Corporate foreign bond issuance and interfirm loans in China

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Abstract

We use firm-level data to analyze international bond issuance by Chinese non-financial corporations, distinguishing those by sectors classed as 'risky'. Dollar issuance is positively correlated with the differential between domestic and foreign interest rates, and this effect is particularly strong for firms in risky sectors. Strikingly, firms in risky sectors use the proceeds to do more inter-firm lending than firms in non-risky sectors. Moreover, this lending rose significantly after the authorities sought to restrict the financial activities of risky firms in 2008-09. Firms in risky sectors compound risk by engaging in speculative activities that mimic the behavior of financial institutions while escaping prudential regulation.

Keywords: China, bond issuance in emerging market countries, carry trade, shadow banking

JEL Codes: F34, F32, G15, G30

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1 Introduction

The aftermath of the Global Financial Crisis was associated with a surge in foreign borrowing by emerging market (EM) nationals. Over 2007-2016, outstanding international bonds issued by nationals of developing countries increased from $1.1 trillion to over $3.1 trillion. Annual gross issuances, which stood at about $285 billion in 2007, surpassed $820 billion in 2016. Non-financial corporations (NFCs) played a key role in this surge in international bond issuances.[1] If interest rates were to rise in advanced economies, foreign currency debt could become a threat to financial stability in EM (Acharya and Steffen, 2015; Gozzi *et al.*, 2015; IMF, 2015; Alfaro *et al.*, 2019). Another source of concerns regarding financial stability in both EM and advanced countries is the growing importance of lightly regulated non-bank financial intermediation ('shadow banking') – see BIS (2020) and ESRB (2020).

Bruno and Shin (2017) study the drivers of foreign bond issuances and the use of funds arising from issuances in a wide sample of emerging market countries and advanced economies. In this paper we focus on China, for two reasons.

First, China dominates the post Global Financial Crisis increase in EM bond issuance. International bonds issued by Chinese nationals represented 3.5% of total outstanding international bonds issued by EM nationals in 2007 and were nearly 30% of the total in 2016. The dollar amount of bond issuances went from about $40 billion in 2007 to more than $400 billion in 2014 (Figure 1). Outstanding international bonds issued by Chinese NFCs increased from $9 billion in 2007 (3% of total outstanding international bonds issued by EM nationals' NFCs) to $534 billion in 2016 (65% of total outstanding international bonds issued by EM nationals' NFCs). The share of these bonds denominated in US dollars increased from 66% in 2007 to 85% in 2016.

[1] The stock of outstanding international bonds issued by NFCs increased from $355 billion (32% of total outstanding bonds) to $1.25 trillion in 2016 (40% of the total). The large majority of these bonds are denominated in US dollars, and the share of dollar-denominated bonds has increased from 79% (90% if we also include bonds denominated in euro) in 2007 to 83% (92% including bonds denominated in euro) in 2016.

Second, the Chinese domestic banking sector is highly regulated, with interest rate ceilings on both deposits and loans, and regulatory policy actions aim at directing loans towards or away from certain sectors. As regulatory pressure in the banking system has spurred the rapid growth of a more lightly regulated shadow banking sector, China has become a perfect laboratory to study how regulation can backfire and lead to inefficient forms of regulatory arbitrage.

This paper uses bond-level and firm-level data to document the main patterns of international bond issuances by Chinese NFCs. We find that the pattern of borrowing and the use of borrowed funds differed considerably between safe firms on the one hand and risky firms on the other. In particular, the latter engaged in carry trade borrowing: acting like financial institutions. This is a distinctive form of shadow banking which has so far escaped attention in the study of Chinese financial intermediation.

We start by analyzing the drivers of bond issuance and then describe how bond issuers use the proceeds. We show that, as expected, dollar bond issuances are positively correlated with firm size and leverage. We also find that firms that belong to risky economic sectors are more likely to issue dollar bonds. Surprisingly, exporters are less likely to issue dollar-denominated bonds despite their natural hedge against currency fluctuations. Dollar issuances are positively correlated with the excess of domestic over foreign interest rates. This interest rate differential increases the likelihood of dollar bond issuances by risky firms. Our findings are not in line with the hypothesis that firms choose their liability structure to minimize jointly funding cost and currency risk. We therefore conjecture that firms with limited profit opportunities (hence classed as risky) borrow abroad to generate financial profits through carry trade activities.

When we explore how firms use the proceeds from dollar bond issuances, we find that issuers of dollar bonds have lower investment rates and are more likely to lend to other firms. Next, we compare the behavior of safe firms with that of risky firms and find that the correlation between dollar bond issuances and inter-firm lending is stronger for the risky group (see also Jiang *et al.* 2010 , He *et al.* 2015 and Huang *et al.* 2018). These findings are consistent with the hypothesis that safe and profitable firms with good investment projects do not borrow much abroad. When they do so, they use the proceeds to finance their investment projects. Riskier

firms, instead, try to boost profitability by engaging in speculative activities that mimic the behavior of financial institutions while escaping prudential regulation that limits risk-taking by highly leveraged financial firms.

We conclude by showing that the surge in dollar borrowing by risky NFCs could have resulted from regulatory decisions which intended to limit their risk-taking by limiting their access to domestic funds. Instead, it drove them to borrow abroad.

The paper is related to several strands of the literature spanning financial depth and corporate financial structure, the credit cycle, and systemic macroeconomic financial risks. As do Shin and Zhao (2013) and Lin *et al.* (2013), we build on the corporate finance literature suggesting that firms normally use internal sources to finance projects or operations and seek outside funds only after internal funds are exhausted (Myers 1984). This "pecking order" implies that in NFCs, liabilities and liquid financial assets should be negatively correlated. This is the opposite of what happens for financial intermediaries that borrow to lend. A key paper in this line of research is Bruno and Shin (2017). They study the determinants of foreign bond issuances and find an important role for carry trade activities in EM countries but not in advanced economies. Caballero *et al.* (2015) show that this result is driven by the presence of capital controls which give lightly regulated NFCs a comparative advantage in moving funds across borders (see also McCauley, *et al.* 2013; Shin, 2014). Hardy and Saffie (2019) use data for a sample of Mexican firms and find that these firms borrow in foreign currency and engage in carry trade by extending trade credit to their customers and other firms.[2] Tang and Zhu (2016) show that investors import commodities and use them as collateral to earn a risk premium due to the presence of capital control and financing frictions.

Our work also relates to the literature on incomplete financial markets. Large EM-based financial corporations have better access to capital markets than smaller firms with which they have relationships. These large corporations may act as bankers for smaller firms by using the

[2] In the Chinese context, using bond issuance from the SDC database and firm-level data from Worldscope, Frank and Shen (2016) study the relationship between dollar bond issues and Chinese firms' leverage and investment decisions between 2000 and 2015. Their results show little evidence, however, of the carry trade activities we see elsewhere.

informational advantage that come from their business relationships. Because of the characteristics of the Chinese financial system, our paper is also related to the literature on the links between international bond issuances and capital controls (Gozzi, *et al.* 2010; Shin, 2014; Gruić, *et al.* 2014; Caballero, *et al.*, 2015; and Acharya and Vij, 2020).

Finally, this paper is related to the growing literature on the development of Chinese capital markets and shadow banking and on the unintended consequences of the Chinese fiscal stimulus (Acharya *et al*., 2016; Bai, *et al.*, 2016; Brunnermeier *et al.*, 2017; Du *et al*., 2016; Huang, *et al.* 2016, 2020; Flannery, *et al.* 2020, Allen *et al*., 2017; Chen, *et al*. 2020; Cong *et al.*, 2019; Gao, *et al*., 2020; and Allen *et al*., 2019).

Allen *et al.* (2019) study the market for entrusted loans over the period 2004-2013. They point out that China's strictly regulated banking system creates incentives for firms with access to cheap credit to act as credit intermediaries and show that entrusted loans are the typical financial instruments used for this purpose. This research and Acharya and Vij (2020) focus on the shadow banking characteristics of entrusted loans. Our discussion of entrusted loans in Section 5 below emphasizes the allocation of the loans (with likely inefficiencies), the evidence of regulatory arbitrage arising from a policy change, and the carry trade aspect of these loans.

2 Chinese firms' foreign currency bond issuances

From a global perspective, there was overwhelming dollar liquidity after the 2008 financial crisis, as suggested by the low borrowing cost on dollars. China reacted to the global financial crisis with a massive fiscal stimulus. In November 2008, the government announced a package worth 4 trillion Yuan (approximately $590 billion). The plan was implemented immediately. Most of the funds were channeled through local governments and funded with bank loans (Bai *et al.*, 2016, estimate that about 90 percent of local government investment was financed with bank loans in 2009). This policy action tightened the credit conditions faced by private firms (Huang, *et al.* 2020; Shu and Ye, 2018) and led to a rise in the shadow lending rate (Wenzhou rate) faced by Chinese firms, which increased from approximately 13% in the winter of 2009-

2010 to nearly 21% in mid-2011. The shadow rate fell in late 2011, but at 15% in 2016 it remained well above its pre-global financial crisis level of 10-11%. The regulated official lending rate, instead, did not change.

This period was also characterized by a set of regulatory reforms that tightened access to bank credit for firms that belong to economic sectors deemed to be risky or characterized by excess capacity. In a classic case of regulatory arbitrage, these policies contributed to the rapid growth of the Chinese shadow banking system (Chen *et al.*, 2018) and to the spike in the shadow lending rate documented above.

The increase in the shadow lending rate was soon followed by a sudden jump in the issuance of international foreign currency denominated bonds by Chinese NFCs. The stock of these bonds outstanding increased from $49 billion in early 2011 to $86 billion at the end of 2012 and exceeded $534 billion in 2016Q4. More than 90% by total value were denominated in US dollars, with the rest in euro, Singapore dollars and Hong Kong dollars. But the official data seem to underestimate the growth of foreign currency debt.[3] In this paper, we go beyond aggregate data and conduct a detailed analysis of the drivers of bond issuance by Chinese NFCs. We study the determinants and consequences of dollar bond issuance by merging bond-level data from Dealogic with firm-level data from China Stock Market and Accounting Research (CSMAR); we also use hand-collected data on entrusted loans.[4]

As a first step, we collect information on all bonds issued by Chinese nationals over the period 2005-15. The focus on nationals rather than residents is important because over 2009-15 there was a massive increase in international bond issuance by non-resident Chinese nationals (see Figure 1 and Shin, 2014, and Gruić, *et al.* 2014).

[3] We compared our foreign currency bond outstanding data from Dealogic with those of the BIS and the official Chinese foreign currency debt data. State Administration of Foreign Exchange (SAFE) discloses the exposure to foreign currency debt until 2014. Later, the definition has been changed to foreign claims on China, which is a broader concept. The comparison shows that the growth rate of foreign currency debt from Dealogic follows the BIS data trend, but it outpaces the official foreign currency debt growth. Given that the foreign currency loans were also growing, our data imply that the official data might underestimate the level and the growth of the foreign currency debt.

[4] We followed Chen *et al.* (2018) and collected the data by reading announcements of entrusted lending between non-financial firms over the period 2008-2015.

Our bond-level data contain 25,123 observations and include domestic and international issuances in all currencies by all types of issuers. The data for international issuance by Chinese nationals match the aggregate data published by the Bank for International Settlements (Figure 2). As we focus on non-financial sector listed firms, we exclude from our dataset all bonds issued by financial institutions and the central government (8,394 bonds) and all bonds issued by non-listed corporations (12,008 bonds).[5] Finally, we also drop from the sample a small number of bonds (176 in total) which are issued in currencies different from the US dollar or the RMB.[6] The resulting bond sample consists of 4,454 bonds from 1,353 issuers. About 85 percent of these bonds are denominated in RMB and the remaining 15 percent (557 bonds and 238 issuers) are denominated in US dollars.

Our data show that bond issuance by Chinese NFCs remained well below $200 billion until 2010 and then started increasing rapidly in 2012 and surpassed $900 billion in 2016. Dollar issuance also increased rapidly from $9 billion in 2008 to over $230 billion in 2016. The total number of bonds issued by NFCs increased from 100 in 2007 to 4,110 in 2016.

Next, we collect firm-level information from CSMAR. We start with a total of nearly 60,000 observations, and after restricting our sample to listed NFCs with complete data on revenues and inter-firm loans, we are left with approximately 32,815 observations covering 2,593 firms.

