The second wave of global liquidity: why are firms acting like financial intermediaries?

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Abstract

Recent work has pointed to non-financial firms acting like financial intermediaries particularly in emerging economies. Corporates have been issuing large amounts in foreign currency and at the same time increasing liquid assets. In this paper we corroborate these findings but then ask the question, why this is happening? Our results suggest there is evidence for carry-trade activities but focused in countries with higher levels of capital controls, particular controls on inflows. We find little evidence for such activities given other market imperfections. We posit this phenomenon is due more to the reaction of countries in the face of low global interest rates, QE and strong capital inflows than the retreat of international banks due to impaired balance-sheets or tighter regulations.

Keywords: Corporate finance, bond issuance, currency mismatch, carry-trade, capital controls
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* The views expressed are strictly only those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors or the countries they represent.

1 Introduction

The second wave of global liquidity has been associated with a general fall in international bank lending and a rise of bond issuance, particularly from non-financial corporations and especially from emerging economies. Shin (2013) outlines the general pattern of this new phase in the cycle of global liquidity and Turner (2013) documents the change in the composition of net external financing of emerging economies. Figure 1 plots the rise in bond issuance from the sample of firms from emerging economies employed in this paper. As can be seen this was on a rising trend before the global financial crisis hit and then subsequently boomed from 2009 to 2013.

Figure 1 on Bond Issuance Here

What did firms do with the proceeds of these bond issues? There has been increasing concern that non-financial firms have been acting as financial intermediaries. In other words bond issuance has not been used solely for real investment but at the same time firms have been issuing they have also been increasing their cash or other liquid assets. There may be several motives for such behaviour but the one we focus on here is the underlying idea that non-financial firms may have replaced banks as the conduit through which international financial conditions affect domestic liquidity and credit growth in emerging economies. Powell (2014) for example documents how during this recent phase of low global interest rates and quantitative easing, firms in Latin America issued increasingly in US dollars and at the same time corporate deposits in LAC financial systems grew and in part fuelled a boom in domestic credit.

The question then arises why have non-financial firms taken on this role? One benign view is that, particularly in emerging economies, financial markets are not well developed and non-financial firms have been able to help correct such market failures by issuing perhaps on the strength of real collateral or strong relationships. A second view is that global banks have been retreating due to the combination of impaired balance sheets and tighter bank regulation and so non-financial firms have simply stepped into the gap. A third perhaps less benign perspective is that non-financial firms are able to arbitrage capital controls or other regulations that have prevented banks from pursuing what appear to be profitable opportunities. In countries with no or few capital controls, banks may then remain the main conduit for transmitting global financial conditions to domestic markets but in those countries that have adopted capital controls this role is at least to some degree being played by corporates.

Related to this final view, low global interest rates and QE in advanced economies fueled the fear in emerging economies that strong capital inflows, including carry trade type activities, would led to credit booms, currency appreciation and a type of Dutch Disease phenomenon. Some emerging economies responded with increased levels of capital controls particularly on inflows. Given such measures and heightened monitoring of financial transactions, financial institutions may not be allowed to pursue carry-trade type activities or may be taxed such that they are not profitable. Non-financial firms may have ways of escaping such controls. For example, there has been a rise in issuance of non-financial firms that are nationals of emerging countries in offshore financial centers. Such firms may then bring the proceeds of that issuance into the home country via an inter-company loan which in the balance of payments is normally counted as FDI and may escape capital controls or taxes levied on portfolio flows.

Which view is correct may have significant implications for policy. If the benign view is correct and non-financial firms are simply correcting market failures then policy should be directed to also ameliorating those failures such that financial institutions can play a more significant role in pooling and allocating savings. If non-financial firms are taking the place of retreating global banks then a close monitoring of that behaviour may be warranted in order to ensure that no systemic risks are being created or if they are that appropriate action is taken to ensure there are adequate buffers in place. If the final view is correct then this may also call into question the efficacy of capital controls

as a response to loose global financial conditions or at least calls for further work to understand how effective these controls are given these possibilities of arbitrage.

In this paper we then conduct a set of empirical tests aimed at attempting to understand which perspective is supported by empirical evidence, or more correctly which view we may not be able to reject. Our starting point is the body of work already conducted understanding which corporates issue and when and whether they use those funds for real investment or whether they hold some of the proceeds as financial assets. With a different dataset constructed in a quite different fashion, we replicate the results already found in the literature. Our contribution however is then to consider, using the variation across time and across countries, whether there is evidence in favour of carry trade activities and whether those activities appear to stem from each of the perspectives mentioned. We find surprisingly robust results in favour of just one of these hypotheses, namely in favour of an important role played by capital controls.

The paper is organized as follows. In the next section we provide a brief survey of relevant literature. In section 3, we describe the data we employ for the empirical analysis. In section 4 we reproduce certain results already considered in the literature on bond issuance and firms' cash balances. Section 5 then provides the main new empirical results; we investigate firms' carry trade activities and we select variables that correspond to each of the views described. In so doing we analyse evidence in favour or against each of the views considered. Section 6 concludes.

2 Literature

This paper spans several literatures regarding financial depth and corporate financial structure, the role of international banks and the credit cycle and systemic macroeconomic financial risks. A useful starting point is the wide literature on the relationship between financial depth, corporate financial structure and growth. Levine (2004) provides a comprehensive review. As corporates in emerging economies are operating almost by definition in an environment of incomplete financial markets, their actions may well be different to those of corporates in advanced economies where there may be fewer problems related to credit access and availability. For example, large corporates may have much better access to capital markets than smaller firms that they have relationships with, such as suppliers, and hence might borrow more to be able to pass the proceeds on in the form of direct loans to these firms exploiting the business relationships. In this manner larger firms may attempt to complete financial markets in environments where financial depth is limited - see for example Petersen and Rajan (1997), Demirgüç-Kunt and Maksimovic (2001), and Fisman and Love (2003). This line of argument suggests that there might then be a link between the financial structure of large corporates in emerging economies and financial depth. The lower is financial depth we may expect to see larger corporates borrowing more to be able to correct such market failures in financial markets.

A second literature focusses on the activities of international banks. In a set of early papers, authors such Goldberg (2002) and Martinez-Peria, Powell and Vladkova (2005) showed that a wave of foreign bank entry in emerging economies made them extremely important players gaining considerable market share through both cross border lending and through brick and mortar entry, through start-ups or more frequently by buying domestic banks with existing branch networks. A result highlighted in both of these papers was the higher volatility of direct cross-border lending relative to the more stable lending funded by deposits in local subsidiaries or branches. Still, it was found that shocks in home countries could affect banks in emerging host countries. Galindo, Micco and Powell (2005) developed a simple theoretical model to show that foreign banks may provide for more stable financing in the face of liquidity shocks, as it was assumed they had easy access to a pool of global liquidity, but may exacerbate the effects of other types of shocks – in the extreme an international bank may choose to withdraw from a particular country as a shock may make that investment inefficient in a portfolio selection type model. The more diversified the bank the more substitutable are such assets within a

portfolio and hence the smaller the shock that may cause such a withdrawal. More recently, the global financial crisis provided a rich set of data and potential experiments to analyse when foreign banks might retreat as a function of the characteristics of host countries and the shocks received in home countries. Much of this literature again considers the differences between foreign banks and domestic banks which is less our concern here – see for example Claessens and van Horen (2012) and De Haas and van Horen (2011). However, perhaps of more relevance here, Karam, Merrouche, Souissi and Turk (2014) consider changes in ratings and their impacts on potential bank funding[1]. Garcia-Luna and Van Rixtel (2014) provide a more recent, descriptive analysis of the retreat of global banking in general and discuss motivations including impaired balance sheets particularly of European banks and regulatory developments.

