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#### IMPRESSUM

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# How has the global financial crisis affected syndicated loan terms in emerging markets? Evidence from China

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## Abstract

This paper examines the impact of the recent global financial crisis on the cost of debt capital (syndicated loans) in a leading emerging market, namely China, using difference-in-differences and GARCH approaches. Before the crisis China adopted banking reforms allowing entry of foreign banks and more domestic participation in the syndicated loan market. As a result, during the crisis the volume of syndicated loans grew steadily, in contrast to other countries. In addition, the amount of foreign syndicated loans decreased and average maturity increased compared to the pre-crisis period. Our findings provide useful information to policy makers to devise effective responses to financial crises.

**Keywords:** Loan Spread, Loan Amount, Loan Maturity, China, Financial Crisis.

**JEL Classification:** G21, G32, P34

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## **1. Introduction**

During the last two decades loans have dominated the corporate debt market in the developed economies (Drucker and Puri, 2007); in particular, the volume of syndicated loans has increased at a very rapid rate (Ferreira and Matos, 2012). A similar trend has been observed in emerging markets (Godlewski and Weill, 2008). However, the recent financial crisis has led to a sharp decline (by 67 percent) in gross syndicated lending. Since in most cases the lead arrangers are international banks and financial institutions (Chui et al., 2010), the financial crisis that originated in the developed economies has also affected emerging markets (Dovern and Roye, 2014). Given the borrower-lender and arranger-participant relationship in syndicated loans (Esty, 2001), financial shocks can be transmitted across countries through cross-border syndicated lending (Cetorelli, and Goldberg, 2011; De Haas and Van Horen, 2012; Ding et al., 2013). The increase in international infrastructure financing has resulted in foreign banks participating more in syndicated loans to reduce the risk of default from a single bad project (Brealey, Cooper and Habib, 1996; Ramamurti and Doh, 2004). Factors such as institutional weakness (Young et al., 2014), bank-level governance, country-level governance and previous profitability position (Beltratti and Stulz, 2009; Ivashina and Scharfstein, 2010; Berger and Bouwman, 2013) have all had a negative impact on syndicated loans. The performance of bank-dependent borrowers has also been affected (e.g. Chava and Purnanandam, 2011). A ‘flight home effect’ (Giannetti and Laeven, 2012) is another possible explanation for the decline of the syndicated loan market.

China being one of the biggest economies in the world (Berger et al., 2010), it is interesting to examine the impact of the crisis on its banking system (for some of its features see Hasan et al., 2009, and Jia, 2009). In China, state controlled banks make

most loan decisions expecting corporate borrowers to perform poorly (Bailey et al. 2011), and therefore syndicated loans are the most popular source of corporate finance (Pessarossi and Weill, 2013). The syndicates with lead arrangers from China have increased the loan amount even during the global financial crisis (Chui et al., 2010). However, it remains to be seen how the crisis has affected the cost of such loans, and in particular how the syndicated loan terms with foreign arrangers compare to those with domestic arrangers.

Banks usually diversify their portfolio (Berger et al., 2010), avoid single name exposure, diversify their income sources by incorporating fee income as lead arranger and participate in syndicated loans to address the problems associated with origination capabilities (Godlewski and Weill, 2008). Borrowers also benefit from syndicated loans as larger amounts (Godlewski and Weill, 2008) can be arranged very quickly (Altunbas and Gadanecz, 2004); therefore, other debt markets have almost disappeared in China (Pessarossi and Weill, 2013).

The existing literature on syndicated loans documents agency conflicts arising from the lead arrangers having an information advantage over other participants (Strahan, 1999; Godlewski and Weill, 2008). In addition, there is a moral hazard problem as a higher number of participants leads to less monitoring by banks (Pennacchi, 1988). The agency problem persisted in China during the crisis owing to information asymmetries and poor accounting disclosure systems. Moreover, foreign participation forced the Chinese firms to disclose more information and consequently the extent of monitoring increased (Berger et al., 2010). In fact monitoring and opacity of firms are highly correlated with the loan contract terms. Therefore, unlike existing studies on China only focusing on the volume of syndicated loans during the crisis (Chui et al., 2010), in this paper we examine the impact of the financial crisis on

both price and non-price contract terms of syndicated loans in China. To our knowledge, ours is the first study of this type.