Finally, we manually match the bond-level and the firm-level data. We are able to recover information for most bond issuers, but there are 486 bonds (of which 78 are dollar-denominated bonds) for which we cannot find issuer data. Therefore, our final sample consists of 3,968 bonds (479 of these bonds are denominated in US dollars) and 22,419 firm-years (the number of observations used in the regressions ranges between 18,653 and 19,991 because the use of lags in the set of explanatory variables leads to a loss of observations and some control variables have missing observations). About one-third of the firms in our sample have issued at least one

[5] We focus on listed firms because we were unable to match bond issuances by non-listed firms with balance-sheet data.
[6] All our results are robust to keeping these 176 bonds issued in other currencies in the sample.

bond, and 6% of the firms in our sample have issued dollar-denominated bonds. For firms that issued more than one bond in a given year, we compute the weighted average of the yields of the various bonds (we use yield at issuance and weight the yield with the face value of the bond).

We also merge our firm-level data with data on entrusted loans. Our dataset includes 2,596 entrusted loans over 2008-15 with 461 creditors and 1,051 debtors.

Table A1 in the appendix provides definitions and sources for the all the variables used in the paper.

3 Determinants of dollar bond issuance

We describe what types of firms issue international dollar-denominated bonds with a simple set of linear probability models. We use OLS to regress a dummy that takes a value of one if firm *i* issues a dollar bond in year *t* on a set of firm characteristics (all lagged by one period), two measures of carry trade opportunities, and the interaction between firm characteristics and carry trade opportunities. Some of our regressions also include year and firm-fixed effects.[7]

The set of firm characteristics includes profitability (return on assets, ROA), leverage (total debt over assets), firm size (proxied by the log of total assets), foreign exposure (proxied by exports over revenues), and a dummy variable that takes a value of one for firms that belong to sectors that China's Ministry of Industry and Information Technology (CMIIT) has defined as "risky". These include real estate and other sectors which, according to CMIIT, are characterized by excess capacity. We manually code the various sectors as risky using CMIIT's definition (Table A2). All regressions are estimated with robust standard errors clustered at the firm and year level.

The measures of carry trade opportunities are the Bloomberg Carry Trade Performance Index (this index measures the 3-month return of borrowing in USD and investing in RMB) and the Wenzhou index of private lending interest rates in the Chinese shadow banking system.

[7] In all regressions, we winsorize the data at 2%.

In our baseline regressions, we find that the likelihood of issuing dollar bonds is positively correlated with profitability, leverage and firm size (Columns 1 and 2 of Table 1). This is not surprising. Leveraged firms are more likely to seek different types of financial resources, and large firms can more easily cover the fixed costs linked to issuing abroad. What is surprising is that our regressions indicate that firms with high foreign exposure (*i.e.*, firms that have a natural hedge when they borrow in foreign currency) are less likely to issue dollar bonds, and firms in risky sectors (which often produce non-tradable goods) are more likely to issue dollar bonds. We return later to the second observation and its consequences.

We also find that the Bloomberg carry trade performance index and the Wenzhou shadow interest rate are positively correlated with the likelihood of issuing dollar bonds. The close correlation between carry trade returns and the likelihood of issuing dollar bonds can also be seen by estimating the same regression of the first column of Table 1 with year fixed effects replacing the carry trade index and then plotting the fixed effects against the index (Figure 3).

The observed correlation between carry trade returns and dollar bond issuances could be spurious, driven by the fact that the Chinese financial system began its slow internationalization process in a period of low and decreasing dollar interest rates. Alternatively, in the presence of deviations from uncovered interest parity, the large and growing difference between RMB and dollar rates could be the driver of dollar bond issuances. We explore these two explanations by interacting the demeaned carry trade (column 3) and shadow rate (column 4) indexes with firm characteristics. Formally, we estimate the following model:

$$ISSUER_{i,t} = X_{i,t-1}\Gamma + \widetilde{ct}_t' X_{i,t-1}\Psi + \delta\widetilde{ct}_t + \varepsilon_{i,t} \qquad (1)$$

$ISSUER$ is a dummy variable that takes the value one if firm i issues a dollar bond in year t, $X_{i,t-1}$ is a matrix of firm characteristics, and $\widetilde{ct}_t$ is the demeaned carry trade (or shadow rate) index.[8] We remove the mean from the index so that the coefficients of the non-interacted

[8] We define $\widetilde{ct}_t = ct_t - \overline{ct}$, where ct_t is the carry trade index in year t and $\overline{ct}$ is the average value of the carry trade index.

variables (the matrix Γ) measure the effect of firm characteristics when carry trade opportunities are at their mean value, and the coefficients of the interacted variables (the matrix Ψ) measure how changes in carry trade opportunities affect the relationship between firm characteristics and the likelihood of issuing dollar bonds. Note that we do not remove the mean from the matrix of firm characteristics. Hence, δ has no natural interpretation, as it measures the effect of the carry trade index when $X=0$. We also estimate versions of (1) which include firm and year fixed effects. With year fixed effects, we cannot estimate the parameter δ and with firm fixed effects, we cannot estimate the main effect of belonging to a risky sector. However, the fixed effects regressions estimate the within-firm and within-year relationship of the interactions between firm characteristics and the two measures of carry trade opportunities, and they somewhat allay the spurious correlation problem mentioned above.

In columns 3 and 4 of Table 1, most of the coefficients of the non-interacted firm-level variables are close to those of columns 1 and 2 (the exception is leverage, which now has coefficients which are about one-third those of columns 1 and 2 and are no longer statistically significant).

The direct effects of the shadow rate and the carry trade return index, which were positive and statistically significant in columns 1 and 2, are now negative. But these coefficients now measure the correlation between potential carry trade returns and dollar bond issuances when all other control variables are set equal to zero. Hence, by themselves, they have no natural interpretation. What matters is the interaction with the firm specific variables (the matrix Ψ).[9]

In the presence of large return differentials, dollar issuances can substantially reduce funding costs. This is a risky strategy, however, because a sudden dollar appreciation may lead to large losses through negative balance sheet effects. Exporters have a natural hedge against currency depreciation and, other things equal, are in a better position to exploit return

[9] If we estimate Equation (1) by only interacting the carry trade index with the "risky" dummy, we find that the coefficient of the main effect is positive but close to zero and not statistically significant (the point estimate is 0.003 and the t-statistic is 0.64) while the interacted coefficient is both large (0.058) and highly significant (t-statistic 3.66). These results suggest that the positive correlation between the carry trade return index and dollar bond issuances holds only for firms that belong to risky sectors.

differentials by issuing dollar bonds. The same applies to large and profitable firms which have a greater capacity to absorb losses brought about by negative balance sheet effects. The opposite should instead be true for more fragile firms that are either highly leveraged or belong to risky sectors.

Our results partly support these priors, and they suggest another story. We find that higher interest rate differentials increase the likelihood that profitable and large firms issue dollar bonds, while the results for other firm characteristics are not in line with what prudent debt management would suggest. Firms that operate in risky sectors and leveraged firms are more likely to issue dollar bonds when carry trade returns are high, and the interaction between foreign exposure and carry trade returns is negative, albeit not statistically significant. The last two columns of Table 1 show that these results for the interacted variables are robust to controlling for firm and year fixed effects. In fact, in this case we find that the interaction between foreign exposure and carry trade return remains negative but becomes statistically significant. Note that all results are robust to substituting the issuer dummy with the value of total issuances (Table A3).

These results suggest that firms may *not* choose their liability structure to minimize jointly funding cost and exchange rate risk. Instead, firms with limited investment opportunities may borrow abroad not to finance investment projects, but to generate financial profits through carry trade activities. Alternatively, risky firms may borrow abroad to evade regulations that prevent them from tapping the domestic financial market; we return to this in Section 5. We now examine the uses of funds borrowed in the dollar bond market.

4 Use of proceeds

We investigate what issuers do with the proceeds of dollar bond issuances. Financial frictions make external funds more expensive than internal funds and generate a "pecking order" for firm financing. NFCs normally use internal sources to finance projects or operations and seek outside funds only when those are exhausted (Myers 1984). Banks borrow to lend, and their balance sheets show a positive correlation between financial assets (mostly loans) and financial liabilities (deposits or other forms of debt for non-deposit taking financial institutions). Instead, NFCs should borrow to invest (or to finance current expenditure), and their debt liabilities should be negatively correlated with their liquid financial assets (Shin and Zhao 2013).

As bonded debt normally has longer maturity than the typical bank overdraft (the average maturity in our sample of dollar-denominated bonds is seven years), dollar bond issuances should be positively correlated with fixed investment. We test this hypothesis by estimating the following model:

$$CAPEX_{i,t} = \beta ISSUER_{i,t-1} + X_{i,t-1}\Gamma + \alpha_i + \tau_t + \varepsilon_{i,t} \qquad (2)$$

where the dependent variable is investment in fixed assets over lagged total assets, ISSUER measures bond issuances in the previous year, $\boldsymbol{X}$ is a matrix of lagged firm characteristics (ROA, leverage, size and a variable which captures other sources of funds as in Erel *et al.*, 2012), and α_i and τ_t are firm and year fixed effects. We use robust standard errors double clustered at the firm and year level.

We use three definitions of ISSUER: (i) a dummy variable that takes value one if the firm has issued a dollar bond in a given year (columns 1 and 2 of Table 2); (ii) amount of dollar bond issuances over revenues (columns 3 and 4); and (iii) outstanding dollar bonds over revenues (column 5 and 6). Columns 1, 3, and 5 of Table 2 show that there is a *negative* correlation between dollar bond issuance and investment in fixed assets (we obtain the same

result if we also include R&D expenditure). While this negative correlation is statistically significant only in the first column, there is clearly no indication that firms that issue dollar bonds invest more than non-issuers.

Columns 2, 4, and 6 interact bond issuance with the carry trade index (as before, we remove the mean from the index). We find that the interactive term is never statistically significant and that in most cases, the inclusion of this interactive term does not affect the correlation between bond issuance and fixed investment (the exception is the last column of the table where the correlation goes from being negative and insignificant to being positive and insignificant). We conclude that, on average, *listed Chinese NFCs do not issue dollar bonds to invest in fixed assets.*

Shin and Zhao (2013) and Bruno and Shin (2015a, b) have argued that EM-based NFCs often act like financial intermediaries and instead of borrowing to invest, they borrow to lend. They test their hypothesis by regressing cash-in-hand (a measure of liquid financial assets) divided by lagged revenues over the same set of controls as in Equation (1).

Table 3 uses a specification similar to that of Shin and Zhao (2013) and does not find a significant positive correlation between dollar bond issuance and cash holding.[10] In fact, the correlation is often negative, albeit never statistically significant (columns 1, 3, 5). We also find no evidence that the correlation between USD bond issuances and cash holdings becomes stronger when there is a large difference between domestic and dollar interest rates (columns 2, 4, and 6).

There are two possible explanations for the finding that unlike firms in other EM economies, Chinese firms that issue dollar bonds do not hold more cash. The first explanation might be that these Chinese firms do not engage in the carry trade activities that seem to characterize firms in other emerging market countries. The second explanation relates to the particular nature of the Chinese banking system. While a Brazilian (say) firm can earn carry trade returns by borrowing in US dollars and depositing the money in the domestic financial

[10] Note that cash holdings include several types of liquid financial assets but do not include holdings of wealth management products.

system, in China this strategy is unlikely to maximize carry trade profit, because Chinese bank deposit and lending rates are capped well below the market rate. As the gap between the official lending rate and the shadow lending can be as high as 14 percentage points (Figure 4), *an NFC that wants to maximize carry trade returns is more likely to lend to other firms*, either directly or through entrusted loans (Allen, *et al.* 2019).

To test for this possibility, we estimate a set of models similar to those of Table 2 with inter-firm loans instead of cash-at-hand as dependent variable.[11] Table 4 shows that there is a positive correlation between dollar bond issuances and inter-firm loans. While this correlation is not statistically significant when we use the issuer dummy (column 1), it is statistically significant at the 1% confidence level when we use yearly issuances or outstanding bonds (columns 3 and 5). We also find that this correlation becomes stronger when returns from carry trade are higher (columns 4 and 6)

Domestic credit conditions also affect inter-firm loans. If the domestic unsecured interest rate is sufficiently higher than that in the international market, firms with access to the dollar bond market would invest the offshore money in the domestic market to earn a higher expected return. The last two columns of Table 4 show how the dollar bond issuers take advantage of the domestic shadow rate to conduct inter-firm loans. The interaction term between shadow rate and USD issuer is significantly positive, suggesting that a higher domestic shadow rate triggers the USD issuers to conduct more inter-firm loans.