A third strand of literature is that highlighting the rise in corporate issuance, especially from emerging economies and especially in foreign currency and its implications. Shin (2013) has labelled this development as the second phase of global liquidity. Turner (2014) highlights the shift from bank financing to bond financing particularly for emerging economies. Chung et al (2014) document the importance of this trend in terms of overall global liquidity and discuss the potential ramifications for financial stability. Shin and Zhao (2013) consider the specific cases of India and China where larger non- financial firms are found to behave more like financial intermediaries in contrast to the US. Powell (2014) considers the case of four large Latin American economies (Brazil, Chile, Colombia and Mexico) and documents a strong increase in issuance from non-financial firms, particularly in US dollars, and at the same time an increase in corporate deposits that appears to have played a significant role in financing the increase in domestic credit which is largely denominated in local currency. Two specific concerns are noted reflecting the more general discussion in Shin (2013) and Chung et al (2014). First that unless such transactions are hedged currency mismatches may be created and secondly that such carry trades may be easily made and just as easily reversed. Given for example a sharp rise in US interest rates, corporates may decide to liquidate domestic financial assets to seek other investment opportunities creating potential systemic liquidity risks. The first risk reflects the view that under-developed financial markets may underinsure systemic risks - see Caballero and Krishnamurthy (2003). Subsequent papers such as Rodrigues-Bastos, Kamil, and Sutton, (2015) have also noted the strong increase in issuance of LAC firms and noted the potential risks involved. Powell (2015) notes the continuation of the trend of strong bond issuance of non-financial firms in Latin America and also documents a deterioration of firms' balance sheets. In particular the combination of a rising dollar amortization schedule and falling earnings ratios is noted. The implication is that in the coming months and years ahead, the financial assets that have been built up, much of which may have been invested in local financial systems, may well be required to pay outstanding external obligations.

Related to the discussion above regarding capital controls, Shin (2013) also notes the increase in issuance of non-financial firms through subsidiaries in offshore financial centers. Indeed the cases of Brazil and China are highlighted where there is a considerable and growing difference between external issuance of firms on a residence basis and issuance on a nationality basis as the latter includes issuance by the subsidiaries of Brazilian or Chinese firms in offshore centers. One potential reason for this trend is to evade capital controls or taxes on certain inflows. Powell (2014) considers this issue in the case of Latin America and shows that while in the case of Brazil issuance on a nationality basis exceeds issuance on a residency basis the opposite is true for Chile. In other words in recent years more foreign nationality firms are issuing through subsidiaries in Chile than Chilean national firms are issuing through subsidiaries. As Chile does not have capital controls while Brazil does this may provide some specific evidence for the potential importance of such controls in explaining this type of behaviour.

The recent paper by Bruno and Shin (2014) is perhaps the closest paper to ours. This paper also considers the rise in issuance of non-financial corporates. The authors analyse the determinants of

[1] In fact these authors consider the changes in bank ratings but bank ratings are frequently correlated with the change in the rating of the sovereign where they operate.

issuance and note evidence in favor of carry trade activities by comparing different periods (when carry trades were less and then more attractive) and they also discuss the potential issues for financial stability. Our methodology in identifying carry trade activities is somewhat different but still we corroborate their findings in this regard. More importantly our contribution is to consider alternative hypotheses as to why non- financial firms are making such financial transactions, specifically related to the three views we have outlined above.

3 Data

We collected annual data for the period 2000-2014 on firms' balances sheets and bond issuances from two different sources. We obtained annual data on firms' cash balances and other balance sheet variables from the Thomson-Reuters Worldscope database and sourced data on bond issuances from Dealogic's DCM database. We focused on a sample composed of the fifty largest listed non-financial, non-foreign firms in each of eighteen emerging markets. Table A1 in Appendix 1 lists the eighteen markets and gives details of the sample in each. The baseline analysis includes a total of 766 firms. As shown in the table, the sample of the largest fifty listed firms accounts for over 90% of the market capitalization in most markets.[2] Note that we are not interested here in a representative sample of firms, rather we are interested in larger firms that are active in capital markets and that have good access to finance and hence may contemplate a variety of different types of market transactions. Our interest is precisely in understanding the behaviour of these larger firms. We also feel that the larger, listed firms are likely to have better quality data, that their accounts are prepared in a professional manner and audited and studied by outside analysts.

Given the many specific issues related to firms' names and the coding of each dataset, the data from Worldscope and Dealogic was then merged manually, making sure that for each listed firm in our sample we were able to either find a match in the issuance data or we could confidently assign zero issuance (because the firm didn't have any issuance reported in Dealogic). This process was done based on the names and nationality of the firms reported in the two databases. When we were unable to assign a clear match based on the names as spelled, we double-checked different spellings/abbreviations based on web searches.

The dataset of bond issuance was constructed at the parent level. This is key as then our measure of bond issuance for each firm includes bond issuance made under the name of the firm itself and all issuances made through all subsidiaries in any part of the world. In our analysis we are then agnostic as to whether issuance is through a subsidiary, perhaps in an offshore financial centre, or the bond is issued directly by the parent. We used the parent's nationality of operations reported in Dealogic to assign a particular firm to a particular country. We constructed measures of bond issuance based on the currency of denomination of the bond[3] and further decomposed foreign currency issuance between hard currencies and other currencies, with the hard currency category being the sum of issuance in

[2] We downloaded data for all firms listed in the eighteen emerging markets of interest. The universe of firms was identified using Worldscope's constituent lists for all country exchanges in a given country (e.g., firms listed in Sao Paulo or Rio de Janeiro were assigned Brazil as nationality). We then used Thomson Reuters' business classification to exclude firms classified as Financials. The largest firms were identified based on market capitalization as of end of 2014. We used data from Worldscope on foreign ownership of shares to identify firms with foreign majority ownership. Firms with no foreign ownership reported or with less than 50% of foreign ownership were classified as domestic. After excluding non-financial firms and foreign firms we are left with 803 firms in the eighteen countries of interest; although only 766 firms have data on sales, leverage and other required variables. In some countries, there are less than fifty non-financial, non-foreign firms; yet, in all cases, with the exception of South Korea, the coverage by market capitalization is above 80%.

[3] Dealogic's DCM database is a database of bond issuances at the tranche level. We computed a measure of annual issuance in local and foreign currency by parent after downloading all issuances reported in the world for the period 2000-2014. We then collapsed the data using the parent listed in Dealogic. We assign currencies to nationalities based on the currency in use as of end-of-2014. We include in the measure of local currency issuance of bonds indexed and non-indexed to inflation.

USD, EUR, GBP, JPY, and CHF. Issuance in hard currencies is the key variable used in most of the regression analyses.

We obtained data on capital controls from Chin and Ito (2006), using the updated release to have data to 2014, and from Fernández et al. (2015) which has information to 2013. These indices are based on a binary classification of the capital control measures reported in the IMF's Annual Report on Exchange Rate Arrangements and Restrictions (AREAER). The index by Chin and Ito is a continuous measure of overall capital account openness, ranging from -1.86 to 2.39 and increasing in the level of capital account liberalization.[4] The index by Fernández et al. is a discrete index of restrictions to capital flows, with separate measures for each category of inflows and outflows. Their overall measure of capital account restrictions is the simple average of the binary codings for all possible controls/restrictions in ten asset categories. We transformed both indices so that they range between 0 and 1 and are increasing in the level of capital account openness.

From Worldscope we obtained firm-level data on sales, total debt, and total assets. Based on these data we computed ratios of debt to sales and leverage (debt to assets). We complemented the firm-level data with country-level data on deposit interest rates, sourced from the World Bank's WDI database, and data on yields of BAA rated bonds in the USA. Based on the last two measures, we computed the spread between the local currency deposit rate in each country and the prevailing cost of borrowing in the US.