Our empirical approach is twofold. Firstly, we apply a difference-in-differences method to data on 644 non-financial Chinese firms during the period 2000-2012. Secondly, we estimate a dynamic conditional correlation-GARCH model aggregating the data at the monthly syndicated loan level. We find that foreign lead arrangers tend to attract more lead arrangers in a single syndicated loan to overcome the financial difficulties in their home country, and offer a lower spread than the domestic lead arrangers to be competitive in the Chinese market. However, the amount of foreign syndicated loans has decreased during the crisis and their maturity has shortened. Our analysis highlights how the impact of the crisis was mitigated in China by agreeing appropriate syndicated loan contract terms with domestic arrangers, and more generally the strategy that should be followed in emerging markets during global financial crises.

The layout of the paper is the following. Section 2 reviews the relevant literature and develops the hypotheses to be tested. Section 3 gives details of the data and the methodology. Section 4 presents the empirical results. Section 5 concludes.

## **2. Literature review and hypothesis development**

### **2.1 Changes in syndicated loans before and during the crisis**

Demandable debt liabilities of banks give them an incentive advantage over other intermediaries. In the last two decades the debt market has witnessed an acceleration in the growth of syndicated loans (Focarelli et al., 2008; Dennis and Mullineaux, 2000) in both developed (Sufi, 2007) and emerging markets (Godlewski and Weill, 2008). A difference in bank capital before and during the crisis creates difficulties for

bank-dependent borrowers (Demirguc-Kunt et al., 2013; Chava and Purnanandam, 2011). This is evident from the sharp fall in the volume of syndicated loans (Ivashina and Scharfstein, 2010). However, the spread remains quite high and the amount borrowed from banks associated to Lehman Brothers and other failed banks is quite low (Santos, 2011). Syndicated loans have generally declined, but China has been an exception (Okazaki, 2007).

Organising syndication, monitoring and due diligence are the responsibility of one or more lead arrangers (Dennis and Mullineaux 2000). For emerging markets, these are generally international banks (Chui et al., 2010) and the contraction in banks' foreign claims affects the syndicated loan market (De Haas and Van Horen, 2012). Ramamurti and Doh (2004) argue that lenders of a syndicated loan can earn attractive fees and interest rates. Moreover, the pro-market reforms in China allows them to 'securitise' their loans and pass the financial risk onto other investors. This type of securitisation activity has changed the role of lenders, and also stabilises the financial system as risk is allocated economy-wide. Another way of reducing risk is to involve local banks and investors to maintain a business network with political parties. These strategies possibly have enabled China to keep a constant growth of issuance of syndicated loans during the financial crisis.

Chui et al. (2010) find ample supply of credit through local banks in China during that period. This evidence could partially explain the changes in the loan contract terms in China as the country underwent a series of banking sector reforms from 2002 to become a leading market-based economy (see Okazaki, 200; Ahlstrom et al., 2003; Young et al., 2011), and also joined the World Trade Organization in 2001. Murali and Banalieva (2015) showed that the relationship between market reforms and firms' performance is U-shaped because in the initial stages profitability

decreases due to a monitoring vacuum but then, when the reforms are implemented, it rises, which attracts foreign banks. Foreign participants started their local currency business in China in December 2006. Their participation, in addition to other initiatives from the government (such as tax exemptions, strict disclosure rules, acceptance of international accounting rules, enhancing corporate governance norms etc.), has expanded the syndicated loan market in China. Moreover, in China most of the loans originate from state-owned and joint stock commercial banks (Okazaki, 2007). Resource endowment and organising capabilities together help Chinese firms aiming for outward internationalisation (Liang et. al., 2012). Globalisation and faster economic growth also create a greater need for domestic capital, with the presence of foreign banks increasing competition and improving the overall culture of the banking industry (Hasan et al., 2009). Domestic banks expand their activities through their networks (Bartoli et al., 2013), with borrowers preferring them because the government acts as a guarantor in most cases (Jia, 2009). Therefore, since 2008, whilst foreign banks started withdrawing from the Chinese market, the volume of syndicated loans arranged by domestic banks has stayed quite high, and on the whole the syndicate loan market has grown.