The results of Table 4 are thus consistent with the hypothesis that Chinese firms that issue dollar bonds act as financial intermediaries. Instead of simply depositing the borrowed funds in the domestic banking system, however, they use the borrowed funds to on lend to other firms. As one might expect, this behavior is more pronounced when the returns from the carry trade are higher.

[11] We use "other receivables" over revenues. Following Jiang *et al.* (2010), we measure interfirm loans with "Other Receivables" (OREC). They show that these loans represent between 7% and 12% of reported assets for listed Chinese companies over the period of their study and nearly one-third of assets for firms in the top decile of the total asset distribution.

One possible reservation in the interpretation of Table 4 is that there might be nothing special about firms that issue dollar bonds. Firms that issue bonds in whatever currency may be different from non-issuers. While this possibility should be mitigated by our controlling for both firm fixed effects and time-varying firm characteristics, we explore it specifically by augmenting our regressions with a set of variables that control for RMB bond issuance.[12]

Table 5 at first suggests that there might indeed be something special about bond issuers as such, since we find a positive correlation between RMB bond issuance and interfirm-loans. But controlling for RMB bond issuance does not affect the baseline results, and the RMB coefficients are much smaller than the USD coefficient. Moreover, we find that carry trade opportunities have no effect on the correlation between RMB bond issuances and inter-firm loans, while they strengthen the correlation between dollar bond issuances and interfirm loans. This is significant confirmation of our preliminary conclusion: dollar bond issuances are used to finance loans to other firms in a domestic carry trade.

So far, we have shown that the correlation between bond issuances and interfirm lending is weaker when we use an issuer dummy (columns 1, 2, and 7 of Table 4) than when we use the amount of bond issuances or outstanding bonds (columns 3-6 and 8 and 9 of Table 4). In the first case, we focus on the extensive margin (*i.e.*, we differentiate between firms that issue and do not issue bonds) and in the latter case, we mix the intensive and the extensive margins. Specifically, we assume that a given bond issuance has the same effect for firms that are issuing for the first time and for each extra dollar of issued amount. We probe further, by separating the two effects and jointly controlling for an issuer dummy and for the total amount issued in a given year (columns 1 and 2 of Table 6) or total outstanding amount (columns 3 and 4 of Table 6). We find that *it is the intensive margin that matters*. Firms that issue more dollar bonds or have a larger stock of outstanding dollar bonds tend to lend more to other firms.[13]

[12] We use the same three definitions of bond issuers that we use for dollar issuer (a dummy taking value one for issuer, amount of issuances over revenues, and outstanding bonds over revenues).
[13] If we estimate the same models of Table 6 using capital expenditure as the dependent variable, we find that there is no statistically significant correlation between dollar bond issuances (extensive and intensive margin) and capital expenditure.

In Table 1, we found that riskier firms are more likely to issue dollar bonds when there are large potential returns from carry trade activities. The results in Tables 2 and 4, which show that dollar bond issuances are negatively correlated with capital expenditure and positively correlated with inter-firm loans, are also consistent with the presence of carry trade activities.

We now check whether the correlation between dollar bond issuances and interfirm loans (our 'smoking gun' for carry trade activities) is stronger for riskier and less profitable firms. We start by estimating the baseline model of Table 4 (column 1) augmented with the interaction between the issuer variables (we use the issuer dummy and issuances over revenues) and firm profitability. As before, we find that inter-firm loans are positively correlated with bond issuance, with the results being statistically significant when we measure dollar issuances with one of the two continuous variables (Table 7, column 1). More interestingly, we find that the correlation between dollar issuances and interfirm loans is lower for more profitable firms (the coefficient of the interactive term is negative but not statistically significant in the top panel of column 1 and negative and statistically significant in panels B and C of column 1). This finding suggests that *only non-profitable firms issue dollar bonds to engage in inter-firm lending activities.*

In column 2, we interact dollar issuance with the risky sector dummy and find that firms in risky sectors that issue dollar bonds are more likely to engage in dollar lending (the same holds for firms with high stock market valuation, proxied by Tobin's Q, column 3). While bond maturity does not matter for the correlation between bond issuances and interfirm lending, we find that state-owned enterprises that issue dollar bonds are less likely to engage in interfirm lending (column 4).

The results of Tables 1-7 can be summarized as follows: (i) *Riskier firms are more likely to issue dollar bonds*, and they are more likely to do so when returns to carry trade are high; (ii) on average, *firms that issue dollar bonds are more likely to lend to other firms* and are not more likely to invest in fixed capital; (iii) but the *correlation between dollar bond issuance and inter-firm lending holds only for risky firms with low profitability*, not for safe and profitable firms .

These findings paint a consistent picture in which safe and profitable firms with good investment projects do not borrow much abroad, and when they do so they use the funds to finance investment projects. Riskier firms, instead, try to boost profitability by engaging in speculative activities that mimic the behavior of financial institutions. They operate as part of the shadow banking system, escaping the prudential regulation that limits risk taking by leveraged financial firms.

A natural reaction to this state of affairs is to propose regulating these firms, preventing them from taking too much risk. Regulation, however, is always complex. When it is not well implemented it can backfire. Perhaps the rapid increase of dollar issuances by risky firms was the outcome of regulatory reforms aimed at limiting risk-taking by this type of firm. We now consider this possibility.

5 The unintended consequences of prudential regulation: evidence from entrusted loans

Worried about increasing corporate financial vulnerability, on 22 December 2009, China's regulatory authorities jointly released a document titled *Guiding Opinions on Further Strengthening Financial Services With a View to Supporting the Adjustment and Rejuvenation of Some Key Industries and Restraining Excess Capacity in Other Industries* (PBC Document No.386 [2009]).[14] This stated that "in order to serve the overall objective of supporting economic growth and restructuring the economy," the People's Bank of China will "enhance surveillance on credit structure," and "effectively contain overcapacity." The authorities tightened access to domestic credit (bank loans and issuance of securities) for firms that operate in economic sectors that are deemed to be risky (Table A2). On 28 May 2010, the People's Bank of China and the China Banking Regulatory Commission issued a joint regulation titled "Notice on Financial Services to Further Support Energy Saving and Eliminate the Backward-

[14] http://www.pbc.gov.cn/english/130721/2872680/index.html

Production Capacity", which further restrained access to credit for firms that operate in risky sectors.

This seems to have stimulated classic regulatory arbitrage, because there is evidence that these policies contributed to the rapid growth of the Chinese shadow banking system. Chen *et al.* (2018) show that the share of entrusted loans (a typical shadow banking instrument in China) in total bank lending tripled during the tightening period, and more than 60% of these entrusted loans were channeled to firms that operate in risky sectors.

Here we study a different aspect of regulatory arbitrage. We use the policy shock of 2009-10 as a means of identification. Specifically, we test whether the regulatory reforms of 2009-10 increased the likelihood that risky firms issue dollar bonds and then use the proceeds to onlend to domestic firms.

The rationale for our approach is that information asymmetries are paramount in the shadow banking system, but these information asymmetries are likely to be less important for firms that operate in the same sector. If firms are more likely to fund firms that operate in similar sectors, we should observe a surge in interfirm lending by firms that operate in sectors subject to this regulatory tightening (*i.e.*, firms that operate in risky sectors) but can escape the tightening by borrowing abroad.

To test this hypothesis, we proceed in two steps. We first use a novel database on interfirm entrusted loans to show that that it is indeed the case that firms that operate in one sector tend to lend more to firms that operate in the same sector and that this is especially the case for firms that operate in risky sectors. Next, we conduct a difference-in-difference analysis to study whether the regulatory tightening of 2009-10 did indeed lead to an increase in interfirm loans by dollar bond issuers which operate in risky sectors.

5.1 Who lends to whom?

As mentioned above, our empirical strategy depends on the assumption that firms that operate in a given sector are more likely to lend to firms that operate in the same sector. This hypothesis

cannot be tested using balance sheet data which report only the total amount of interfirm loans but provide no information on the counterparty.

We address this issue by using a dataset on entrusted loans which includes information on both the borrower and lender characteristics. Entrusted loans are loans extended by an NFC to another NFC and are serviced by a bank. While the bank charges a fee for its services, the lender carries the credit risk.

While entrusted loans have existed since the early 2000s, their amount started growing rapidly around 2010, and for a few years they were the largest component of China's shadow banking system (in 2014 they were surpassed by wealth management products). Entrusted loans were eventually banned in 2018 when they amounted to approximately 13 trillion yuan (more than $2 trillion).

Allen *et al.* (2019) study the market for entrusted loans over the period 2004-2013. They point out that China's strictly regulated banking system creates incentives for firms with access to cheap credit to act as credit intermediaries and show that entrusted loans are the typical financial instruments used for this purpose. This research and Acharya and Vij (2020) focus on the shadow banking characteristics of entrusted loans. Here and below, we emphasize the allocation of the loans (with likely inefficiencies), the evidence of regulatory arbitrage arising from a policy change, and the carry trade aspect of these loans.

We use data on 2,596 entrusted loans spanning the period 2008-2015, with most observations (96% of the total) concentrated over 2010-15. As we are interested in comparing borrower and lender characteristics, we follow the approach suggested by Chen *et al.* (2018) and collect data from the raw announcements, while Allen *et al.* (2019) obtain information from firms' annual reports.

We start by comparing how lenders and borrowers in the dataset of entrusted loans are matched by industry and cities with what we would find if lenders and borrowers were randomly matched (we build random matches with Monte Carlo simulations with 1000 draws). See Table 8. In the full dataset, about one quarter (24.8%) of the borrower-lender pairs belong to the same industry, and nearly 40% (39.5%) are for firms located in the same city. These

values are much larger than what we would find in the presence of random matching. In that case, only 4.1% of pairs would belong to the same industry (the 95% confidence interval is 3.1%-5.1%) and 2.3% of pairs would be for firms located in the same city (the 95% confidence interval is 1.7%-2.9%). If we focus only on borrowers which are not affiliates of the lender, we still find that 21% of pairs consist of firms that belong to the same industry, and 41% of pairs are for firms which are located in the same city.

Focusing on pairs where the lender belongs to a risky sector, we find that 43% of lender-borrower pairs belong to the same sector. This is nearly four times what we would observe if the matching were random (11.9% with a 95% confidence interval of 8.5%-15.4%). Nearly 42% of pairs are for firms located in the same city (random matching would predict 2.5% of firms located in the same city). Focusing on non-affiliated pairs, we still find that 39% of pairs include firms that belong to the same industry, and 40% of pairs consist of firms which are located in the same city.

These findings are in line with our hypothesis that firms tend to lend disproportionately to firms that operate in the same industry; information asymmetries may be further reduced if they are located in the same city. This is especially the case for lenders that operate in risky sectors.

Next, we explore how lender-borrower pair characteristics affect entrusted loans by focusing on the loan amount, maturity, presence of collateral, and interest rate. We find that entrusted loans for which lenders and borrowers belong to the same industry and are located in the same city tend to be larger, and this is also the case for loans in which the borrower belongs to a risky industry (column 1 of Table 9). Entrusted loans among affiliates tend to be of smaller size (possibly because the fixed costs associated with these loans are smaller). Borrower size (log of total assets) is positively correlated with loan amount, while borrower profitability is negatively correlated with loan amount (column 5 of Table 9). When we control for these variables, the sample drops to 632 observations, and we find that the same-industry, same-city, and risky dummies are no longer statistically significant; but this is only one-fourth of our original sample.

If we separate the same industry effect into risky and non-risky sectors, we find that this effect is statistically significant only for pairs that operate in risky sectors (column 1, Table A5 in the Appendix). The same city effect is instead statistically significant for both risky and non-risky sector but is 50% larger for firms that operate in risky sectors.

Focusing on maturity, we find shorter maturity for entrusted loans between firms located in the same city and for loans where the borrower belongs to a risky sector (column 2, Table 9). Loans between affiliates, instead, tend to have longer maturity, but belonging to the same industry is not significantly correlated with loan maturity (the correlation with loan maturity is negative and statistically significant if both firms belong to the same risky industry, Column 2 Table A5). Maturity tends to be shorter for larger borrowers and longer for more profitable borrowers (column 6, Table 9).

Focusing on collateral requirements, we find that loans between firms that belong to the same industry are less likely to be collateralized, and that this is also the case for loans between affiliates (column 3, Table 9). Borrower size and profitability are not significantly correlated with collateralization, but when we control for these variables, we find that borrowers that belong to risky sectors are more likely to face collateral requirements (column 7, Table 9).

