (2.96)	0.035 (1.20)	0.234** (2.28)	-0.126 (-0.59)	-0.002** (-2.36)	-0.001 (-0.13)
Observations	1,971	1,854	1,971	1,854	1,971	1,854	1,971	1,854
Number of firms	692	692	692	692	692	692	692	692
Test of equality (p-values)								
GF*second phase		0.177		0.009		0.503		0.389
GF*third phase		0.080		0.072		0.003		0.089
(i) and (ii)	0.026	0.670	0.000	0.064	0.008	0.814	0.880	0.004
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B:	Larger firms	Smaller firms	Larger firms	Smaller firms	Larger firms	Smaller firms	Larger firms	Smaller firms
GF*second phase (i)	-0.078 (-1.56)	-0.682* (-1.82)	-0.146*** (-3.90)	-0.195** (-2.48)	-0.013*** (-4.26)	-0.425*** (-3.11)	-0.003 (-0.93)	0.003 (0.36)
GF*third phase (ii)	0.039*** (3.45)	-0.212 (-1.60)	0.105*** (3.67)	-0.395** (-2.61)	0.188*** (3.03)	-0.542 (-1.49)	-0.001** (-2.52)	0.004* (1.79)
Observations	3,657	168	3,657	168	3,657	168	3,657	168
Number of firms	1,014	88	1,014	88	1,014	88	1,014	88
Test of equality (p-values)								
GF*second phase		0.134		0.503		0.003		0.503
GF*third phase		0.055		0.004		0.042		0.003
(i) and (ii)	0.029	0.257	0.000	0.242	0.001	0.695	0.674	0.946
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C:	High sectoral tangibility	Low sectoral tangibility	High sectoral tangibility	Low sectoral tangibility	High sectoral tangibility	Low sectoral tangibility	High sectoral tangibility	Low sectoral tangibility
GF*second phase (i)	-0.226*** (-3.00)	-0.011** (-2.17)	-0.018** (-2.14)	-0.027*** (-3.42)	-0.009** (-1.99)	-0.073** (-2.23)	0.009*** (2.74)	0.008** (2.12)
GF*third phase (ii)	0.041** (2.02)	-0.005 (-0.57)	0.081*** (3.03)	0.022 (1.04)	0.214** (2.02)	-0.252* (-1.94)	-0.008*** (-3.12)	0.021** (2.56)
Observations	1,865	1,960	1,865	1,960	1,865	1,960	1,865	1,960
Number of firms	587	541	587	541	587	541	587	541
Test of equality (p-values)								
GF*second phase		0.006		0.478		0.060		0.617
GF*third phase		0.012		0.046		0.000		0.032
(i) and (ii)	0.001	0.622	0.000	0.014	0.035	0.100	0.002	0.128
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel D:	Safer credit rating	Risky rating firms	Safer credit rating	Risky rating firms	Safer credit rating	Risky rating firms	Safer credit rating	Risky rating firms
GF*second phase (i)	-0.048* (-1.95)	0.002 (0.30)	0.037 (0.95)	-0.001 (-0.05)	-0.055** (-2.47)	0.002 (0.26)	0.010** (2.25)	-0.007 (-0.78)
GF*third phase (ii)	0.037* (1.73)	0.004 (0.32)	0.097** (2.04)	0.014 (0.49)	0.033** (2.18)	0.003 (0.45)	-0.014** (-2.39)	0.013 (1.34)
Observations	430	310	430	310	430	310	391	280
Number of firms	171	141	171	141	171	141	166	136
Test of equality (p-values)								
GF*second phase		0.184		0.303		0.095		0.153
GF*third phase		0.046		0.025		0.018		0.046
(i) and (ii)	0.058	0.031	0.321	0.407	0.018	0.869	0.008	0.212
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. Firms are classified into high (or low) liquidity, size or asset tangibility if their liquidity, size or sectoral asset tangibility ratios are above (or below) the median of the entire distribution of all the firms in that particular year. We also use credit ratings assigned by a rating agency to each firm to classify firms into safer and risky credit rating groups. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. The remaining specifications, which are not reported for brevity, are identical to those in tables 4-5. Statistical significance is denoted at 1% (***) , 5% (**) and 10% (*).