We also obtained measures of financial development and creditor rights from the World Bank. In addition, we obtained the credit ratings of long-term sovereign debt denominated in foreign currency. The ratings are those of S&P and Moody's and were sourced from Thomson Reuters. We followed the common practice of assigning scores from 1 to 21 to the rating categories (21 being the highest quality rating of AAA) and rescaled the resulting index to range between 0 and 1. See Afonso (2007), Powell and Martinez (2008) and Cavallo et al (2013) for a discussion of using a numerical, cardinal scale for ratings versus other techniques, and in the end all three papers employ a numerical, cardinal scale. The first two papers present models for ratings. Powell and Martinez (2008) in particular argue that ratings are actually fairly easy to model (possibly too easy given problems of endogeneity and identification) as rating agencies give considerable information as to what factors drive their ratings and hence suggest that ratings may be considered a convenient, if someone particular, summary of those macroeconomic fundamentals and judgements regarding political and other less quantifiable risks. Cavallo et al (2013) within an errors in measurement type methodology (as both ratings and market prices are considered noisy signals of actual fundamentals) show that sovereign ratings do add value in the sense that market variables are found to respond on average to changes in ratings. These results indicate that ratings may indeed be considered on average as at least a useful summary of fundamentals that drive more market measures of country risk.

4 Bond issuances and Cash Holdings

We start by testing whether non-financial corporations based in emerging markets keep the proceedings of foreign currency bond issuances in cash. We use a specification similar to that in Bruno and Shin (2015). Specifically, we estimate the following model:

$$ln\left(\frac{C}{SA}\right)_{i,c,t} = FXB_{i,c,t}\left(\beta + \delta\widetilde{SP}_{c,t}\right) + X_{i,c,t}\Gamma + \alpha_i + \theta_{c,t} + \varepsilon_{i,c,t} \quad (1)$$

The dependent variables is the log cash holdings (plus short term investment) scaled by sales of firm *i*, in country *c*, in year *t*. The explanatory variables are firm-level foreign currency bond issuances (*FXB*), the spread between the local currency deposit rate in country *c* and borrowing costs in the US

[4] Chinn-Ito compute their overall index on capital account openness as the first principal component of the AREAER summary binary codings of controls relating to current account transactions, capital account transactions, the existence of multiple exchange rates, and the requirements of surrendering export proceeds.

for BAA rated corporations (we are actually using the demeaned spread ($\widetilde{SP}_{c,t} = SP_{c,t} - \overline{SP}$)), a set of time-variant firm-specific controls (the matrix $X_{i,c,t}$ includes the log of debt over sales, log sales, and leverage, a set of firm fixed effects (α_i), and a set of country-year fixed effects ($\theta_{c,t}$, among other things the country-year fixed effects fully absorb the main effect of $\widetilde{SP}$).

In the set-up of Equation (1), β captures the marginal effect of bond issuances on cash holding when $SP_{c,t} = \overline{SP}$ (if we had used and $SP_{c,t}$ instead of $\widetilde{SP}_{c,t}$, β would have captured the marginal effect of bond issuances on cash holding when $SP_{c,t} = 0$), and δ captures how spreads affect the marginal effect of bond issuances on cash holdings.[5]

We use three different measures of foreign currency bond issuances: the log of one plus foreign currency bond issuances; the log one plus the ratio of foreign currency issuances to sales; and a dummy variable that takes a value of one if firm *i* issued a foreign currency bond in year *t*.[6]

When we estimate equation (1) without the interactive term (i.e., when we set $\delta = 0$), we find that foreign bond issuances are always positively correlated with cash holdings (Table 2, columns 1, 3, and 5). Therefore, our results corroborate Bruno and Shin's (2015) finding that in emerging markets non-financial corporations keep a substantial fraction of foreign currency bond proceeds as cash.

When we allow for the correlation between bond issuances and cash holdings to vary with the spread between borrowing costs in the US (proxied by the yield of BAA rated bonds) and the local deposit rate, we find that δ is always positive (which is *prima facie* evidence for carry trade activities), but never statistically significant (columns 2, 5, and 8 of Table 2).

Finally, we interact foreign bond issuances with a dummy variable that takes a value of one when our spread indicator is below the sample median (LS) and with a dummy variable that takes value of one when the spread is above the sample median (HS). Columns 3, 6, and 9 of Table 2 show that the coefficient of FXB*HS is always positive and statistically significant and that the coefficient of FXB*LS is never statistically significant.[7] This finding is consistent with Bruno and Shin's results that, in emerging market countries, bond issuances are significantly correlated with cash holdings when a carry trade indicator is above the median and are not significantly correlated with cash holdings when the carry trade indicator is below the median.

So far, we established that emerging market based firms that issue in foreign currency tend to hold more cash and that the relationship between bond issuances and cash holding is increasing in the spread between local deposit rates and the cost of borrowing in the US. In the next section we will explore heterogeneity in this relationship. Before doing so, we check if there is something special about foreign currency bonds or whether non-financial corporations always keep a fraction of bond issuances in cash, no matter whether they are issuing in domestic or foreign currency.

The first two columns of Table 3 estimate the models of the first two columns of Table 2, but substitute foreign currency bond issuances with domestic currency bond issuances. We find that domestic bond issuances are never significantly correlated with cash holdings. In the last three columns of the table we jointly control for domestic and foreign bond issuances (we use the same definitions of foreign bond issuances of Table 2), we find that foreign bond issuances are always

[5] Alternatively, δ measures how bond issuances affect the marginal effect of spreads on cash holding. Formally, $\delta = \partial\left(\frac{\partial ln\left(\frac{C}{SA}\right)}{\partial FXB}\right)/\partial SP = \partial\left(\frac{\partial ln\left(\frac{C}{SA}\right)}{\partial SP}\right)/\partial FXB$. Note that the marginal effect of spreads on cash holding is absorbed by the country-year fixed effects.

[6] When we take logs, we add one to total bond issuances because approximately 95 percent of our observations have a value of zero for bond issuances.

[7] However, the two coefficients are not significantly different from each other. A fact consistent with our results that δ is not statistically significant.

significantly correlated with cash holdings and that domestic issuances are never significantly correlated with cash holdings.

5 Carry trade and capital controls

As discussed in the introduction above, several countries have responded to high capital inflows, stimulated by low global interest rates and quantitative easing in advanced economies through the imposition of capital controls. Figure 2 illustrates the fall in capital account openness especially in the period following the global financial crisis. When capital account transactions are heavily regulated, it may be much more difficult or expensive for banks to pursue carry trade activities. However, it may be much more difficult to regulate the transactions of non-financial corporations that may use current account transactions or may use inter-company loans to transfer resources that are normally considered as FDI. In such a setting, non-financial firms may become the channel through which capital inflows take place. If this is the case, we should find that the presence of capital controls should amplify the correlation between foreign bond issuances and cash holdings when there are large differences between domestic and foreign interest rates.

We test if the incentives of non-financial corporation to act as surrogate financial intermediaries are stronger in the presence of capital controls by estimating the following model:

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

where K is a continuous measure of capital account openness that ranges between 0 (closed capital account) and 1 (open capital account) and the remaining variables are the same as in Equation (1). Our parameter of interest is ϕ. A positive value of ϕ would suggest that non-financial corporations are more likely to exploit interest rate differentials when the capital account is open (perhaps because they can do so in the open), a negative value of ϕ, instead, would be consistent with Shin and Zaho (2013) and Chung et al.'s (2015) hypothesis that firms use within company loans to elude capital controls (the returns of eluding capital controls are higher because banks which in general face lower transaction costs cannot arbitrage interest rate differentials).

Before estimating the model with the triple interaction, we check whether interacting foreign bond issuances with capital account openness alters the results of Table 2. In columns 1, 3, and 5 of Table 4 we set ϕ=0 and show that once we control for capital account openness, the main effect of FXB is no longer significant and the interactive effects are rarely statistically significant (FXB*KO is statistically significant in column 3).