Finally, we find that entrusted loans between firms in the same industry tend to have lower interest rates and that this is also the case for loans between affiliates (Allen *et al.* 2019, find the same using a different dataset). Borrowers that belong to risky sectors, instead, tend to face higher interest rates (columns 4 and 8 Table 9). By splitting the coefficients between firms that belong to risky and non-risky sectors, we find that the reduction in interest rate associated to being in the same sector is between two and three times larger for firms that operate in risky sectors (columns 4 and 8 of Table A5 in the Appendix).[15]

[15] In the regressions of Tables 1-6, we used the Bloomberg carry trade index and the shadow rate to represent potential returns from carry trade. As an alternative, we computed two different spreads, one for dollar issuers by comparing the average interest rate on dollar bonds in our dataset with that of RMB denominated entrusted loans, and one for RMB issuers by comparing the average interest rate on RMB bonds in our dataset with that of RMB denominated entrusted loans. The first spread captures carry trade opportunities linked to borrowing in dollars and lending in RMB, and the second the potential benefits

5.2 A test of regulatory arbitrage

Having established that firms that operate in the same sector are more likely to lend to each other and at lower interest rates, and that this is especially the case for firms that operate in sectors targeted by the 2009-10 regulatory tightening, we now check if this regulatory tightening altered the behavior of firms with access to dollar borrowing.

When firms in risky sectors face tighter domestic credit conditions, while some large firms that belong to risky sectors are unconstrained as they have access to the international capital market, these large firms can exploit their knowledge of credit-constrained firms that operate in similar sectors by borrowing abroad and then on lending to them.

We start by testing whether the policy has tightened the correlation between dollar bond issuance and interfirm lending by testing the following difference-in-difference specification:

$$IFL_{i,t} = ISSUER_{t-1,i}(\beta + \delta POLICY_t) + X_{t-1,i}\Gamma + \alpha_i + \tau_t + \varepsilon_{i,t} \qquad (3)$$

Here *IFL* measures inter-firm loans scaled by revenues, *ISSUER* is a dummy variable that takes the value one for firms that issued dollar bonds in year t-1, *POLICY* is a dummy variable that takes the value zero for the period 2006-2009 and the value one for the period 2010-2014, *X* is a matrix of time-varying firm controls and α and τ are firm and year fixed-effects. Our parameter of interest is δ, which measures whether the policy had a differential effect for firms that issue dollar bonds.

We start by estimating Equation (3) without including year fixed effects and including the non-interactive POLICY dummy. We find that there is a strong positive correlation between

of financial intermediation by firms with easy access to RMB funds. We then use these spreads to estimate a set of regressions similar to those of Tables 4 and 5. We confirm our previous results that the correlation between dollar bond issuances is higher when returns from carry trade are higher and that this result holds when we control for RMB issuances (Tables A7 and Table A8).

dollar issuance and interfirm lending for issuers after the policy is introduced and no correlation for non-issuers after the policy (column 1 of Table 10, where the coefficient is negative but not statistically significant). We also corroborate our previous result that more profitable firms are less likely to engage in interfirm lending. These results are robust to controlling for year fixed effects (a specification that does not allow for controlling for the main effect of POLICY, Column 2, Table 10).

Next, we estimate a variation of Equation (3) in which we substitute the issuer dummy with a risky sector dummy (the main effect of the risky sector dummy is absorbed by the firm fixed effects). Columns 3 and 4 of Table 10 show that, when we pool issuers with non-issuer together the credit tightening policy has no effect on the correlation between interfirm lending and belonging to a risky sector.

We now use two approaches to evaluate how the policy affected firms that are both issuers and belong to risky sectors. We first estimate the model of Equation (3) by splitting the sample between firms that belong to risky sectors and firms that do not belong to risky sectors. Columns 5 and 6 of Table 10 show that policy had a very large impact for the sample of firms that belong to risky sectors, with the interactive coefficient (δ in Equation 3) being large and statistically significant at the 1% confidence level. These results become even stronger if we drop state-owned firms from the sample (Table A6 in the appendix). Things are different in the subsample of firms that do not belong to risky sectors. In this case, δ is much smaller and only marginally significant (at the 10% confidence level) in the model without year fixed effects (columns 7 and 8 of Table 10).

In our second approach we use the full dataset and include a full set of interactions differentiating issuers from non-issuers operating in risky and non-risky sectors, before and after the policy. Figure 5, based on column 1 of Table 11, shows graphically the strong effect of the policy. The results reported in columns 2 and 3 (for the full sample) and 4 and 5 (for a sample that excludes state-owned firms) of Table 11 confirm our previous results: *the policy greatly increased the correlation between dollar issuance and interfirm lending for firms that operate in risky sectors*, and this is especially the case for non-state-owned firms.

6 Conclusions

The aftermath of the global financial crisis was characterized by a massive increase in international bond issuances by emerging market nationals. NFCs played an important role, and Chinese issuers account for nearly one-third of outstanding international bonds issued by EM nationals and nearly one-fourth of international bond issuances by EM NFCs.

This paper manually matches bond-level and firm-level data and uses them to analyze the main patterns of international bond issuances by Chinese NFCs. We show that dollar bond issuance is positively correlated with firm size and leverage and that firms that belong to risky economic sectors are more likely to issue dollar bonds. Exporters, despite their natural hedge against currency fluctuations, are less likely to issue dollar-denominated bonds. We also find that dollar issuances are positively correlated with the differential between domestic and foreign interest rates. This interest rate differential increases the likelihood of dollar bond issuance by risky firms.

These results are not in line with the hypothesis that firms choose their liability structure to jointly minimize funding cost and currency risk. Instead, safe and profitable firms with good investment projects do not borrow much abroad, and when they do so, they use the funds to finance investment projects. Riskier firms, however, engage in a specific form of shadow banking. They borrow abroad to lend at home to other NFCs. This carry trade is encouraged by the large interest rate differential between the home shadow lending rate (well above the controlled rate) and the foreign borrowing rate. This behavior is most pronounced for firms in risky sectors with limited investment opportunities and low profitability, which also became subject to regulation restricting them from borrowing at home.

In 2009-10, regulators restricted access to domestic credit for firms in risky sectors. Regulatory arbitrage then led to a major expansion of shadow banking, especially in the form of entrusted loans. We use a novel data base on interfirm entrusted loans to examine the effects

of the policy. We find that it greatly increased the correlation between dollar issuance and interfirm lending for firms that operate in risky sectors.

In China, riskier firms have engaged in a specific form of shadow banking. They have tried to boost profitability with a novel form of carry trade. Their speculative activities mimic the behavior of financial institutions while escaping the various types of prudential regulation that limit risk taking in highly leveraged financial firms.

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Table 1: The drivers of US dollar bond issuance

This table contains a set of OLS firm-level regressions where the dependent variable is a dummy variable that takes value 1 in years when a firm issues a dollar bond and the controls are the lagged values of return on assets (ROA), leverage, firm size (measured as the log of total assets), share of exports over total revenues (For. Exp.), a dummy variable that takes value 1 for firms that belong to risk sectors, the Bloomberg carry trade index (CT) and the Wenzhou shadow rate index (SR). These two indexes are not lagged. Coefficients and standard errors are multiplied by 100 to improve readability.

	(1)	(2)	(3)	(4)	(5)	(6)
ROA	3.123***	2.971***	2.643***	2.843***	-0.507	1.221
	(0.485)	(0.477)	(0.483)	(0.505)	(1.219)	(1.145)
Leverage	0.668***	0.560***	0.143	0.207	0.930	1.388*
	(0.196)	(0.184)	(0.176)	(0.179)	(0.570)	(0.664)
Size	0.678***	0.699***	0.697***	0.721***	0.109	0.033
	(0.076)	(0.078)	(0.078)	(0.080)	(0.225)	(0.232)
For. Exp.	-0.175*	-0.157*	-0.147	-0.154	-0.261	-0.359*
	(0.095)	(0.096)	(0.096)	(0.097)	(0.189)	(0.172)
Risky Sector	0.401***	0.385***	0.420***	0.402***		
	(0.135)	(0.135)	(0.141)	(0.141)		
CT	0.018***		-1.102***			
	(0.004)		(0.171)			
SR		0.026*		-3.020***		
		(0.013)		(0.493)		
ROA*CT			0.122***		0.198***	
			(0.041)		(0.057)	
Leverage*CT			0.038*		0.037	
			(0.020)		(0.025)	
Ln(Asset)*CT			0.051***		0.055***	
			(0.008)		(0.012)	
Foreign Exposure*CT			-0.002		-0.012	
			(0.010)		(0.012)	
Risky*CT			0.026*		0.033*	
			(0.014)		(0.016)	
ROA*SR				0.453***		1.334**
				(0.168)		(0.448)
Leverage*SR				-0.055		-0.101
				(0.058)		(0.121)
Ln(Asset)*SR				0.143***		0.161
				(0.024)		(0.089)
Foreign Exposure*SR				-0.059*		-0.081*
				(0.031)		(0.041)
Risky*SR				0.100**		0.130*
				(0.045)		(0.059)
Constant	-14.54***	-14.94***	-14.81***	-15.31***		
	(1.631)	(1.667)	(1.651)	(1.707)		
Firm FE	No	No	No	No	Yes	Yes
Year FE	No	No	No	No	Yes	Yes
Observations	19,991	19,991	19,991	19,991	19,989	19,989

Robust standard errors clustered at the firm and year level in parentheses

*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 2: Investment in fixed assets and dollar bond issuances

This table reports the results of a set of fixed effects regressions in which the dependent variable is capital expenditure over revenues and the explanatory variables are dollar bond issuer status (columns 1 and 2 use a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 4 use the dollar value of bond issuances over revenues, and columns 5 and 6 use the dollar value of outstanding bonds over revenues), leverage, returns on assets, firm size (log of total assets), other sources of funds, and the interaction between the Bloomberg carry trade index (CT) and issuer status.

	(1)	(2)	(3)	(4)	(5)	(6)
Issuer	-1.109*	-1.333*	-0.694	-2.068	-0.064	0.595
	(0.590)	(0.629)	(0.470)	(1.601)	(0.407)	(0.733)
Issuer*CT		0.047		-0.085		0.053
		(0.049)		(0.116)		(0.056)
Leverage	-7.192***	-7.193***	-7.212***	-7.204***	-7.213***	-7.219***
	(1.160)	(1.160)	(1.157)	(1.157)	(1.158)	(1.159)
ROA	8.022*	8.018*	8.027*	8.027*	8.029*	8.026*
	(4.101)	(4.102)	(4.103)	(4.103)	(4.102)	(4.103)
Size	1.386**	1.386**	1.387**	1.388**	1.388**	1.386**
	(0.476)	(0.476)	(0.477)	(0.477)	(0.477)	(0.477)
Other Sources	-0.123**	-0.123**	-0.124**	-0.123	-0.127**	-0.127
	(0.054)	(0.053)	(0.053)	(0.074)	(0.052)	(0.071)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,742	18,742	18,742	18,742	18,742	18,742
Issuer is:	Dummy	Dummy	Amount Issuance	Amount Issuance	Amount Outstanding	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses
*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 3: Cash holdings and dollar bond issuances

This table reports the results of a set of fixed effects regressions in which the dependent variable is liquid financial assets over revenues and the explanatory variables are dollar bond issuer status (columns 1 and 2 use a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 4 use the dollar value of bond issuances over revenues, and columns 5 and 6 use the dollar value of outstanding bonds over revenues), leverage, returns on assets, firm size (log of total assets), other sources of funds, and the interaction between the Bloomberg carry trade index (CT) and issuer status.