Table 13: Robustness: Addressing endogeneity concerns using 2SLS

Dependent variable:	FCB							
	(1) GF= VIX		(2) GF= US corporate yields		(3) GF= MOVE		(4) GF= Int. rate differential	
Panel A:								
GF	-0.065*** (-4.25)		-0.068*** (-4.14)		-0.067*** (-2.81)		0.007*** (3.01)	
JP VIX	-0.003*** (-3.17)		-0.003** (-2.78)		-0.002** (-2.11)		-0.001 (-1.40)	
Observations	3,281		3,281		3,281		3,281	
Number of firms	747		747		747		747	
Under-identification test	0.000		0.000		0.000		0.000	
Hansen J statistics	0.309		0.123		0.338		0.497	
Panel B:								
GF*second phase (i)	-0.056*** (-3.57)		-0.006*** (-3.33)		-0.049*** (-3.87)		0.001 (0.62)	
GF*third phase (ii)	0.086*** (3.64)		0.286*** (2.89)		0.087* (1.88)		-0.008*** (-5.46)	
Observations	3,281		3,281		3,281		3,281	
Number of firms	747		747		747		747	
Test of equality (p-values) (i) and (ii)	0.000		0.009		0.003		0.000	
Under-identification test	0.001		0.038		0.021		0.013	
Hansen J statistics	0.057		0.955		0.113		0.117	
Panel C:	(1) High coverage ratio	(2) Low coverage ratio	(3) High coverage ratio	(4) Low coverage ratio	(5) High coverage ratio	(6) Low coverage ratio	(7) High coverage ratio	(8) Low coverage ratio
GF*second phase (i)	-0.068*** (-3.30)	-0.005** (-2.00)	-0.076*** (-3.62)	-0.028*** (-2.78)	-0.009*** (-3.12)	-0.005*** (-2.66)	0.001 (0.60)	0.012 (0.83)
GF*third phase (ii)	0.117*** (4.02)	0.060 (0.60)	0.125** (2.29)	-0.037 (-0.71)	0.408*** (3.58)	0.086 (0.43)	-0.010*** (-5.22)	0.003 (0.37)
Observations	1,904	1,153	1,904	1,153	1,904	1,153	1,904	1,153
Number of firms	485	346	485	346	485	346	485	346
Test of equality (p-values) GF*second phase		0.046		0.095		0.719		0.520
GF*third phase		0.003		0.072		0.022		0.000
(i) and (ii)	0.000	0.519	0.001	0.856	0.000	0.648	0.000	0.159
Under-identification test	0.084	0.001	0.042	0.001	0.008	0.001	0.054	0.000
Hansen J statistics	0.121	0.879	0.157	0.913	0.549	0.673	0.102	0.826
Panel D:	High profit	Low profit	High profit	Low profit	High profit	Low profit	High profit	Low profit
GF*second phase (i)	-0.045** (-2.06)	-0.006** (-2.23)	-0.054*** (-2.78)	-0.031*** (-3.26)	-0.009*** (-3.20)	-0.005*** (-3.03)	0.002 (0.84)	0.020 (1.41)
GF*third phase (ii)	0.100*** (3.63)	0.022 (0.22)	0.122** (2.26)	-0.014 (-0.26)	0.416*** (3.73)	0.091 (0.46)	-0.011*** (-6.08)	0.009 (1.03)
Observations	1,981	1,083	1,981	1,083	1,981	1,083	1,981	1,083
Number of firms	495	327	495	327	495	327	495	327
Test of equality (p-values) GF*second phase		0.134		0.153		0.184		0.168
GF*third phase		0.008		0.014		0.063		0.046
(i) and (ii)	0.000	0.781	0.006	0.759	0.000	0.629	0.000	0.076
Under-identification test	0.052	0.000	0.065	0.000	0.026	0.000	0.053	0.001
Hansen J statistics	0.060	0.598	0.169	0.377	0.508	0.348	0.101	0.440
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All specifications are estimated using two-staged least squares (2SLS) with firm fixed effects. The dependent variable 'FCB' is the natural logarithm of the ratio of proceeds from foreign currency borrowings over total assets, in logs to minimize the impact of outliers. GF refers to the global factors such as the VIX (log), the US BBB-rated corporate yields (log), the MOVE index (log), and the interest rate differential between India and the US. Firms are classified into high (or low) coverage or profits if their coverage or profitability ratios are above (or below) the median of the entire distribution of all the firms in that particular year. All variables are lagged by one time period. The second phase indicates the period 2010-2013, and the third phase captures the period 2014-2017. Robust t-statistics are reported in the parentheses. The remaining specifications, which are not reported for brevity, are identical to those in tables 2-5. Statistical significance is denoted at 1% (***) , 5% (**) and 10% (*).