The volume of non-performing loans in China has been increasing, despite banking sector reforms and more monitoring of borrowers; this has led to poor profitability, an inadequate level of capital and contraction of the credit supply of banks (Albertazzi and Marchetti 2010). There is a high percentage of non-performing loans and no adequate risk pricing (Okazaki, 2007). Increased participation intensifies competition and the lack of proper accounting information disclosure by firms restricts the monitoring capabilities of banks. In the developed markets information asymmetry shapes syndicated loans (Preece and Mullineaux, 1996; Jones et al. 2005)



because of less transparent borrowers (Dennis and Mullineaux, 2000), their reputation (Lee and Mullineaux, 2004) and their relation with lead arrangers. In addition, there is a correlation between borrower opaqueness and concentration in credit syndicates, which leads to the problem of moral hazard in communication (Sufi, 2007). According to Albertazzi and Marchetti (2010), there is a possible ‘flight to quality’ effect. In other words, larger foreign lead arrangers might have reallocated loans away from risky and opaque Chinese borrowers during the crisis. In such a situation the alternative is ‘zombie lending’ (Bruche and Llobet, 2014), with some insolvent Chinese banks exploiting credit demand in the domestic market by trying to avoid credit losses and arranging syndicated loans for the risky borrowers with flexible loan contract terms.

The literature provides evidence of the impact of syndication on loan spread, maturity and loan amounts in other countries (Focarelli et al., 2008), and also of changes during the crisis (e.g. Strahan, 1999; Ivashina and Scharfstein, 2010; Santos, 2011). Chui et al. (2010) show that the volume of syndicated loans increased during that period, but do not examine the possible effects on loan amounts, spread, maturity and the number of lead arrangers of syndicated loans.

## **2.2 Hypothesis development**

The cost of bank credit remained quite high in the US during the crisis compared to the pre-crisis period (Santos, 2011). Shocks were transmitted to emerging markets through different channels such as cross-border lending, direct foreign bank participation etc. Information asymmetry has kept rising in countries such as China, and therefore foreign arrangers have been finding it difficult to assess the credit worthiness of borrowers.

Before the crisis, domestic banks were the lead arrangers for most syndicated loans in China. Usually, firms prefer to establish relations with well-capitalised banks (Berger et al., 2008); consequently, banks with a higher capital ratio tend to have more information about borrowers and charge a spread premium. In a hierarchical banking structure, it becomes difficult to produce and transmit soft information (Stein, 2002). As a result, information asymmetry between lead domestic arrangers and domestic participants increases. Chinese small and medium industries, in particular, may suffer from a credit crunch (see Berger et al., 2005). Following Rajan (1992), one can argue that, because of information asymmetry and less transparency, the interest rate on syndicated loans is higher during a crisis period. Recent studies also show that firms have paid more to obtain guaranteed access to liquidity during the global financial crisis (Santos, 2011; Bord and Santos, 2014). Jiangli et al. (2008) concluded that lending relationships mattered during the Asian crisis. There is evidence of a strong relationship between domestic banks and firms before the crisis that also continued during the crisis (Bartoli et al., 2013; Chodorow-Reich, 2014). Therefore, domestic arrangers are always in a more advantageous position than foreign arrangers because of their past relationships with firms. On the other hand, during the crisis foreign arrangers, mainly from the developed countries, have viewed China as a more financially stable market than their own economically imbalanced domestic ones. Thus, in order to offset the losses arising from non-performing loans in their home countries, they have offered lower interest to credit-worthy Chinese borrowers. The above discussion suggests the following hypotheses to test:

*H1: During the financial crisis in China the interest rate increased less for foreign than for domestic syndicated loans.*

Syndicated loans contribute towards financial development and stability in emerging markets (Godlewski and Weill, 2008). During the crisis they fell in developed markets where lead arrangers were severely hit (Santos, 2011). However, in China, where the financial sector had been growing steadily and had been strengthened by various reforms (Okazaki, 2007), the supply of credit remained steady during the crisis. Because of the sovereign debt crisis and the collapse of several financial institutions in 2008-2009, with the consequent crisis in confidence for the syndicated loan arrangers (mainly from developed markets), lending fell during the financial crisis (Popov and Van Horen, 2013). Foreign arrangers withdrew from the Chinese syndicated loan market, and also made more use of securitisation and reduced their loan supply (Bonaccorsi di Patti and Sette 2012). Since the liquidity position of the domestic lead arrangers did not change during the crisis, the total amount of syndicated loans was affected.