	(1)	(2)	(3)	(4)	(5)	(6)
Issuer	-0.335	-0.840	-1.519	-9.297	-1.923	-4.944
	(3.182)	(3.622)	(2.014)	(6.938)	(2.347)	(3.287)
Issuer*CT		0.106		-0.481		-0.241**
		(0.249)		(0.289)		(0.086)
Leverage	-32.685***	-32.689***	-32.687***	-32.647***	-32.682***	-32.658***
	(7.188)	(7.194)	(7.221)	(7.215)	(7.215)	(7.209)
ROA	10.947	10.940	10.945	10.941	10.948	10.957
	(16.973)	(16.979)	(16.970)	(16.970)	(16.965)	(16.968)
Size	-0.169	-0.169	-0.171	-0.164	-0.169	-0.161
	(1.716)	(1.717)	(1.716)	(1.716)	(1.717)	(1.718)
Other Sources	0.035	0.036	0.040	0.043	0.044	0.045
	(0.098)	(0.097)	(0.107)	(0.122)	(0.115)	(0.128)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,653	18,653	18,653	18,653	18,653	18,653
Issuer is:	Dummy	Dummy	Amount Issuance	Amount Issuance	Amount Outstanding	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses
*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 4: Inter-firm loans holdings and dollar bond issuances

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (columns 1 and 2 us a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 4 use the dollar value of bond issuances over revenues, and columns 5 and 6 use the dollar value of outstanding bonds over revenues), leverage, returns on assets, firm size (log of total assets), other sources of funds, and the interaction between the Bloomberg carry trade index (CT) and issuer status. The last three columns estimate the models of columns 2, 4, and 6 using the Wenzhou shadow rate index (SR) instead of the Carry Trade index.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Issuer	2.952	1.650	2.144***	0.960	1.861***	0.671	1.859	1.568***	1.353***
	(2.284)	(1.935)	(0.469)	(0.679)	(0.529)	(0.639)	(2.697)	(0.404)	(0.389)
Issuer*CT		0.263		0.131**		0.137**			
		(0.163)		(0.048)		(0.042)			
Issuer*SR							1.144	0.945***	0.854***
							(0.940)	(0.269)	(0.166)
Leverage	1.902	1.892	1.887	1.875	1.901	1.889	1.897	1.282	1.299
	(1.204)	(1.205)	(1.195)	(1.198)	(1.195)	(1.198)	(1.206)	(1.115)	(1.115)
ROA	-29.268***	-29.291***	-29.325***	-29.343***	-29.324***	-29.342***	-29.273***	-22.844***	-22.843***
	(6.897)	(6.897)	(6.907)	(6.901)	(6.905)	(6.899)	(6.896)	(4.794)	(4.793)
Size	-0.697	-0.697	-0.726	-0.736	-0.724	-0.734	-0.699	-0.885*	-0.881*
	(0.463)	(0.463)	(0.473)	(0.473)	(0.472)	(0.472)	(0.463)	(0.427)	(0.426)
Other Sources	0.138	0.137	0.056	0.056	0.082	0.082	0.140	0.030	0.056
	(0.136)	(0.133)	(0.046)	(0.046)	(0.071)	(0.071)	(0.137)	(0.036)	(0.057)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	19,422	19,422	19,422	19,422	19,422	19,422	19,422	18,179	18,179
Issuer is:	Dummy	Dummy	Amount Issuance	Amount Issuance	Amount Outstanding	Amount Outstanding	Dummy	Amount Issuance	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses
*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 5: Inter-firm loans and dollar and RMB bond issuances

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (Issuer USD columns 1 and 2 use a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 4 use the value of bond issuances over revenues, and columns 5 and 6 use the value of outstanding bonds over revenues), RMB bond issuer status (Issuer RMB columns 1 and 2 use a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 4 use the value of bond issuances over revenues, and columns 5 and 6 use the value of outstanding bonds over revenues) leverage, returns on assets, firm size (log of total assets), other sources of funds, and the interaction between the Bloomberg carry trade index (CT) and issuer status.

	(1)	(2)	(3)	(4)	(5)	(6)
Issuer USD	2.854	1.502	2.200***	0.923	1.848***	0.556
	(2.289)	(1.909)	(0.492)	(0.720)	(0.529)	(0.633)
Issuer RMB	0.611*	0.564	0.333*	0.190	0.011***	-0.022
	(0.308)	(0.300)	(0.177)	(0.130)	(0.003)	(0.024)
Issuer USD*CT		0.254		0.128**		0.136**
		(0.162)		(0.049)		(0.043)
Issuer RMB*CT		0.020		0.019		0.003
		(0.020)		(0.012)		(0.002)
Leverage	1.815	1.795	1.887	1.865	1.899	1.884
	(1.212)	(1.214)	(1.196)	(1.195)	(1.195)	(1.197)
ROA	-29.300***	-29.339***	-29.326***	-29.359***	-29.332***	-29.354***
	(6.903)	(6.905)	(6.910)	(6.909)	(6.906)	(6.901)
Size	-0.713	-0.712	-0.726	-0.735	-0.723	-0.733
	(0.464)	(0.465)	(0.473)	(0.472)	(0.472)	(0.472)
Other Sources	0.117	0.117	-0.034	0.047	0.060	0.151
	(0.129)	(0.125)	(0.053)	(0.081)	(0.064)	(0.117)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,422	19,422	19,422	19,422	19,422	19,422
Issuer is:	Dummy	Dummy	Amount Issuance	Amount Issuance	Amount Outstanding	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses
*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 6: Inter-firm loan holdings and bond issuances: intensive versus extensive margin

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (Issuer dummy is a dummy variable that takes value one if the firm has issued in a given year), amount issued (in columns 1 and 2 Issuer amount is the dollar value of bond issuances over revenues and in columns 3 and 4 use Issuer amount as the dollar value of outstanding bonds over revenues), leverage, returns on assets, firm size (log of total assets), other sources of funds, and the interaction between the Bloomberg carry trade index (CT) and issuer status and amount.

	(1)	(2)	(3)	(4)
Issuer Dummy	1.451	0.252	1.769	2.085
	(1.995)	(1.951)	(2.301)	(1.439)
Issuer Dummy * CT		0.238		0.057
		(0.182)		(0.155)
Issuer amount	2.052***	1.446***	1.730**	0.484
	(0.406)	(0.403)	(0.543)	(0.643)
Issuer amount * CT		0.061**		0.139***
		(0.023)		(0.043)
Leverage	1.862	1.850	1.871	1.846
	(1.191)	(1.193)	(1.191)	(1.196)
ROA	-29.319***	-29.346***	-29.316***	-29.336***
	(6.901)	(6.902)	(6.899)	(6.891)
Size	-0.723	-0.724	-0.720	-0.729
	(0.473)	(0.472)	(0.472)	(0.471)
Other Sources	0.053	0.062	0.079	0.077
	(0.042)	(0.049)	(0.066)	(0.065)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	19,422	19,422	19,422	19,422
Issuer amount is:	Issuances	Issuances	Outstanding	Outstanding

Robust standard errors clustered at the firm and year level in parentheses
*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 7: Inter-firm loans, dollar bond issuance and firm heterogeneity

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (Panel A uses a dummy variable that takes value one if the firm has issued in a given year, Panel B uses the value of bond issuances over revenues, and Panel C uses outstanding bonds over revenues), leverage, returns on assets, firm size (log of total assets), other sources of funds and the interaction between firm characteristics (return on assets, risky sector, Tobin's Q, state-owned firm, bond maturity) and Issuer.

	(1)	(2)	(3)	(4)	(5)
			A. Issuers versus non issuers		
Issuer Dummy	6.011	0.799	0.742	5.079	4.779
	(4.634)	(1.217)	(1.214)	(3.960)	(2.958)
Iss x INT	-100.9	3.334	0.526*	-6.499**	-4.423
	(89.955)	(2.728)	(0.272)	(2.771)	(4.058)
Leverage	1.883	1.906	-1.039	1.906	1.907
	(1.204)	(1.205)	(2.304)	(1.204)	(1.203)
ROA	-29.2***	-29.3***	-33.0**	-29.3***	-29.3***
	(6.895)	(6.89)	(12.19)	(6.90)	(6.90)
Size	-0.692	-0.693	-0.432	-0.703	-0.704
	(0.462)	(0.462)	(0.814)	(0.463)	(0.464)
Other Sources	0.137	0.138	0.118	0.138	0.133
	(0.133)	(0.135)	(0.130)	(0.137)	(0.129)
Tobin's Q			0.100		
			(0.070)		
			B. Bond issuances		
Bond Issuance	3.799***	0.173	1.986***	3.832**	2.157***
	(0.674)	(0.263)	(0.346)	(1.349)	(0.456)
Iss x INT	-123.1***	2.08***	0.105***	-33.6***	-2.008
	(30.367)	(0.300)	(0.016)	(7.452)	(1.210)
Leverage	1.872	1.888	-1.257	1.890	1.906
	(1.199)	(1.196)	(2.271)	(1.195)	(1.198)
ROA	-29.3***	-29.3***	-33.2**	-29.3***	-29.3***
	(6.90)	(6.90)	(12.2)	(6.908)	(6.910)
Size	-0.739	-0.727	-0.404	-0.719	-0.726
	(0.473)	(0.473)	(0.815)	(0.471)	(0.473)
Other Sources	0.056	0.056	0.023	0.052	0.059
	(0.046)	(0.046)	(0.019)	(0.040)	(0.048)
			0.110		
			(0.068)		
			C. Outstanding bonds		
Outstanding	3.728***	0.104	1.673***	3.228	1.945***
	(0.658)	(0.094)	(0.417)	(4.081)	(0.491)
Iss x INT	-130.0***	1.88***	0.347	-11.1***	-1.470
	(31.873)	(0.503)	(0.203)	(1.679)	(3.968)
Leverage	1.887	1.900	-1.228	1.899	1.917
	(1.199)	(1.196)	(2.266)	(1.193)	(1.199)
ROA	-29.3***	-29.3***	-33.2**	-29.3***	-29.3***
	(6.902)	(6.900)	(12.194)	(6.905)	(6.906)
Size	-0.736	-0.726	-0.420	-0.722	-0.724
	(0.473)	(0.472)	(0.811)	(0.472)	(0.472)
Other Sources	0.082	0.081	0.037	0.079	0.083
	(0.072)	(0.071)	(0.031)	(0.064)	(0.072)
			0.109		
			(0.067)		
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
N. Obs	19,422	19,422	6,326	19,422	19,422
INT is	ROA	Risky	Tobin's Q	SOE	LT Bond

Robust standard errors clustered at the firm and year level in parentheses; *** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 8: Entrusted loans

This table shows the share of entrusted loans for which the lender and the borrower belong to the same industry or are located in the same city. The first column uses data for all entrusted loans and the third column only uses data for entrusted loans in which the lender belongs to a risky sector. The second and fourth columns shows the share of same industry and same city province pairs that would be obtained if lenders and borrowers in the dataset were randomly matched with 95% confidence interval in brackets. The random matching is based on Monte Carlo simulations with 1000 draws. The last two columns only include data for unaffiliated firms

	All entrusted loans		**Entrusted loans for which the lender belongs to a risky sector**		**Unaffiliated pairs**	
	Data	Random match	Data	Random match	All	Risky
Same Industry	24.8%	4.1% [3.1%-5.1%]	43.0%	11.9% [8.5%-15.4%]	20.9%	39.2%
Same city	39.5%	2.3% [1.7%-2.9%]	41.8%	2.5% [1.1%-3.9%]	41.0%	39.6%

Table 9: Entrusted loans characteristics

This table presents a set of regressions using data on entrusted loans. The dependent variables are: the log of the amount of the loan (columns 1 and 5), loan maturity in months (columns 2 and 6), a dummy variable that takes value one if the loan is collateralized (columns 3 and 7), the loan's interest rate (columns 4 and 8). The controls are the size of the borrower (log of total assets), the borrower's profitability (profits over total assets), and a set of dummies taking value one if (i) the borrower and the lender belong to the same industry; (ii) the borrower and the lender are located in the same city; (iii) the borrower belongs to a risky industry; (iv) the borrower and the lender are affiliates.