When we allow for the triple interaction, however, our results change dramatically (columns 2, 4, and 6 of Table 4). The parameter δ is always positive and statistically significant, indicating that in countries with a close capital account (i.e., when K=0), the likelihood that the proceeding of foreign currency bond issuances are kept in cash is increasing in the spread between the local deposit rate and foreign currency borrowing costs (a behaviour consistent with the presence of carry trade activities). However, ϕ is always negative, statistically significant and with point estimates close to $-\delta$ (in fact, we cannot reject the hypothesis that $\delta + \phi = 0$, we report the test at the bottom of Table 4). This finding is consistent with the hypothesis that non-financial corporations do not engage in carry trade activities when they operate in countries with an open capital account (K=1).[8]

Panel A of Figure 3 plots how the sensitivity of the relationship between foreign bond issuances and cash holding to our spread variable varies with capital account openness (the figure uses the model of column 2, Table 4). The figures shows that $\frac{\partial\left(\frac{\partial Cash}{\partial FXB}\right)}{\partial SP}$ is positive and statistically significant when

[8] In Table 4, we follow Shin and Zhao (2013) and scale our variables by sales. Our results are robust to following Bruno and Shin (2015) and scaling our variables by assets (see columns 1-3 of Table A1 in the Appendix)

K<0.45 (the median value in our sample if 0.44), the derivative is positive but not statistically significant when 0.45<K<0.65, and becomes negative (but never statistically significant) when K>0.65.

In Table 4, we measured capital account openness using the updated version of the Chinn and Ito (2006) aggregate index. This index does not allow separating controls on inflows from controls on outflows. It is, however, plausible that controls on inflows are more relevant for non-financial firms that are trying to elude capital controls exploit carry trade opportunities. To test this hypothesis, we use the Fernández et al. (2015) index of capital control which allows separating controls on outflows from controls on inflows.

Table 5 reports the results using the log of 1 plus foreign currency bond issuances (the results are robust to using the other measures of FXB). In the first column of Table 5, we estimate the same model of column 2 Table 4 by replacing the Chinn and Ito index with the overall measure (inflows and outflows) of capital account openness of Fernández et al. (2015).[9] The results are almost identical to those of Table 4 (Panel B of Figure 3, plots the results). Next, we use the Fernández et al. (2015) measures of openness to inflows (*KI*, Column 2) and outflows (*KO*, column 3) and find results which are similar to those obtained for the overall index.[10]

The fact that openness to inflows and openness to outflows yield similar results is not surprising because the two components of the index are highly correlated (the correlation coefficient is 85% and a regression of one KI over KO yields a coefficient of 0.7, with a t-statistics of 70 and an R-squared of 0.7). However, if we include both components in a horserace regression we find that the results are driven by openness to inflows (column 4). This result is consistent with the hypothesis that non-financial corporation use within company loan to go around controls. The two bottom panels of Figure 3 plots the results of the regression that includes both types of capital account openness. Panel C plots the coefficient for openness to inflows. We find the usual negative relationship of Panels A and B, but the curve is steeper, and the point at which the coefficient becomes insignificant is higher than in the regressions that use total openness. Panel D, instead, shows that openness to inflows is positively correlated with our measure of carry trade activity, but the coefficient is never statistically significant.

To probe further, we regress the inflow and outflows measures on the overall index of capital controls and use the errors of this regression as measures of controls on inflows and outflows that are orthogonal to overall capital controls (again, we rescale these two measures to range between 0 and 1, with 1 indicating maximum openness). In column 5 of Table 5, we control for both overall capital account openness and for openness to inflows that is orthogonal to overall openness (KI_R), we find that what matters is openness to inflows. In column 6, we repeat the experiment but now we include openness to outflows (KO_R). We find that the effect goes in the opposite direction, indicating that openness to outflows actually amplifies carry trade activities (this finding is consistent with what we showed in panel D of Figure 3). This suggests that firms are unlikely to engage into carry trade activities if there have doubts on their ability to repatriate profits. It may also mean that controls on outflows are more tightly enforced than controls on inflows.

5.1 Underdeveloped capital markets and sovereign risk

However, as discussed the presence of capital controls is just one of several potential explanations for non-financial firms to act as financial intermediaries. They may also be playing this role as emerging countries have underdeveloped capital markets or because international banks have retreated. We posit that financial depth and creditor rights are reasonably proxies for the lack of complete financial

[9] Note that the original Fernández et al. (2015) index gives higher values for countries with a closed capital account. We rescaled the index such that 1 means open capital account and 0 closed capital account.
[10] When we control for overall capital account openness and for openness to outflows, we find that the coefficient of FXB*K is negative and statistically significant, but that this is not the case when we use controls on inflows.

markets and that banks suffering from either impaired balance sheets or increased regulation are likely to retreat more from countries with lower credit ratings on long term foreign currency bonds. Hence we test for these alternative views by estimating equation (2) replacing capital account openness with a measure of creditor rights, a measure of financial depth, and two numerical measures of sovereign risk.

In column 1 of Table 6, we use the index of creditors' rights compiled by the Doing Business report. As before, we rescale the variable to range between 0 and 1 (1 meaning stronger creditor rights).[11] We find that creditor rights do not affect the correlation between foreign bond issuance and cash holdings of non-financial corporations (Column 1). Next, we use a standard measure of financial depth (credit to the private sector) as a proxy of financial development.[12] Also in this case, we find that financial depth does not affect the correlation between foreign bond issuances and cash holdings (Column 2). Finally, in columns 3 and 4 we run two horserace regressions that include financial development (creditors' rights in column 3 and financial depth in column 4) and capital account openness (we use controls on inflows, but the results are robust to using overall capital account openness). We find that the effect of capital account openness is robust to controlling for financial development.

In Table 7 we look at the role of sovereign risk using both Standard and Poor's and Moody's credit ratings. We follow Afonso (2007) and assign scores from 1 to 21 to the various rating categories (21 means AAA) and then rescale the resulting index to range between 0 and 1. Column 1 of Table 7 uses S&P ratings and shows that credit ratings are not statistically significant on our model. Column 2 includes both credit ratings and capital controls and shows that our baseline results are robust to controlling for credit ratings interactions. Columns 3 and 4 repeat the experiment with Moody's rating and find identical results.

5.2 Other robustness checks

We further check if our results are robust to a series of alternatives specifications and subsamples. First, we split our sample into three different regions: Latin America (6 countries, 261 firms and 2940 observations), Asia (5 countries, 237 firms and 2512 observations), and Europe (5 countries, 158 firms and 1404 observations).[13]

Table 8 shows that our results are robust in all sub-regions, but that they are weaker in Europe. This might be due to the fact that in our regressions we use US$ borrowing rates, but for European emerging markets the relevant currency is likely to be the euro.[14] Moreover, three of the countries included in the European subsample (Czech Republic, Hungary, and Poland) are part of the European Union and, according to certain criteria, should not even be classified as emerging markets.

To check whether our results are driven by influential observations, we estimate our benchmark regression by dropping one country at a time. Table A3 reports the results for the FXB*SP*KI coefficient. It shows that the coefficient is always negative (ranging between -0.01 and -0.03) and statistically significant. We also run a set of placebo regressions (we run 500 regressions that randomly allocate capital controls across country-periods) and find that the average placebo coefficient is centred at zero and that only 5 percent of the placebo regressions (4.7 percent to be precise) are statistically significant at the 5 percent confidence level. This is exactly what one would expect to find if the coefficient is not statistically significant.

[11] As Doing Business data for creditors' rights start in 2005, we use 2005 values for the 2000-2004 period. The results are robust to dropping the 2000-2004 period.
[12] As cash deposits of corporations that borrow abroad may have an impact on the provision of domestic credit, we set FD to be equal to credit to the private sector in the year 2000.
[13] We exclude South Africa and Israel which do not belong to any of the geographical regions of table 7.
[14] In Table 8, we use openness to inflows, but the results are robust to using overall openness.

Next, we split the sample in two sub-periods: 2007-2014 and 2000-2006 and find that the results hold for 2007-2014 (Table A4). This finding is consistent with the view that carry trade activities by non-financial corporations are linked to the Second Phase of Global Liquidity (Shin, 2013).