*H2: During the financial crisis in China foreign syndicated loans decreased relative to domestic syndicated loans.*

Usually banks prefer to lend for longer maturities to reduce moral hazard (Coleman et al., 2006). In China, the banking system is almost 100 percent government-owned (Dobson and Kashyap, 2006), and owing to lack of monitoring by state-owned banks and a weak institutional framework, the country is far behind in terms of capital allocation efficiency. Moreover, if there are many lenders the necessary monitoring

decreases because the lead arrangers may exploit their informational advantage to obtain an information rent (Bruche and Llobet, 2014). Then, participants cannot understand the willingness of lead arrangers to monitor borrowers, which leads to non-performing loans. In the case of syndicated loans, when there is a need for diligence and monitoring by borrowing firms, the lead arrangers usually prefer concentrated loans, i.e. holding a large fraction of the loan (Sufi, 2007); however, if there is less information asymmetry, they tend to have a preference to hold smaller amounts (Focarelli et al., 2008). Consequently, the syndicate requires more arrangers and participants. Many banks take this opportunity to diversify their risks by becoming a member of the syndicate.

Loan maturity reflects the borrower risk (Nandy and Lodh, 2012), which is also associated with the loan spread. According to the credit quality hypothesis, lenders prefer a short maturity period for any loan as it gives them the opportunity to assess regularly the credit position of firms (Diamond, 2004). On the other hand, the trade-off hypothesis states that the loan spread increases with the maturity period (Gottesman and Roberts, 2004). A recent study (Alexandre et al., 2014) provides evidence that firms managed to obtain longer maturities during the crisis when they had a stronger lending relationship before the crisis. Therefore, we hypothesise that in China more domestic banks' participation and poor accounting disclosure allow the arrangers to assess the credit worthiness of firms, and as a result information asymmetry between the syndicated lenders and the borrowers is significant. In the crisis period the borrowers go through a tight screening process by foreign banks when these enter the Chinese market. This reduces the firms' opacity to some extent. But due to the contraction in the operation of foreign banks in the Chinese credit

market during the crisis, information asymmetry widened. Therefore, we test the following hypothesis:

*H3: During the financial crisis in China loan maturity remained longer for foreign syndicated loans compared to domestic syndicated loans.*

In a syndicated loan the lead arrangers take the responsibility of originating it and share it with other financial institutions (Ivashina and Scharfstein, 2010a). They usually keep one third of the syndicate loan and sell the rest to other syndicate investors. This may create information asymmetry between the lead arranger and the other participants, with the former possessing more information. But if the participants are not satisfied with the information about the borrowers, then the lead arranger(s) might want to share the risk with other lead arrangers both in the domestic and foreign markets. In such a situation, they may hold less than one third of the syndicated loan. On the other hand, lenders are always more inclined to giving loans to firms with high profitability (Berger and Udell, 1990; Saidenberg and Strahan, 1999): the lead arrangers may charge less interest and may arrange loans with a longer maturity to attract more borrowers for the syndicated loans.

Banks' lending portfolios carry a considerable amount of country-specific risk (Fang and Lelyveld, 2014). During the financial crisis, the capital position of the foreign arrangers in their home country remained quite weak. They were attracted to China because of its financial stability. A single lead arranger cannot provide the required syndicated loan amount due to capital inadequacy and therefore might involve other lead arrangers from the domestic and foreign markets. This leads to formulating the following hypothesis:

*H4: During the financial crisis in China the number of lead arrangers increased for foreign syndicated loans compared to domestic syndicated loans.*

### **3. Data and Methodology**

#### **3.1 Sample and Variable Description**

To test the effects of the global financial crisis on both price and non-price terms of syndicated loans we use loan information for China from the ThomsonOne Deal database. We also match a few companies with the Worldscope and Bloomberg database to increase the number of observations. We start with all borrowers in the database and then identify the non-financial firms. In China in our sample period, which goes from 2000 to 2012, there are 809 non-financial borrowers and 1018 firm-bank pairs of which 749 have at least two loans.

Following the literature (e.g. Santos, 2011), the “crisis period” is defined as 2007-2009. More specifically, the fourth quarter of 2007 is taken to be the start of the crisis. Because of reforms in the banking sector, many foreign banks had started acting as lead arrangers in China in the syndicated loan market, putting an end to the dominance of domestic firms (McCaule et al., 2002). However, during the crisis a number of domestic banks competed with foreign banks to arrange loans as lead arrangers. Thus to capture the changes in loan contract terms during the financial crisis, we define the pre-crisis period as 2000-2006, and the post-crisis period as 2010-2012, which enables us to investigate the effects of the financial crisis on loan terms also in the follow-up period.