	(1) Ln(Amount)	(2) Maturity	(3) Collateral	(4) Interest rate	(5) Ln(Amount)	(6) Maturity	(7) Collateral	(8) Interest rate
Same industry	0.265***	0.076	-0.202***	-1.165***	-0.018	-0.272	-0.211***	-1.401***
	(0.090)	(0.775)	(0.029)	(0.131)	(0.097)	(1.268)	(0.044)	(0.224)
Same city	0.221***	-1.014*	-0.035	-0.255	0.063	-0.688	0.064*	0.681
	(0.073)	(0.589)	(0.027)	(0.185)	(0.079)	(0.837)	(0.038)	(0.563)
Risky borrower	0.413***	-1.849***	0.036	1.259***	0.064	-1.726	0.116**	1.407***
	(0.072)	(0.642)	(0.029)	(0.213)	(0.089)	(1.162)	(0.046)	(0.328)
Affiliated	-0.251***	3.182***	-0.091***	-0.540***	-0.205**	3.721**	-0.009	-0.976***
	(0.083)	(0.795)	(0.029)	(0.204)	(0.102)	(1.699)	(0.048)	(0.264)
Borrower size					0.352***	-0.624**	-0.006	0.038
					(0.029)	(0.265)	(0.012)	(0.079)
Borrower profitability					-0.503***	0.901*	0.030	0.110
					(0.042)	(0.465)	(0.025)	(0.135)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,297	1,291	1,297	1,295	632	631	632	632

Robust standard errors in parentheses; *** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table 10: Inter-firm loans as regulatory arbitrage

This table shows the results of a set of firm-level regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar issuer status (Issuer), a dummy taking value one after 2009 (Policy), the interaction between Issuer and Policy, the interaction between Issuer and a risky industry dummy, firm leverage, returns on assets and size (measured as log of total assets). Columns 1-4 include all firm-year, columns 5 and 6 include only firms that belong to risky sectors, columns 7 and 8 include only firms that do not belong to risky sectors.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Issuer	-9.027	-9.225			-16.518***	-17.749***	-1.725**	-0.982***
	(5.237)	(5.839)			(2.612)	(2.521)	(0.594)	(0.215)
Policy	-1.361*		-1.246		-1.130		-1.525*	
	(0.731)		(0.722)		(0.957)		(0.775)	
Issuer x Policy	12.913**	12.807**			21.759***	22.253***	2.753*	1.894
	(5.047)	(5.621)			(2.690)	(2.476)	(1.278)	(1.087)
Risky x Policy			-0.358	-0.249				
			(0.568)	(0.575)				
Leverage	1.581	1.732	1.716	1.843	-0.129	0.042	2.369*	2.533*
	(1.092)	(1.138)	(1.084)	(1.130)	(2.536)	(2.572)	(1.145)	(1.246)
ROA	-31.371***	-29.035***	-31.329***	-28.996***	-43.170***	-40.621***	-26.615***	-24.344***
	(7.285)	(6.702)	(7.291)	(6.712)	(12.172)	(12.341)	(6.213)	(5.591)
Size	-0.610	-0.663	-0.596	-0.662	-1.344*	-1.527*	-0.149	-0.091
	(0.337)	(0.449)	(0.336)	(0.450)	(0.598)	(0.710)	(0.355)	(0.535)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,989	19,989	19,989	19,989	4,919	4,919	15,070	15,070
Sample	All	All	All	All	Risky	Risky	Non-Risky	Non-Risky

Robust standard errors clustered at the firm and year level in parentheses, p-values in brackets; *** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

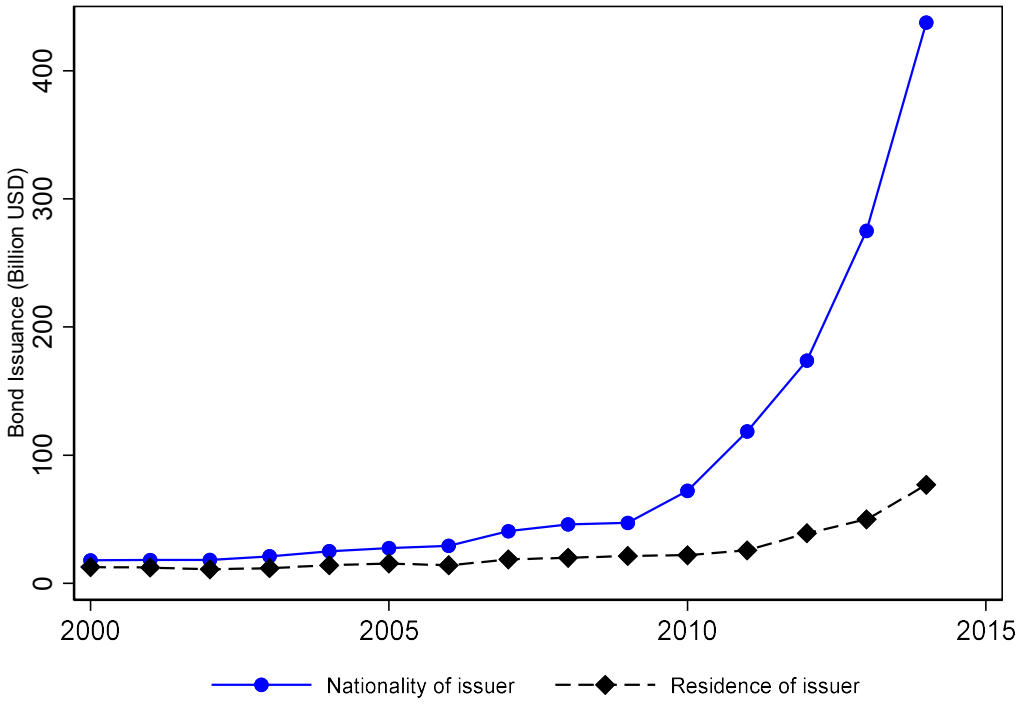
Table 11: Inter-firm loans as regulatory arbitrage, full set of interactions

This table shows the results of a set of firm-level regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar issuer status (Issuer), a dummy taking value one after 2009 (Policy), a risky industry dummy, the interaction between Issuer and Policy, the interaction between Issuer and a risky industry dummy, the triple interaction among these variables, firm leverage, returns on assets and size (measured as log of total assets). 1 and 3 include all firm-year, columns 4 and 5 only include firms that belong to risky sectors, columns, 7 and 8 only includes firms that do not belong to risky sectors, and columns 4 and 5 do not include state-owned firms. The bottom panel reports statistics for the sum of coefficients. Column 1 does not control for firm and year fixed effects.

	(1)	(2)	(3)	(4)	(5)
Issuer	-5.603***	-1.587*	-0.998**	-1.428	-0.764
	(0.194)	(0.851)	(0.380)	(0.836)	(0.524)
Risky	2.202***				
	(0.441)				
Policy	-1.160***	-1.247		-1.114	
	(0.202)	(0.731)		(0.747)	
Issuer x Policy	11.853**	2.855	2.095	3.162	2.356
	(3.762)	(1.558)	(1.407)	(1.834)	(1.696)
Risky x Policy	-0.069	-0.433	-0.320	-0.403	-0.288
	(0.449)	(0.568)	(0.575)	(0.620)	(0.624)
Issuer x Risky	-0.763	-14.397***	-15.984***	-13.194***	-15.002***
	(0.491)	(3.675)	(2.889)	(3.989)	(3.137)
Issuer x Risky x Policy	4.296***	18.395***	19.739***	19.793***	21.271***
	(0.925)	(3.357)	(2.452)	(3.625)	(2.684)
Leverage	2.881***	1.649	1.782	1.034	1.139
	(0.545)	(1.092)	(1.133)	(1.159)	(1.217)
ROA	-41.239***	-31.276***	-28.962***	-29.897***	-27.423***
	(1.956)	(7.272)	(6.698)	(7.496)	(6.927)
Size	-1.109***	-0.602	-0.658	-0.618	-0.754
	(0.079)	(0.335)	(0.448)	(0.381)	(0.505)
Year FE	No	No	Yes	No	Yes
Firm FE	No	Yes	Yes	Yes	Yes
Observations	19,989	19,989	19,989	16,600	16,600
Sample		All	All	Excluding SOE	
Non-risky issuer after Policy		0.03	1.10	0.62	1.59
		[0.98]	[0.21]	[0.57]	[0.14]
Risky non-issuer after Policy		-1.68***		-1.52***	
		[0.00]		[0.00]	
Risky issuer		-15.98***	-16.98***	-14.62***	-15.77***
		[0.00]	[0.00]	[0.00]	[0.00]
Risky issuer after Policy		3.59**	4.53**	6.82***	7.57**
		[0.03]	[0.05]	[0.01]	[0.02]

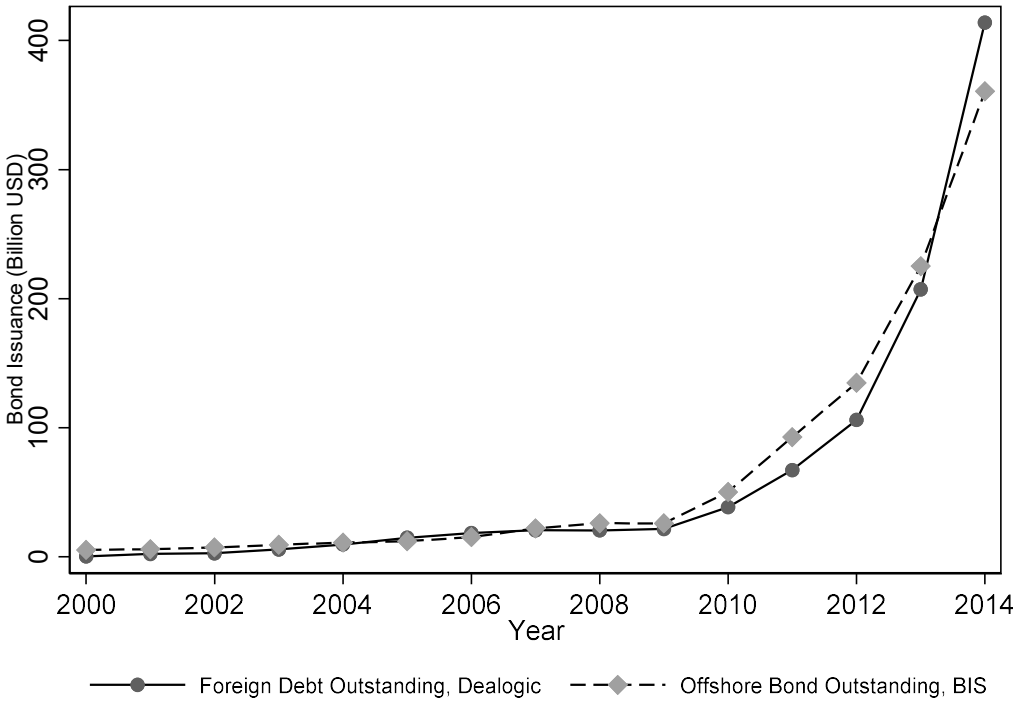
Robust standard errors clustered at the firm and year level in parentheses, p-values in brackets; *** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Figure 1: International bonds by Chinese Residents and Chinese Nationals



Source: Own elaborations based on BIS data

Figure 2: Dealogic versus BIS data



Source: Own elaborations based on BIS and Dealogic data

Figure 3: Year fixed effects and returns from carry trade

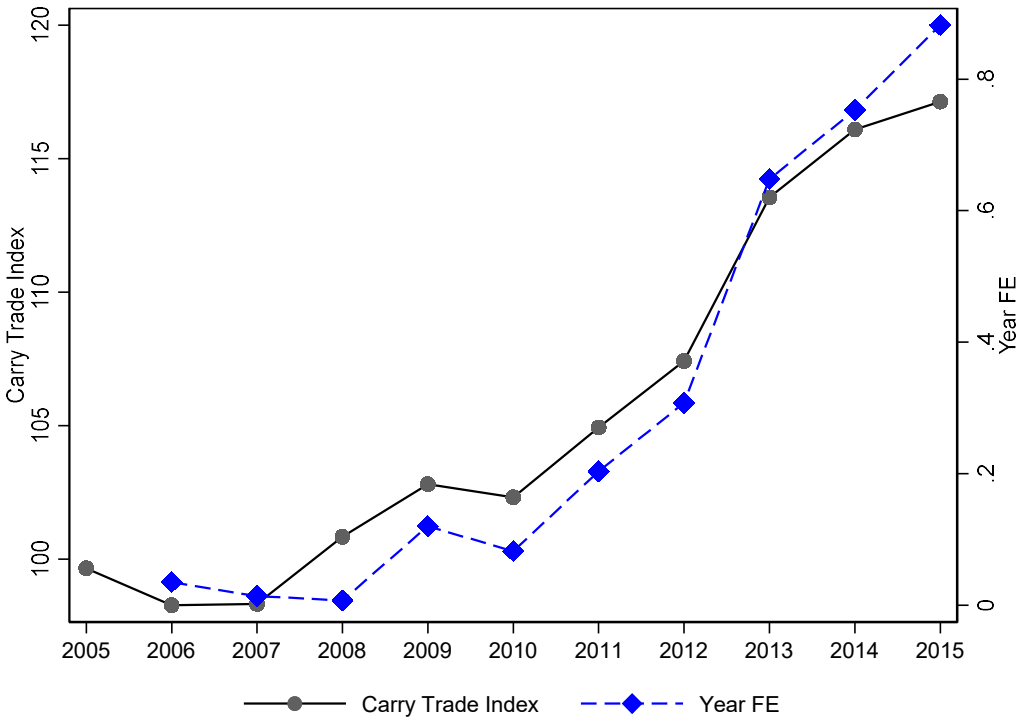


Figure 4: Official and Shadow Interest Rates in China

The solid gray line plots the interest rate on 12-month deposits, the dashed gray line plots the interest rate on 12-month loans and the black solid line plots the spread between the Wenzhou composite rate and the 12-month deposit rate.