One possible issue with the carry trade interpretation of our results is that, rather than engaging in carry trade activities, non-financial corporations hold the proceedings of bond issuances in cash because it takes some time between the moment in which they borrow and the moment in which they need the funds to finance an investment project (of course, it is not obvious why this lag should be depend on the spread or why this result should only hold for foreign bond issuances). To check if our results are driven by this possibility, we look at cash holdings one year after bond issuances.

We start by showing that our results are robust to regressing cash holdings at time t on all controls at time t-1. The first two columns of Table A4 estimate the model of columns 1-2 of Table 5 but with lagged explanatory variables and find results which are essentially identical to those of Table 5. The last two columns of Table A4 measure all explanatory variables at time t with the exception of bond issuances which are measure at time t-1. Again, the results are robust to this specification.

5.3 Endogeneity

It is possible that countries introduce capital controls exactly to limit the type of carry trade activities that we describe in this paper. If this were the case, our estimates would be upward biased. While the use of country-year fixed effects should allay most concerns of reverse causality, we also use two strategies to assess whether our results are robust to controlling for the endogeneity of capital controls.

First, we focus on Second Phase of Global Liquidity and estimate our model for the period 2009-14 by using the level of capital controls in 2008. If changes in capital controls were a reaction to the massive inflows that followed the global financial crisis, using their 2008 value should address any endogeneity concern. The first two columns of Table 9 show that our results are robust to this specification.

Second, we use the results of Table 5 which show that, while controls on inflows are highly correlated with control on outflows, controls on outflows do not matter when our regressions include controls on inflows. Therefore, we instrument controls on inflows with control on outflows (specifically we instrument FXB*KI and FXB*KI*SP with FXB*KO and FXB*KO*SP). Column 3 of Table 8 shows that in the IV regression the triple interaction coefficient has the right sign but it is no longer statistically significant (the p value is 0.12).This may be due to the loss of efficiency of the IV estimator (the coefficient is still negative and close to what we obtained with the OLS estimations of Table 5: -0.012 versus -0.009). In fact, if we limit our sample to Asia and Latin America (the regions for which our results are stronger, see Table 8), the results are also statistically significant in the IV regression (Column 4 Table 9).[15]

6. Conclusions

This paper adds to the growing literature considering the increase in issuance of non-financial firms, particularly in dollars and especially from emerging economies. There are several potential implications of this phenomenon which is seen as central to the characteristics of the second phase of global liquidity. However, in order to draw the right conclusions it is important to understand the motives as to why firms are behaving as they are.

[15] In the IV regressions we use end the sample in 2013 because the capital controls data for 2014 are imputed to be equal to the 2013 values.

We first corroborate two results already found in the literature; namely that firms are issuing and are not using the proceeds solely for real investment but also to maintain cash or liquid asset balances and secondly that they appear to be doing so when the conditions for pursuing carry trade activities are more attractive. This suggests, as others before us, have also indicated that firms that are issuing are behaving like financial intermediaries. This by itself raises potential concerns for financial stability specifically in relation to currency mismatch risks and liquidity risks for the local financial systems.

However, non-financial firms may be behaving like financial intermediaries for various motives. A benign view would be that they are attempting to correct market failures and hence serving a role in trying to complete incomplete financial markets. However, when we attempt to test such a view considering how such behaviour varies with financial depth, or by creditor rights, we do not find any statistically significant results. Secondly, non-financial firms may be taking the place of global banks that have been retreating due to impaired balance sheets or increased regulatory pressure. If this were the case then we would expect some relation to risk and hence we attempt to find a pattern using sovereign credit ratings, commonly used by banks and by bank regulators to proxy risk, but again find no statistically significant results.

A third view is that as a response to low global interest rates and quantitative easing in advanced economies, several emerging economies have imposed or tightened capital controls and that non - financial firms have mechanisms that are not available to banks to evade such controls. We argued that it would be controls on inflows that would be particularly relevant in this case. We find strong statistical evidence, in favour of the view that non-financial firms are acting like financial intermediaries, in countries with relatively high capital controls - and particularly where there are controls on capital inflows. Moreover these results appear to be robust to a battery of tests.

We leave an in-depth discussion of the policy implications of these results for future work. Suffice to summarize here however that while our results do not back the view that non-financial firms are attempting to complete incomplete markets nor take on a role left by global banks retreating, at least related to sovereign risk, they do suggest that firms are attempting to gain from carry trade type activities where capital controls, particularly controls on inflows are prevalent. In turn this suggests that any evaluation of the efficacy of capital controls should take into account the possibility that they may be evaded through such means. Indeed to the extent that non-financial firms may issue abroad and are able to deposit the funds in the local financial system, evading any capital controls in place, then arguably macro-prudential policies applied on local financial systems may be more effective than those controls in managing such risks. In countries where non-financial firms are behaving in this fashion then their activities should be monitored closely and any systemic risks, either in terms of currency mismatches or liquidity risks, should also be carefully assessed.

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Tables and Figures

Table 1: Summary Statistics

	N. Obs	Mean	Std. Dev.	Min	Max
Full sample					
Total Bond Issuances	8248	117.09	693.32	0.00	15332
Local Currency Bond Issuances	8248	71.88	497.02	0.00	14820
Foreign Currency Bond Issuances	8248	45.21	369.38	0.00	11000
Total Assets	8248	5393.02	17298.59	3.87	408462
Total Debt	8248	1485.29	4521.64	0.00	112168
Firm-years with issuances (13% of observations)					
Total Bond Issuances	1041	927.69	1749.01	0.07	15332
Total Assets	1041	18890.86	38251.78	46.49	408462
Total Debt	1041	5769.81	9928.07	12.15	112168
Firm-years with local currency issuances (10% of observations)					
Local Currency Bond Issuances	854	694.19	1398.51	0.07	14820
Total Assets	854	18649.13	38824.31	46.49	408462
Total Debt	854	5754.07	9702.23	12.15	94793
Firm-years with foreign currency issuances (5% of observations)					
Foreign Currency Bond Issuances	392	951.24	1419.07	1.50	11000
Total Assets	392	35144.74	56808.21	454.11	408462
Total Debt	392	10476.81	14239.93	21.40	112168

Table 2: Foreign Currency Bond Issuances and Cash Holdings

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are three definition of foreign currency bond issuances (FXB), the demeaned spread between local deposit rate and borrowing costs in the US (SP), a dummy variable that takes a value of one if SP is above the sample median (HS), a dummy variable that takes a value of one if SP is below the sample median (LS), the log of total debt over sales, the log of total sales, and leverage. All regressions control for firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FXB	0.0148*	0.0144*		0.791**	0.832**		0.110**	0.108**	
	(0.00852)	(0.00832)		(0.399)	(0.362)		(0.0504)	(0.0490)	
FXB*SP		0.00205			0.0584			0.0121	
		(0.00164)			(0.0555)			(0.00955)	
FXB*HS			0.0238**			1.004**			0.176***
			(0.0101)			(0.444)			(0.0597)
FXB*HS			0.00518			0.599			0.0455
			(0.0116)			(0.440)			(0.0675)
ln(debt/sales)	-0.0190	-0.0200	-0.0190	-0.0193	-0.0203	-0.0193	-0.0190	-0.0200	-0.0191
	(0.0198)	(0.0203)	(0.0198)	(0.0198)	(0.0203)	(0.0198)	(0.0198)	(0.0203)	(0.0198)
ln(sales)	-0.285***	-0.282***	-0.285***	-0.285***	-0.282***	-0.284***	-0.285***	-0.283***	-0.285***
	(0.0535)	(0.0562)	(0.0535)	(0.0536)	(0.0563)	(0.0535)	(0.0535)	(0.0562)	(0.0535)
Leverage	-648.7	-622.8	-645.5	-644.6	-621.2	-643.3	-650.8	-625.8	-648.0
	(460.8)	(468.8)	(461.3)	(459.9)	(467.4)	(460.2)	(460.8)	(468.8)	(461.4)
Observations	8,243	7,881	8,243	8,243	7,881	8,243	8,243	7,881	8,243
Number of firms	766	749	766	766	749	766	766	749	766
Firm Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FXB is		$ln(1+FXB)$			$ln\left(1+\frac{FXB}{Sales}\right)$			Dummy	