Any loan contract consists of both price and non-price terms (Melnik & Plaut, 1986); Strahan (1999) argues that firms pay a higher interest rate when non-price terms become more restrictive. Therefore, we consider both price and non-price terms

of syndicated loans as follows. *Loan Spread* is an all-in-drawn spread: it displays all spreads at multiple levels based on the margin in basis points and includes the base rate spread and facility, upfront, utilisation or fronting fee in the database. *Loan Amount* in the ThomsonOne database is the full loan package amount for the target market for all tranches and is reported in millions. *Loan Maturity* is another important loan contract term and is measured in years in our study. It is calculated as the difference between the maturity date and the issue date of the loans, where the former is the latest possible maturity date and, if the loan is extendable, the extra years are added to obtain the final maturity, and the issue date for syndicated loans is the announcement date of the transaction. The last loan term considered in the model is the *Lead Arranger*. The mandated arrangers are the lead agent banks named in a mandate letter for a particular loan. The mandated arranger title has been in use since January 2000. In Asia, mandated arrangers are the named lead agents in a mandate letter for a particular syndicate and may not be restricted to the Administration, Syndication or Documentation Agents.

Banks assess the creditworthiness of firms before deciding on loan contract terms and focus on several firm-level factors. Therefore, following the literature (e.g. Santos, 2011; Strahan, 1999) we control for firm characteristics. Big firms are assumed to have a lower default probability; therefore we include *Firm Size*, which is defined as the log of total assets. These may need more loans with long maturities for their activities but the spread could be lower than for smaller firms because of the lower default probability. *Profitability* is measured by the return on assets (ROA). Higher returns for firms implies less risk from the bank's perspective. More profitable firms may require more loans but may pay less interest as they are considered to be less risky. Older firms are more established and are also viewed as less risky. We

capture this by including *Firm Age*, which is defined as the log of age. Such firms may obtain more loans with long-term maturity and also pay less interest. *Financial Leverage* is long-term debt over total equity. There is a higher default probability if the firm borrowing is highly debt- dependent, especially during a crisis period. These borrowers may get more loans with a shorter maturity. However, the spread may be higher.

We also include the *PE Ratio*, which is defined as the current price divided by earnings. High growth firms may get more loans with a shorter maturity and a bigger spread. Another variable is *EBIT*, i.e. earnings before interest and tax. Higher earnings suggest a lower default probability. The lead arrangers of a syndicated loan can influence the loan terms with their contribution to the loan (Jones et al., 2005), therefore we control for the percentage of loans (principle amount) of lead arrangers. The variable *Share of lead arranger* is also included in the model. Most banks check credit ratings. We use Moody's *Credit Rating*. According to their generic rating, firms have minimal default risk if they belong to Aaa and the risk is higher for category B and C. Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks at the higher end of its generic rating category; 2 indicates a mid-range ranking, and 3 a ranking at the lower end of that generic rating category. Different industries may be associated with different levels of risk, therefore we also include *Industry*.

### **3.2 Data Summary**

Table 1 shows the summary statistics for three categories: *domestic syndicated loans* (all lead arrangers in a syndicated loan are from China), *foreign syndicated loans* (at least one lead arranger of a syndicated loan is from a foreign country) and the full



sample. The maximum loan amount is 39,000 (US\$, mil), which is for a domestic syndicated loan group. The maximum foreign syndicated loan is 6,000 (US\$, mil); it is arranged by a maximum of 23 lead arrangers, whereas a maximum 8 lead arrangers are involved in a domestic syndicated loan. The average all-in-drawn spread for domestic syndicated loans is higher than for foreign syndicated loans. However, the average maturity period (years) is higher for the former than for the latter.

**Insert Table 1 about here**

## **4. Empirical results**

We proceed in two steps to test the hypotheses of interest: first, we analyse an unbalanced panel; second, we aggregate the data to create time series at the loan-month level and estimate a dynamic conditional correlation-GARCH model to investigate the co-movement of loan contract terms in China during the financial crisis.