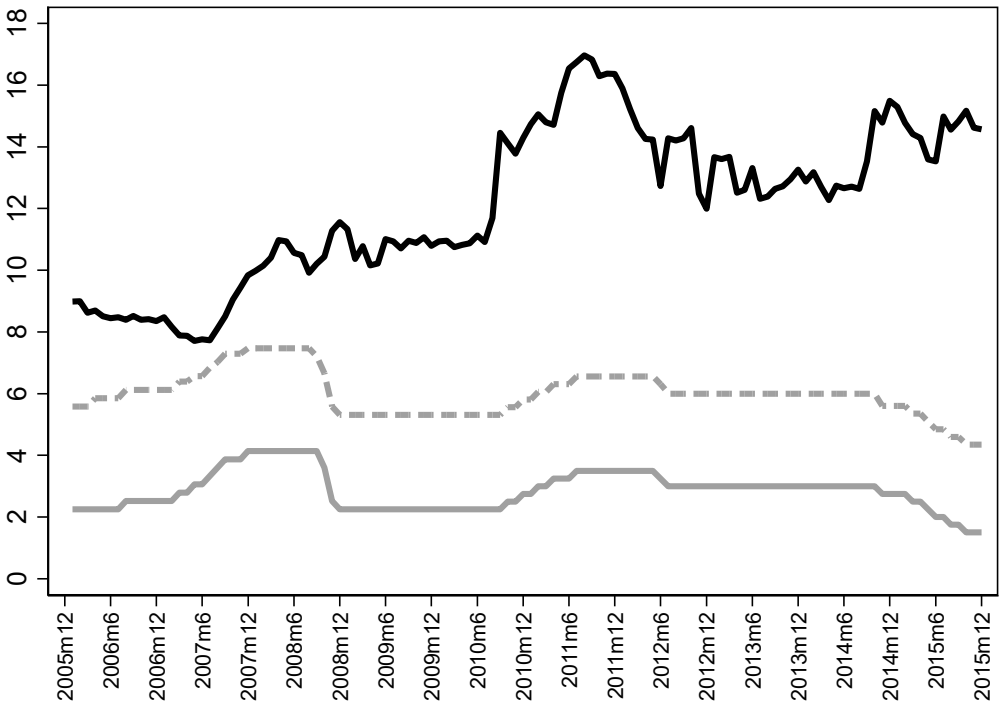
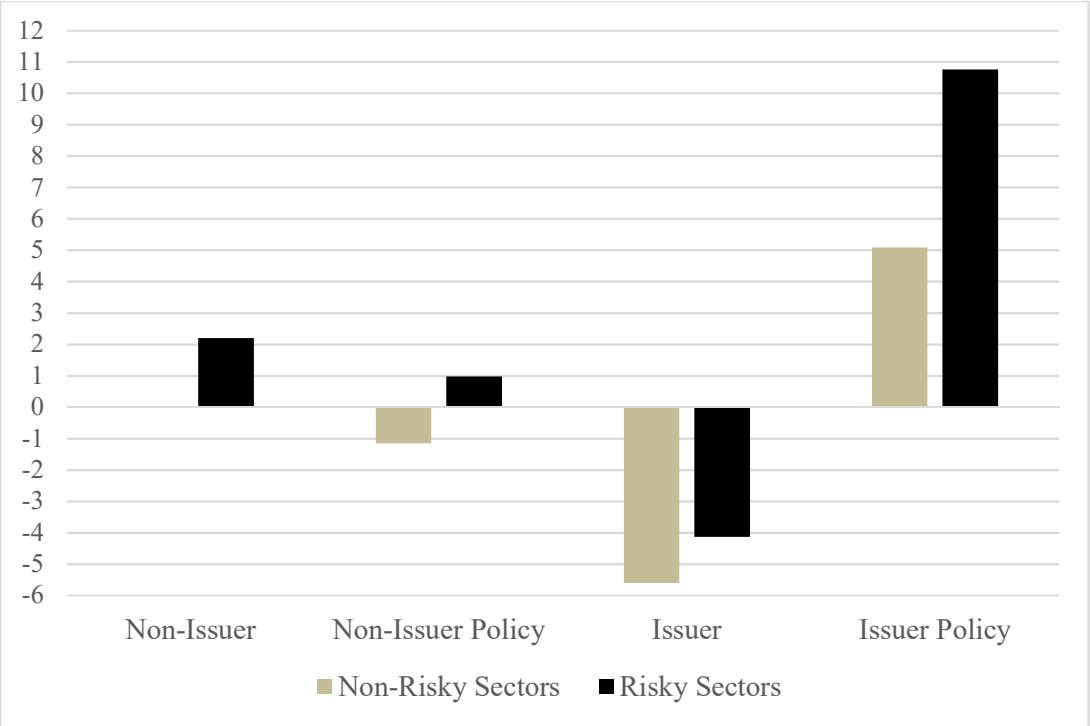


Figure 5: Interfirm loans for issuers and non-issuers before and after the introduction of regulatory policies

This figure is based on column one of Table 11 and plots the deviation of interfirm loans with respect to interfirm loans of firms that do not belong to risky sectors and did not issue dollar bonds in the period before the introduction of the regulatory policies (this is the excluded group).



Appendix

Table A1: Data sources

Variable	Description	Source
Issuer USD	Variable for firms that issue dollar bonds. In can be express as (i) a dummy (taking value one for firm-years with a USD bond issuance); (ii) the amount issued in a given year scaled by firm revenues; (iii) the stock of outstanding bonds scaled by firm revenues.	Dealogic
Issuer RMB	Variable for firms that issue RMB bonds. In can be express as (i) a dummy (taking value one for firm-years with a RMB bond issuance); (ii) the amount issued in a given year scaled by firm revenues; (iii) the stock of outstanding bonds scaled by firm revenues.	Dealogic
Cash holdings	Firm holdings of cash and other liquid assets scaled by revenues.	CSMAR
Investment in fixed assets	Firm investment in fixed assets scaled by revenues.	CSMAR
Interfirm loans	Interfirm loans defined as "other receivables" scaled by revenues.	CSMAR
ROA	Return on assets	CSMAR
Leverage	Debt over assets	CSMAR
Asset (or size)	Log of total assets	CSMAR
Foreign Exposure	Foreign exposure is defined as the share of exports over total revenues	CSMAR
Other Sources	Other sources of funds defined as the other sources of working capital	CSMAR
Risky Sector	Dummy that takes value one for sectors coded as (i) over-capacity sectors; (ii) real estate sector; and (ii) other risky sectors	Chen et al. (2018)
Carry trade index (CT)	Bloomberg carry trade index	Bloomberg
Shadow rate (SR)	Wenzhou shadow lending rate	Wind Information Co. (WIND)
Entrusted loan amount	Log Amount (in RMB) of a given entrusted loan	Hand-collected data from entrusted loan raw announcements
Entrusted loan maturity	Maturity (in months) of a given entrusted loan	As above
Entrusted loan collateral	Dummy variable that takes value one if a given entrusted loan is collateralized	As above
Entrusted loans interest rate	Interest rate on entrusted loan	As above
Same industry	Dummy variable that takes value one if the borrower and lender of the entrusted loan belong to the same industry	As above
Same city	Dummy variable that takes value one if the borrower and lender of the entrusted loan are located in the same city	As above
Affiliated	Dummy variable that takes value one if the borrower and lender of the entrusted loan are affiliates	As above
Borrower size	Log assets of the entrusted loan borrower	As above
Borrower profitability	Profits over asset of the entrusted loan borrower	As above

Table A2: Sector classification

SIC	Sector (0=non risky, 1=overcapacity, 2=real estate, 3=other risky)
Aluminum extruded products	1
Aluminum rolling and drawing, NEC	1
Aluminum sheet, plate, and foil	1
Anthracite mining	1
Bituminous coal and lignite--surface	1
Bituminous coal--underground	1
Blast furnaces and steel mills	1
Bridge, tunnel, and elevated highway	3
Cellulosic manmade fibers	3
Cement, hydraulic	1
Coal and other minerals and ores	1
Coal mining services	1
Cold finishing of steel shapes	1
Concrete block and brick	1
Concrete products	1
Converted paper products, NEC	3
Copper ores	3
Copper rolling and drawing	3
Flat glass	1
Glass and glazing work	1
Gray and ductile iron foundries	1
Heavy construction, NEC	2
Iron ores	3
Lead and zinc ores	3
Nonresidential building operators	2
Nonresidential construction	2
Organic fibers, noncellulosic	3
Paper mills	3
Petroleum and coal products, NEC	1
Primary aluminum	1
Primary copper	3
Ready-mixed concrete	1
Real estate agents and managers	2
Real estate investment trusts	2
Real property lessors, NEC	2
Residential construction	2
Ship building and repairing	1
Single-family housing construction	2
Soybean oil mills	1
Steel foundries, NEC	1
Steel pipe and tubes	1
Steel wire and related products	1

We code risky sectors using Chen et al.'s (2018) classification of China's economic sectors into: (i) non-risky sectors; (ii) over-capacity sectors; (iii) real estate sector; and (iv) other risky sectors. We use information from the WIND database to code sectors that belong to the last three groups as risky. Chen et al. (2018) classification is, in turn, based on the definition of the Ministry of Industry and Information Technology of the People's Republic of China which in 2014 labeled 15 industries as over-capacity industries.

Table A3: The drivers of US dollar bond issuance

This table contains a set of OLS firm-level regressions where the dependent variable the ln(1+ dollar bond issuances) and the controls are the lagged values of return on assets (ROA), leverage, firm size (measured as the log of total assets), share of exports over total revenues (For. Exp.), a dummy variable that takes value 1 for firms that belong to risk sectors, the Bloomberg carry trade index (CT) and the Wenzhou shadow rate index (SR). These two indexes are not lagged. Coefficients and standard errors are multiplied by 100 to improve readability.

	(1)	(2)	(3)	(4)	(5)	(6)
ROA	0.622***	0.594***	0.521***	0.576***	-0.365	0.018
	(0.105)	(0.103)	(0.104)	(0.110)	(0.284)	(0.191)
Leverage	0.111***	0.085**	0.001	0.019	0.113	0.225*
	(0.040)	(0.037)	(0.036)	(0.037)	(0.098)	(0.117)
Size	0.132***	0.137***	0.136***	0.142***	-0.034	-0.051
	(0.016)	(0.017)	(0.017)	(0.017)	(0.044)	(0.044)
For. Exp.	-0.044**	-0.040**	-0.038*	-0.039*	-0.034	-0.056*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.032)	(0.029)
Risky Sector	0.112***	0.109***	0.117***	0.113***		
	(0.028)	(0.028)	(0.030)	(0.029)		
CT	0.004***		-0.228***			
	(0.001)		(0.037)			
SR		0.003		-0.565***		
		(0.003)		(0.101)		
ROA*CT			0.025***		0.049***	
			(0.009)		(0.013)	
Leverage*CT			0.007*		0.009*	
			(0.004)		(0.004)	
Ln(Asset)*CT			0.011***		0.012***	
			(0.002)		(0.003)	
Foreign Exposure*CT			-0.000		-0.002	
			(0.002)		(0.003)	
Risky*CT			0.007**		0.009*	
			(0.003)		(0.004)	
ROA*SR				0.089**		0.314**
				(0.036)		(0.116)
Leverage*SR				-0.021*		-0.021
				(0.012)		(0.028)
Ln(Asset)*SR				0.027***		0.031
				(0.005)		(0.020)
Foreign Exposure*SR				-0.012**		-0.019*
				(0.006)		(0.009)
Risky*SR				0.026***		0.034**
				(0.009)		(0.015)
Constant	-2.838***	-2.931***	-2.896***	-3.010***	0.825	1.145
	(0.349)	(0.358)	(0.355)	(0.368)	(0.972)	(0.931)
Firm FE	No	No	No	No	Yes	Yes
Year FE	No	No	No	No	Yes	Yes
Observations	19,991	19,991	19,991	19,991	19,989	19,989

Robust standard errors clustered at the firm and year level in parentheses

*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table A4: Inter-firm loans holdings and dollar bond issuances, excluding State-Owned Firms