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Domestic versus foreign currency bonds

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are domestic currency bond issuances (DCB), three definition of foreign currency bond issuances (FXB), the demeaned spread between local deposit rate and borrowing costs in the US (SP), a dummy variable that takes a value of one if SP is above the sample median (HS), a dummy variable that takes a value of one if SP is below the sample median (LS), the log of total debt over sales, the log of total sales, and leverage. All regressions control for firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)	(5)
DCB	0.00175	0.00317	0.000602	0.00103	0.000437
	(0.00648)	(0.00680)	(0.00648)	(0.00649)	(0.00648)
DCB*SP		0.00142			
		(0.00164)			
FXB			0.0148*	0.790**	0.110**
			(0.00851)	(0.399)	(0.0504)
ln(debt/sales)	-0.0187	-0.0195	-0.0190	-0.0193	-0.0190
	(0.0198)	(0.0204)	(0.0198)	(0.0198)	(0.0198)
ln(sales)	-0.283***	-0.281***	-0.285***	-0.285***	-0.285***
	(0.0534)	(0.0561)	(0.0535)	(0.0536)	(0.0535)
Leverage	-648.4	-633.1	-649.4	-645.9	-651.3
	(460.5)	(467.9)	(460.6)	(459.7)	(460.7)
Number of firms	766	749	766	766	766
Firm Fixed effects	Yes	Yes	Yes	Yes	
Country year Fixed effects	Yes	Yes	Yes	Yes	0.101
DCB is			$ln(1+DCB)$		
FXB is			$ln(1+FXB)$	$ln\left(1+\frac{FXB}{Sales}\right)$	Dummy

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 4: The role of capital account openness

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are three definition of foreign currency bond issuances (FXB), the demeaned spread between local deposit rate and borrowing costs in the US (SP), the Chinn and Ito index of capital account openness (K). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)
FXB	0.0188	0.0229	-0.260	0.532	0.102	0.0899
	(0.0188)	(0.0167)	(0.683)	(0.744)	(0.109)	(0.106)
FXB*SP	0.00195	0.00861***	0.0799	0.458***	0.0120	0.0426**
	(0.00153)	(0.00297)	(0.0579)	(0.136)	(0.00929)	(0.0194)
FXB*K	-0.00870	-0.0257	2.373**	0.561	-0.00819	-0.0270
	(0.0362)	(0.0316)	(1.173)	(1.208)	(0.205)	(0.193)
FXB*SP*K		-0.0143**		-0.754***		-0.0686*
		(0.00592)		(0.245)		(0.0366)
Observations	7,881	7,881	7,881	7,881	7,881	7,881
Number of firms	749	749	749	749	749	749
Firm Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
$\phi+\delta$		-0.006		-0.29		-0.026
p-value		0.12		0.17		0.22
FXB is	$ln(1+FXB)$		$ln\left(1+\frac{FXB}{Sales}\right)$		Dummy	

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Different types of capital controls

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), the Fernández et al. index of capital account openness (K), the Fernández et al. index of capital account openness to inflows (KI), the Fernández et al. index of capital account openness to outflows (KO), the residuals of a regression of KI over K (KI_R). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects and country-year fixed effects..

	(1)	(2)	(3)	(4)	(5)	(6)
FXB	0.0342**	0.0177	0.0375***	0.00926	-0.0386	0.0843**
	(0.0146)	(0.0158)	(0.0143)	(0.0178)	(0.0332)	(0.0408)
FXB*SP	0.00801***	0.00898***	0.00628*	0.00959***	0.0232***	-0.0115
	(0.00295)	(0.00291)	(0.00344)	(0.00316)	(0.00753)	(0.0123)
FXB*K	-0.0442*				-0.00812	-0.00862
	(0.0261)				(0.0332)	(0.0334)
FXB*SP*K	-0.0126***				-0.00445	-0.00471
	(0.00476)				(0.00871)	(0.00881)
FXB*KI		-0.00611		0.0733*		
		(0.0279)		(0.0430)		
FXB*SP*KI		-0.0121***		-0.0249***		
		(0.00439)		(0.00932)		
FXB*KO			-0.0597**	-0.0702*		
			(0.0264)	(0.0414)		
FXB*SP*KO			-0.0119*	0.0159		
			(0.00686)	(0.0135)		
FXB*KI_R					0.122*	
					(0.0648)	
FXB*SP*KI_R					-0.0351*	
					(0.0187)	
FXB*KI_R						-0.123*
						(0.0653)
FXB*SP*KI_R						0.0347*
						(0.0189)
Observations	7,881	7,881	7,881	7,881	7,881	7,881
Number of firms	749	749	749	749	749	749
Firm Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
FXB is	$ln(1+FXB)$					

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 6: The role of Financial Depth

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), The doing business index of creditor rights (CR, the index rescaled to range between 0 and 1, with 1 indicating stronger creditors' rights), a measure of financial depth (FD is credit to the private sector over GDP in the year 2000), the Fernández et al. index of capital account openness to inflows (KI). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)
FXB	0.0758***	0.00555	0.0548*	0.00621
	(0.0293)	(0.0205)	(0.0300)	(0.0305)
FXB*SP	0.00250	-0.000876	0.0103**	0.00915
	(0.00377)	(0.00612)	(0.00415)	(0.00653)
FXB*CR	-0.104		-0.0743	
	(0.0730)		(0.0634)	
FXB*CR*SP	-0.0111		0.00346	
	(0.00931)		(0.0113)	
FXB*FD		-0.00445		0.00115
		(0.0175)		(0.0182)
FXB*FD*SP		-0.00264		-0.00129
		(0.00477)		(0.00500)
FXB*KI			0.00499	0.0165
			(0.0485)	(0.0438)
FXB*KI*SP			-0.0321***	-0.0147***
			(0.0112)	(0.00538)
Observations	5,471	6,261	5,471	6,261
Number of id	631	605	631	605
Firm Fixed effects	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes
FXB is	$ln(1+FXB)$			

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Sovereign Risk

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), numerical credit rating (RATING, the index is rescaled to range between 0 and 1, with 1 indicating AAA), the Fernández et al. index of capital account openness to inflows (KI). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)
FXB	0.0356	0.0422	0.0772*	0.0907**
	(0.0546)	(0.0545)	(0.0448)	(0.0447)
FXB*SP	0.00793	0.0128**	0.00565	0.0145**
	(0.00566)	(0.00641)	(0.00585)	(0.00632)
FXB*RATING	-0.0430	-0.0716	-0.106	-0.147
	(0.0912)	(0.0936)	(0.0744)	(0.0771)
FXB*RATING*SP	-0.0140	-0.00852	-0.0117	-0.0135
	(0.0110)	(0.0118)	(0.0122)	(0.0117)
FXB*KI		0.0291		0.0246
		(0.0368)		(0.0378)
FXB*KI*SP		-0.0145***		-0.0152***
		(0.00487)		(0.00506)
Observations	7,262	7,262	6,950	6,950
Number of id	699	699	699	699
Firm Fixed effects	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes
FXB is	$ln(1+FXB)$			
RATING is	S&P		Moody's	

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Different Regions

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), the Fernández et al. index of capital account to inflows (KI). All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects and country-year fixed effects. Column 1 focuses on Latin America, Column 2 on Asia and Column 3 on Emerging Europe.