### **4.1 Panel data approach (Difference-in-differences)**

#### **4.1.1 Model**

To examine the impact of the global financial crisis on the price and non-price terms of syndicated loan terms in China we estimate the following model:

$$Y_{it} = \alpha_i + \beta_1 Foreign_{it} + \beta_2 Crisis_{it} + \beta_3 Foreign_{it} * Crisis_{it} + \beta_4 FollowUp_{jt} + \beta_5 X_{it} + \epsilon_{it} \quad (1)$$

where  $Y_{it}$  indicates the Loan Spread, Loan Amount, Loan Maturity and Lead Arranger respectively for the  $i$ th loan in year  $t$ , and  $\alpha_i$  is the firm's fixed effect capturing any time-invariant and unobserved firm characteristic. *Foreign* is a dummy equal to 1 for

the treatment group when one or more lead arrangers are from foreign banks and 0 otherwise. Note that in the control group all the lead arrangers are from China. Crisis is a dummy equal to zero if the loan is issued during the period from the fourth quarter of 2007 to the fourth quarter of 2009, and is equal to one from the first quarter of 2010 to the fourth quarter of 2012 (the post-crisis or follow-up period). We also include three dummies to capture any changes in the follow-up period ( $T=2010-2012$ ) relative to the crisis period, namely FollowUp10, FollowUp11 and FollowUp12, each of which is equal to 1 for the corresponding year and 0 otherwise.  $X_{it}$  is the vector of controls explained in Section 3.1.  $\varepsilon_{it}$  is the usual error term. The  $\alpha$  and  $\beta$ s are parameters to be estimated, with  $\beta_3$  identifying the causal effects of the global financial meltdown on loan contract terms, i.e the change in  $Y$  before and after the treatment for the treated group with respect to controls.

We estimate the model with clustering at the industry level using the difference-in-differences (diff-in-diff) method. The underlying assumption is that the time trend on the treatment and control groups is the same as in the absence of treatment, which is difficult to verify. Therefore, as a robustness check we use pre-treatment data to see if the trends are indeed the same.

#### **4.1.2 Results for the difference-in-differences model**

Column 1 of Table 2-5 shows the estimation results for the model with diff-in-diff without the control variables. The  $R^2$  is small for all four models (see Table 2 and 5 in particular). The results when including all the relevant firm-level control variables and the syndicated loan terms variables step-wise are reported in the other columns in Tables 2-5.

**Insert Table 2 about here**

In Table 2 the coefficients of the interaction term (*foreign*  $\times$  *crisis*) in Columns 2-4 are negative and statistically significant. Column 4 suggests that the relationship is much stronger (significant at the 5 percent level) when including all the firm-level control variables and the necessary controls for loan terms. These results support Hypothesis 1 i.e. during the crisis the loan spread remains lower for foreign compared to domestic syndicated loans. Interestingly, the coefficients of FollowUp11 and FollowUp12 are positive and significant. It may be the case that from 2011, when the financial markets of the developed countries started improving, the foreign lead arrangers found ways to recover their financial position in their domestic markets. Moreover, during the crisis they established good relationships ('guanxi' or personal relationships or networks) with the Chinese borrowers, and to compensate their low spread during the crisis increased interest rates in the post-crisis period.

**Insert Table 3 about here**

Table 3 shows that the coefficient of the interaction term is statistically significant and negative in all cases. In particular, there was a 19 percent decrease (significant at the 5 percent level) of foreign syndicated loans relative to the pre-crisis period (see Column 4 of Table 3). This very strongly supports our Hypothesis 2 that during the crisis foreign syndicated loans decreased. In the follow-up period we do not find any significant changes (except for the year 2011 in Column 3). We interpret this result as suggesting that the total amount of loans remained unchanged owing to the more active involvement of domestic banks in China as the focus of foreign banks shifted to their domestic markets. This is consistent with previous findings (Chui et al., 2010).

**Insert Table 4 about here**

In Table 4 the coefficient of diff-in-diff is positive and statistically different from zero (at the 1 percent and 5 percent level), which supports Hypothesis 3. This implies that

during the crisis the foreign syndicate loan providers imposed longer maturities and that this continued in the follow-up period. The reason is that the Chinese market was stable during the crisis and foreign banks experienced less risk compared to other countries including their own. Moreover, due to financial market and banking reforms in China, the improved credit scoring reduced uncertainty about borrowers (see Berger et al. 2005).

#### **Insert Table 5 about here**

The statistically significant and positive coefficient in Table 5 supports Hypothesis 4, i.e. that during the financial crisis the number of lead arrangers increases for the foreign syndicated loans to diversify risk and to compensate capital inadequacy in their home country. It also appears that in the follow-up period (in 2012) the number of lead arrangers continued to increase.