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (columns 1 and 2 us a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 4 use the dollar value of bond issuances over revenues, and columns 5 and 6 use the dollar value of outstanding bonds over revenues), leverage, returns on assets, firm size (log of total assets), other sources of funds, and the interaction between the Bloomberg carry trade index (CT) and issuer status. The last three columns estimate the models of columns 2, 4, and 6 using the Wenzhou shadow rate index (SR) instead of the Carry Trade index. The sample does not include state-owned firms.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Issuer	4.803	3.027	2.212***	1.016	2.003***	0.783	3.592	1.610***	1.459***
	(2.920)	(2.338)	(0.416)	(0.656)	(0.488)	(0.594)	(3.340)	(0.382)	(0.355)
Issuer*CT		0.416*		0.132**		0.141**			
		(0.194)		(0.051)		(0.045)			
Issuer*SR							1.249	0.956***	0.877***
							(1.116)	(0.283)	(0.179)
Leverage	1.217	1.199	1.204	1.188	1.222	1.205	1.210	0.470	0.491
	(1.310)	(1.313)	(1.298)	(1.304)	(1.299)	(1.305)	(1.314)	(1.129)	(1.131)
ROA	-27.761***	-27.781***	-27.802***	-27.826***	-27.803***	-27.828***	-27.763***	-21.325***	-21.325***
	(7.192)	(7.188)	(7.194)	(7.187)	(7.194)	(7.186)	(7.190)	(4.966)	(4.965)
Size	-0.784	-0.784	-0.815	-0.827	-0.813	-0.825	-0.786	-1.007*	-1.003*
	(0.516)	(0.517)	(0.528)	(0.529)	(0.527)	(0.528)	(0.516)	(0.462)	(0.461)
Other Sources	0.106	0.103	0.023	0.023	0.049	0.048	0.108	0.015	0.041
	(0.116)	(0.110)	(0.044)	(0.051)	(0.069)	(0.070)	(0.117)	(0.058)	(0.071)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	16,057	16,057	16,057	16,057	16,057	16,057	16,057	15,111	15,111
Issuer is:	Dummy	Dummy	Amount Issuance	Amount Issuance	Amount Outstanding	Amount Outstanding	Dummy	Amount Issuance	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses

*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table A5: Entrusted loans characteristics

This table presents a set of regression using data on entrusted loans. The dependent variables are: the log of the amount of the loan (columns 1 and 5), loan maturity in months (columns 2 and 6), a dummy variable that takes value one if the loan is collateralized (columns 3 and 7), the loan's interest rate (columns 4 and 8). The controls are the size of the borrower (log of total assets), the borrower's profitability (profits over total assets), and a set of dummies taking value one if (i) the borrower and the lender belong to the same industry and the industry is classified as risky; (ii) the borrower and the lender belong to the same industry and the industry is not classified as risky; (iii) the borrower and the lender are located in the same city and the lender is classified as risky; (iv) the borrower and the lender are located in the same city and the lender is not classified as risky; (v) the borrower belongs to a risky industry; (vi) the borrower and the lender are affiliates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(Amount)	Maturity	Collateral	Interest rate	Ln(Amount)	Maturity	Collateral	Interest rate
Same industry risky	0.442***	-2.657**	-0.223***	-1.786***	0.202	-1.677	-0.322***	-2.259***
	(0.139)	(1.170)	(0.059)	(0.313)	(0.123)	(1.600)	(0.076)	(0.436)
Same industry non-risky	0.171	1.217	-0.212***	-0.911***	-0.164	0.362	-0.166***	-0.866***
	(0.119)	(1.018)	(0.035)	(0.146)	(0.136)	(1.718)	(0.057)	(0.219)
Same city risky	0.302***	-0.050	0.054	-0.049	0.111	0.495	0.171**	0.737*
	(0.110)	(1.047)	(0.055)	(0.326)	(0.107)	(1.389)	(0.070)	(0.423)
Same city non-risky	0.192**	-1.306**	-0.065**	-0.316	0.031	-1.223	0.019	0.650**
	(0.084)	(0.642)	(0.029)	(0.212)	(0.094)	(0.952)	(0.043)	(0.317)
Risky borrower	0.344***	-1.144	0.029	1.425***	-0.029	-1.420	0.140***	1.710***
	(0.081)	(0.761)	(0.034)	(0.264)	(0.104)	(1.355)	(0.051)	(0.389)
Affiliated	-0.253***	3.079***	-0.096***	-0.560***	-0.243**	3.626**	-0.017	-0.910***
	(0.084)	(0.798)	(0.029)	(0.205)	(0.102)	(1.673)	(0.048)	(0.269)
Borrower size					0.348***	-0.602**	-0.005	0.060
					(0.029)	(0.264)	(0.012)	(0.081)
Borrower profitability					-0.497***	0.863*	0.027	0.088
					(0.041)	(0.484)	(0.022)	(0.131)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lender Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	1,293	1,287	1,293	1,291	628	627	628	628

Robust standard errors in parentheses; *** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table A6: Inter-firm loans as regulatory arbitrage, excluding State-Owned Firms

This table shows the results of a set of firm-level regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar issuer status (Issuer) a dummy taking value one after 2009 (Policy), the interaction between Issuer and Policy, the interaction between Issuer and a risky industry dummy, the triple interaction among these variables, firm leverage, returns on assets and size (measured as log of total assets). Columns 1-4 and 9-10 include all firm-year, columns5 and 6 only include firms that belong to risky sectors, columns, 7 and 8 only includes firms that do not belong to risky sectors.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Issuer	-8.490	-8.715			-15.299***	-16.932***	-1.606**	-0.861***	-1.428	-0.764
	(5.036)	(5.731)			(3.092)	(2.835)	(0.570)	(0.059)	(0.836)	(0.524)
Policy	-1.221		-1.117		-0.694		-1.504*		-1.114	
	(0.770)		(0.743)		(1.084)		(0.777)		(0.747)	
Issuer x Policy	14.456**	14.358**			23.774***	24.455***	3.088*	2.285	3.162	2.356
	(4.820)	(5.411)			(3.255)	(2.760)	(1.621)	(1.520)	(1.834)	(1.696)
Risky x Policy			-0.307	-0.196					-0.403	-0.288
			(0.627)	(0.630)					(0.620)	(0.624)
Issuer x Risky									-13.194***	-15.002***
									(3.989)	(3.137)
Issuer x Risky x Policy									19.793***	21.271***
									(3.625)	(2.684)
Leverage	0.977	1.101	1.132	1.232	-0.147	0.124	1.719	1.830	1.034	1.139
	(1.162)	(1.222)	(1.161)	(1.221)	(2.965)	(2.968)	(1.113)	(1.265)	(1.159)	(1.217)
ROA	-30.019***	-27.516***	-29.930***	-27.437***	-42.598***	-38.834***	-24.195***	-22.010***	-29.897***	-27.423***
	(7.520)	(6.938)	(7.518)	(6.941)	(11.497)	(11.647)	(6.709)	(6.136)	(7.496)	(6.927)
Size	-0.623	-0.757	-0.602	-0.751	-1.619*	-1.972**	-0.010	0.024	-0.618	-0.754
	(0.383)	(0.505)	(0.382)	(0.506)	(0.732)	(0.853)	(0.366)	(0.569)	(0.381)	(0.505)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,600	16,600	16,600	16,600	3,981	3,981	12,619	12,619	16,600	16,600
Sample	All	All	All	All	Risky	Risky	Non-Risky	Non-Risky	All	All

Robust standard errors clustered at the firm and year level in parentheses; *** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table A7: Bond issuances and interfirm loans using spreads calculated with entrusted loans data.

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (columns 1 and 7 us a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 8 use the dollar value of bond issuances over revenues, and columns 5 and 9 use the dollar value of outstanding bonds over revenues), RMB bond issuer status (columns 4 and 7 us a dummy variable that takes value one if the firm has issued in a given year, columns 5 and 8 use the dollar value of bond issuances over revenues, and columns 6 and 9 use the dollar value of outstanding bonds over revenues),leverage, returns on assets, firm size (log of total assets), other sources of funds, the interaction between dollar issuer and the spread between average entrusted loans rate and dollar bond interest rate (SP$), and the interaction between RMB issuer and the spread between average entrusted loans rate and RMB bond interest rate (SPCNY).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
USDIssuer	1.934	0.470	-0.185				1.848	0.435	-0.208
	(2.981)	(0.859)	(0.917)				(2.983)	(0.860)	(0.918)
USD Issuer x SP$	0.412	0.583**	0.703***				0.396	0.579**	0.700***
	(0.894)	(0.260)	(0.268)				(0.894)	(0.260)	(0.268)
				0.614	0.492	0.015	0.513	0.394	0.025
				(0.742)	(0.342)	(0.030)	(0.744)	(0.342)	(0.030)
CNY Issuer x SPCNY				0.052	-0.052	0.003	0.077	-0.047	-0.007
				(0.285)	(0.119)	(0.016)	(0.285)	(0.119)	(0.016)
Leverage	1.739***	1.705***	1.719***	1.686***	1.794***	1.792***	1.632***	1.700***	1.716***
	(0.529)	(0.528)	(0.528)	(0.531)	(0.528)	(0.528)	(0.531)	(0.528)	(0.528)
ROA	-29.029***	-29.102***	-29.099***	-29.079***	-29.045***	-29.052***	-29.068***	-29.108***	-29.108***
	(1.329)	(1.328)	(1.328)	(1.330)	(1.329)	(1.329)	(1.330)	(1.328)	(1.328)
Size	-0.663***	-0.701***	-0.700***	-0.682***	-0.665***	-0.665***	-0.679***	-0.700***	-0.698***
	(0.144)	(0.143)	(0.144)	(0.144)	(0.143)	(0.144)	(0.144)	(0.143)	(0.144)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	19,989	19,989	19,989	19,989	19,989	19,989	19,989	19,989	19,989
Issuer is:	Dummy	Amount Issuance	Amount Outstanding	Dummy	Amount Issuance	Amount Outstanding	Dummy	Amount Issuance	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses

*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.

Table A8: Bond issuances and interfirm loans using spreads calculated with entrusted loans data. Excluding State-owned firms

This table reports the results of a set of fixed effects regressions in which the dependent variable is inter-firm loans over revenues and the explanatory variables are dollar bond issuer status (columns 1 and 7 us a dummy variable that takes value one if the firm has issued in a given year, columns 3 and 8 use the dollar value of bond issuances over revenues, and columns 5 and 9 use the dollar value of outstanding bonds over revenues), RMB bond issuer status (columns 4 and 7 us a dummy variable that takes value one if the firm has issued in a given year, columns 5 and 8 use the dollar value of bond issuances over revenues, and columns 6 and 9 use the dollar value of outstanding bonds over revenues),leverage, returns on assets, firm size (log of total assets), other sources of funds, the interaction between dollar issuer and the spread between average entrusted loans rate and dollar bond interest rate (SP$), and the interaction between RMB issuer and the spread between average entrusted loans rate and RMB bond interest rate (SPCNY). The sample does not include state-owned firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
USDIssuer	3.341	0.464	-0.148				3.224	0.439	-0.169
	(5.672)	(1.409)	(0.862)				(3.221)	(0.866)	(0.924)
USD Issuer x SPR$	0.553	0.594	0.724***				0.534	0.591**	0.721***
	(1.540)	(0.367)	(0.230)				(0.939)	(0.262)	(0.270)
CNY Issuer				0.466	0.386	0.015	0.361	0.284	0.026
				(0.645)	(0.330)	(0.017)	(0.812)	(0.346)	(0.031)
CNY Issuer x SPRCNY				0.129	-0.043	0.003	0.143	-0.037	-0.007
				(0.229)	(0.099)	(0.013)	(0.313)	(0.120)	(0.016)
Leverage	1.112	1.079	1.096	1.076	1.192	1.187	1.003*	1.075*	1.093*
	(0.848)	(0.846)	(0.846)	(0.856)	(0.848)	(0.847)	(0.584)	(0.580)	(0.580)
ROA	-27.504***	-27.567***	-27.564***	-27.537***	-27.492***	-27.501***	-27.551***	-27.574***	-27.575***
	(2.606)	(2.605)	(2.605)	(2.606)	(2.606)	(2.606)	(1.473)	(1.470)	(1.471)
Size	-0.756**	-0.798***	-0.797***	-0.772***	-0.753**	-0.753**	-0.773***	-0.796***	-0.795***
	(0.295)	(0.294)	(0.294)	(0.296)	(0.296)	(0.296)	(0.159)	(0.159)	(0.159)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	16,600	16,600	16,600	16,600	16,600	16,600	16,600	16,600	16,600
Issuer is:	Dummy	Dummy	Amount Issuance	Amount Issuance	Amount Outstanding	Amount Outstanding	Dummy	Amount Issuance	Amount Outstanding

Robust standard errors clustered at the firm and year level in parentheses

*** statistically significant at 1%, ** statistically significant at 5%, and * statistically significant at 10%.