	(1)	(2)	(3)
FXB	-0.0304	0.109***	0.0620
	(0.0218)	(0.0293)	(0.0771)
FXB*SP	0.0183***	0.0196***	0.0279
	(0.00360)	(0.00737)	(0.0193)
FXB*KI	0.102**	-0.162***	-0.0873
	(0.0417)	(0.0578)	(0.135)
FXB*SP*KI	-0.0250***	-0.0331**	-0.0682*
	(0.00553)	(0.0157)	(0.0365)
Observations	2,940	2,512	1,404
Number of firms	261	237	158
Firm Fixed effects	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes
FXB is		$ln(1+FXB)$	
Region	LAC	ASIA	EUROPE

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Endogenity

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), the Fernández et al. index of capital account openness (K) in 2008 (column 1), the Fernández et al. index of capital account openness to inflows (K) in 2008 (column 2), the time varying Fernández et al. index of capital account openness to inflows (K) instrumented with openness to outflows. All regressions control for the log of total debt over sales, the log of total sales, leverage, firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)
FXB	0.0480***	0.0487***	0.0499**	0.0510***
	(0.0177)	(0.0185)	(0.0222)	(0.0182)
FXB*SP	0.00907***	0.0114**	0.00744*	0.0124***
	(0.00339)	(0.00501)	(0.00436)	(0.00356)
FXB*K	-0.0471	-0.0453	-0.0654*	-0.0539*
	(0.0324)	(0.0328)	(0.0391)	(0.0323)
FXB*K*SPR	-0.0142*	-0.0174*	-0.00937	-0.0145***
	(0.00754)	(0.0101)	(0.00613)	(0.00505)
Observations	3,638	3,638	7,307	5,030
Number of firms	704	704	735	484
Firm FE	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes
Estimation	OLS	OLS	IV	IV
Capital account openness	Capital account openness in 2008	Openness to inflows in 2008	Time varying openness to inflows instrumented with time varying openness to outflows	
Estimation period	2009-14	2009-14	2000-13	2000-13
Sample	All Countries	All Countries	All Countries	Asia and Latin America

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Domestic and Foreign Currency Bond Issuances

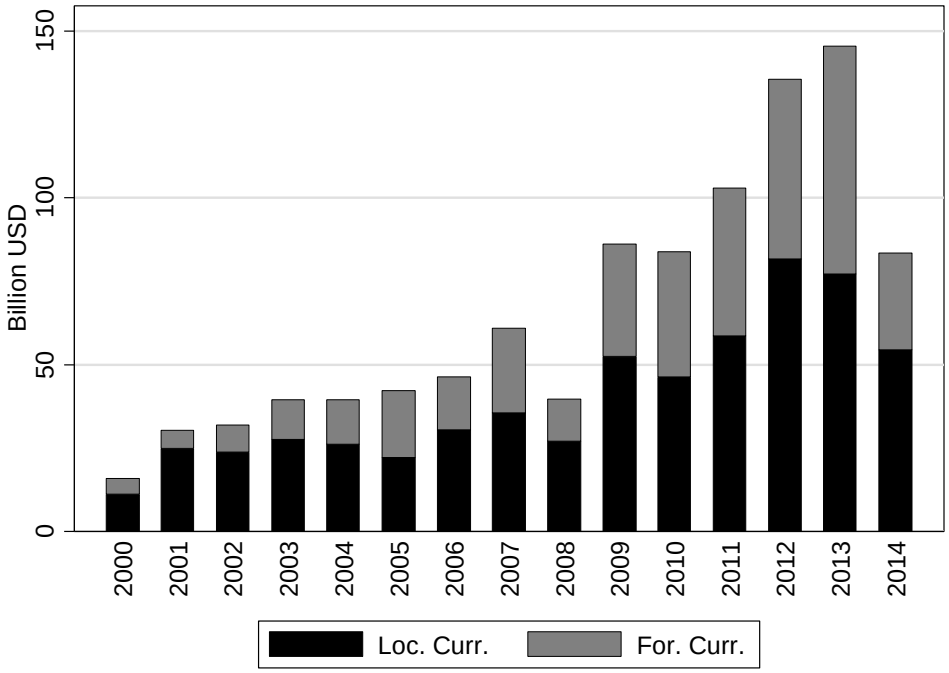


Figure 2: Evolution of capital account openness

This figure plots the evolution of different indexes of capital account openness for the sample of countries included in the regressions of this paper. In all graphs the solid line plots the median value of the index and the dashed lines plot the top and bottom 20th percentile of the index. Panel A uses the Chinn and Ito Index, Panel B the aggregate index of Fernandez et al., Panel C the Fernandez et al. index of openness to inflows, and Panel D the Fernandez et al. index of openness to outflows.

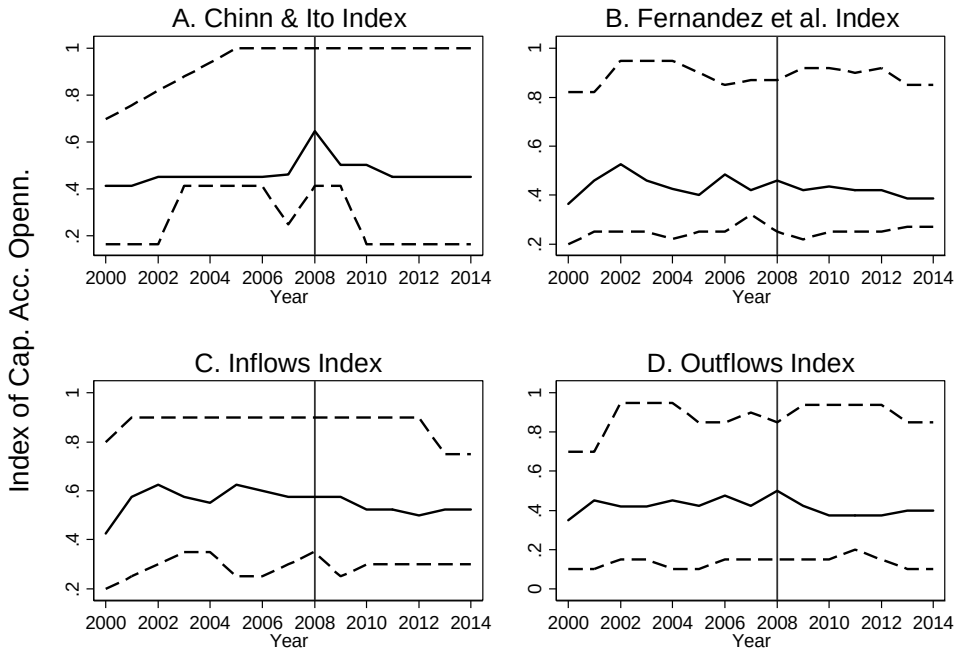
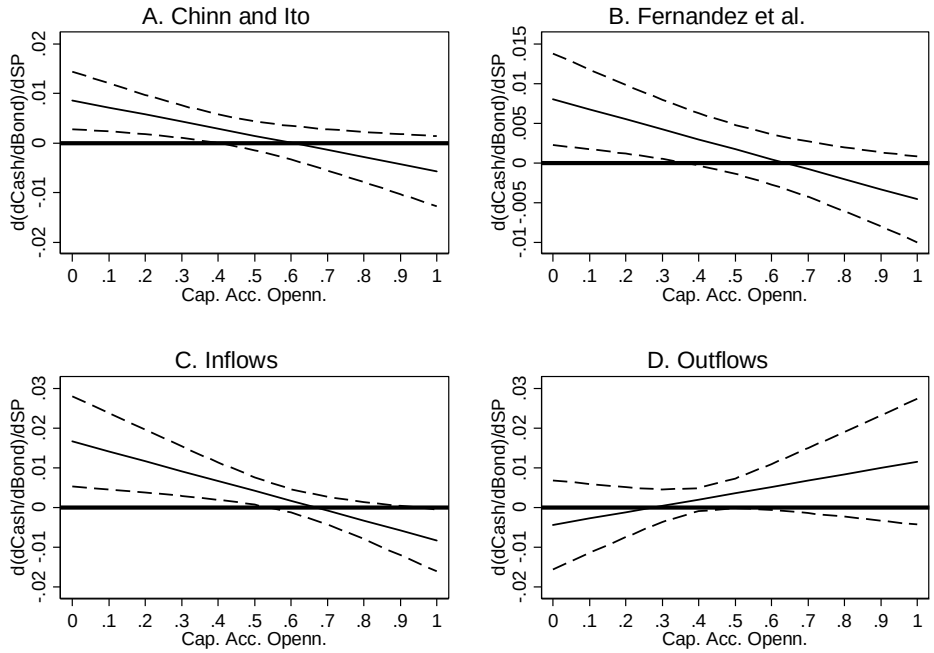


Figure 2: Marginal Effects

This figure plots how the sensitivity of the relationship between foreign bond issuances and cash holding to our spread variable varies with capital account openness. The solid line plots the main effect and the dashed lines are 95% confidence intervals. Panel A is uses the model of column 2, Table 4; Panel B uses the model of column 1, Table 5; and panels C and D use the model of column 4, Table 5.



Appendices

Table A1: Details Regarding the Sample of Firms Employed in the Regression Analysis

	All firms in sample	% of market capitalization	Number of issuers firms	Number of non-issuers
Argentina	47	100.0%	8	39
Brazil	49	80.2%	25	24
Chile	46	92.6%	17	29
Colombia	26	100.0%	6	20
Czech Republic	6	100.0%	1	5
Hungary	22	100.0%	1	21
Indonesia	47	81.1%	12	35
Israel	45	88.7%	4	41
Malaysia	45	81.8%	24	21
Mexico	43	96.9%	23	20
Peru	50	99.8%	8	42
Philippines	48	95.7%	13	35
Poland	48	87.7%	6	42
Russia	48	96.4%	19	29
South Africa	49	88.7%	13	36
South Korea	50	66.5%	24	26
Thailand	47	82.1%	23	24
Turkey	50	87.9%	3	47
Total	*766*		*230*	*536*

Table A2: Bruno and Shin regression

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between the change in cash holdings and assets at time t-1, and the explanatory variables are foreign currency bond issuances scaled by assets at time t-1 (BFX), the demeaned spread between local deposit rate and borrowing costs in the US (SP), two definition of capital account openness (the Chinn and Ito index in column 3 and the Fernandez et al. index of openness to inflows in column 4), the log of total assets, the log of other source of finance over total assets (ln(OTH)). All regressions control for firm fixed effects and country-year fixed effects.

	(1)	(2)	(3)	(4)
BFX	0.112*	0.116	0.186	0.218
	(0.0679)	(0.0723)	(0.143)	(0.139)
BFX*SP		0.00954	0.0729**	0.0738**
		(0.0126)	(0.0349)	(0.0313)
BFX*K			-0.210	
			(0.258)	
BFX*K*SP			-0.122*	
			(0.0626)	
BFX*KI				-0.150
				(0.235)
BFX*K*SP				-0.0951**
				(0.0453)
ln(TA)	-0.0388***	-0.0396***	-0.0396***	-0.0397***
	(0.0109)	(0.0116)	(0.0116)	(0.0116)
Ln(OTH)	0.269***	0.273***	0.273***	0.273***
	(0.0896)	(0.0908)	(0.0908)	(0.0908)
Observations	7,929	7,579	7,579	7,579
Number of firms	763	748	748	748
Firm FE	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table A3: Robustness analysis, dropping one country at a time append

This table reports the coefficients and standard errors of FXB*SP*KI in a set of regression identical to the model of column 2, Table 5. Each regression drops a country. The last column of the table list the country excluded from the regression.

Point estimate of FXB*SP*KI	Standard errors	Excluded Country
-0.0104	0.0050**	Argentina
-0.0291	0.0091***	Brazil
-0.0111	0.0045***	Chile
-0.0121	0.0044***	Colombia
-0.0088	0.0039**	Czech Republic
-0.0120	0.0044***	Hungary
-0.0118	0.0044***	Indonesia
-0.0141	0.0044***	Israel
-0.0119	0.0045***	Malaysia
-0.0100	0.0044***	Mexico
-0.0098	0.0045**	Peru
-0.0125	0.0046***	Philippines
-0.0121	0.0044***	Poland
-0.0130	0.0044***	Russia
-0.0121	0.0044***	South Africa
-0.0149	0.0051***	South Korea
-0.0133	0.0045***	Thailand
-0.0129	0.0043***	Turkey

Robust standard errors clustered at the firm level. *** p<0.01, ** p<0.05, * p<0.1

Table A4: Different Periods

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), the Fernández et al. index of capital account openness (K), the Fernández et al. index of capital account openness to inflows (KI), the log of total debt over sales, the log of total sales, and leverage. All regressions control for firm fixed effects and country-year fixed effects. Columns 1 and 2 focus on the 2007-2014 perid and columns 3 and 4 on the 2000-2006 period.

	(1)	(2)	(3)	(4)
FXB	0.0326**	0.0271*	0.0381*	0.0317
	(0.0156)	(0.0152)	(0.0206)	(0.0210)
FXB*SP	0.00926***	0.0114***	0.00823**	0.00768**
	(0.00318)	(0.00309)	(0.00382)	(0.00341)
FXB*K	-0.0358		-0.0349	
	(0.0321)		(0.0364)	
FXB*SP*K	-0.0211**		-0.0146**	
	(0.00869)		(0.00659)	
FXB*KI		-0.0224		-0.0173
		(0.0290)		(0.0366)
FXB*SP*KI		-0.0232***		-0.0112**
		(0.00720)		(0.00522)
ln(debt/sales)	-0.0111	-0.0110	-0.0268	-0.0268
	(0.0251)	(0.0251)	(0.0254)	(0.0254)
ln(sales)	-0.361***	-0.361***	-0.420***	-0.420***
	(0.0724)	(0.0723)	(0.0838)	(0.0838)
Leverage	417.3	394.9	196.9	197.3
	(669.6)	(669.1)	(385.1)	(385.3)
Observations	4,749	4,749	3,132	3,132
	707	707	570	570
Firm Fixed effects	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes
Period	2007-2014	2007-2014	2000-2006	2000-2006
FXB is	$ln(1+FXB)$			

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table A5: Effect at Time t+1

This table reports a set of firm-level regressions in which the dependent variable is the log of the ratio between cash holdings and sales, and the explanatory variables are foreign currency bond issuances (FXB, defined as ln(1+bond issuances)), the demeaned spread between local deposit rate and borrowing costs in the US (SP), the Fernández et al. index of capital account openness (K), the Fernández et al. index of capital account openness to inflows (KI), the log of total debt over sales, the log of total sales, and leverage. All regressions control for firm fixed effects and country-year fixed effects. In columns 1 and 2, all the explanatory variables are lagged, in columns 3 and 4 only FXB is lagged.

	(1)	(2)	(3)	(4)
FXB	0.0138	0.00142	0.00914	-0.00481
	(0.0146)	(0.0147)	(0.0149)	(0.0158)
FXB*SP	0.00722**	0.00722**	0.00734**	0.00743**
	(0.00345)	(0.00343)	(0.00305)	(0.00308)
FXB*K	-0.0406		-0.0285	
	(0.0280)		(0.0300)	
FXB*K*SP	-0.0132**		-0.0151**	
	(0.00632)		(0.00630)	
FXB*KI		-0.0109		0.00352
		(0.0264)		(0.0289)
FXB*K*SPI		-0.0109**		-0.0128**
		(0.00523)		(0.00544)
ln(debt/sales)	-0.0303	-0.0302	-0.0246	-0.0246
	(0.0187)	(0.0187)	(0.0212)	(0.0212)
ln(sales)	-0.190***	-0.190***	-0.254***	-0.254***
	(0.0541)	(0.0540)	(0.0609)	(0.0608)
Leverage	-461.2	-463.7	-882.8*	-880.7*
	(472.7)	(471.2)	(496.6)	(496.2)
Observations	7,137	7,137	7,114	7,114
Number of firms	731	731	738	738
Firm Fixed effects	Yes	Yes	Yes	Yes
Country year Fixed effects	Yes	Yes	Yes	Yes
Lags	All controls are lagged		Only FXB is lagged	
FXB is	$ln(1+FXB)$			

Robust standard errors clustered at the firm level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1