Overall, we find empirical support for the hypotheses formulated above. During the financial crisis foreign syndicated loans decreased despite a higher number of lead arrangers and longer maturities. However, to cope with the imbalances in the global economy and the credit market crunch, the foreign syndicated loan providers kept lower spreads by diversifying their risk through a number of lead arrangers.

#### **4.2 Time-series approach (DCC-GARCH model)**

In this section, we explore the effects of the financial crisis on the aggregate loan spread-maturity, loan spread-amount and loan amount-maturity relationships. A simple correlation analysis would not be sufficient for this purpose; we use instead Engle's (2002) time-varying dynamic conditional correlation (DCC)-GARCH model.

To begin with, we carry out some diagnostic tests. The results are presented in Table 6. The Ljung-Box Q statistic indicates serial correlation in all the variables. The

ADF (augmented Dickey-Fuller) results imply that they are all stationary, except the loan amount, which contains a unit root. We find a structural break in August 2009, which corresponds to the collapse of Lehman Brothers. The Zivot and Andrews statistics indicate that the spread and maturity of domestic syndicated loans are stationary in levels with structural breaks in the post-financial crisis periods. The opposite holds for the loan amount. The Lagrange multiplier (LM) test for ARCH with 15 and 10 lags respectively for foreign and domestic syndicated loans rejects the null hypothesis of homoscedasticity for all the variables and justifies the use of GARCH-type models to capture the time-varying volatility present in the series.

**Insert Table 6 about here**

In order to investigate the impact of financial shocks on the co-movement between loan amount, spread and maturity, we follow the following DCC-GARCH modelling approach (Engle 2002). Let  $Y_t \equiv [y_{1t} y_{2t}]'$  be a  $2 \times 1$  vector containing any two of the variables such as the Loan amount or maturity or Loan spread and amount series in a conditional mean equation as below:

$$M(L)Y_t = \epsilon_t, \text{ where } \epsilon_t | \phi_{t-1} \sim N(0, H_t), \text{ and } t=1, 2, \dots, T$$

where  $M(L)$  is a matrix in the lag operator  $L$  and  $\epsilon_t$  is a vector of innovations based on the information set,  $\phi$ , available at time  $t-1$ .

The vector  $\epsilon_t$  has the following conditional variance-covariance matrix:

$$H_t = D_t R_t D_t \dots \dots \dots (2)$$

where  $D_t = \text{diagonal}(\sqrt{h_{it}})$  is a  $2 \times 2$  diagonal matrix of time-varying standard deviations from univariate GARCH models, and  $R_t \equiv [\theta_{ij}]_t$  for  $i, j=1$  and  $2$ , is a correlation matrix containing conditional coefficients. Note that  $R_t$  varies over time. The standard deviations in  $D_t$  follow the univariate GARCH (P,Q) process as follows:

$$h_{it} = \gamma_i + \sum_{p=1}^{P_i} \alpha_{ip} \epsilon_{it-p}^2 + \sum_{q=1}^{Q_i} \beta_{iq} h_{iq-q} + \delta_i \epsilon_{t-1}^2 \dots \dots \dots (3)$$

for all  $i=1,2$ .

The DCC-GARCH model is estimated in two steps (see Engle, 2002); the likelihood function of the DCC estimator is as follows:

$$L = -\frac{1}{2} \sum_{t=1}^T [k \log(2\pi) + 2 \log(|D_t|) + \log(|R_t|) + \epsilon_t' R_t^{-1} \epsilon_t] \dots \dots \dots (4)$$

It has two components: volatility ( $D_t$ ) and correlation ( $R_t$ ).

The DCC (M, N) component can be written as:

$$R_t = Q_t^{*-1} Q_t Q_t^{*-1}$$

where

$$Q_t = \left( 1 - \sum_{m=1}^M a_m - \sum_{n=1}^N b_n \right) \bar{Q} + \sum_{m=1}^M a_m (\epsilon_{t-m} \epsilon_{t-m}) + \sum_{n=1}^N b_n Q_{t-n} \dots \dots \dots (5)$$

$\bar{Q}$  is the time-invariant variance-covariance obtained from estimating equation (3), and  $Q_t^*$  is a  $2 \times 2$  diagonal matrix containing the square root of the diagonal elements of  $Q_t$ . In particular, the key element of interest is  $R_t = \frac{q_{ij,t}}{\sqrt{q_{ii,t} q_{jj,t}}}$ , where  $j=1, 2$ .  $R_t$  is a  $2 \times 2$  matrix comprising the conditional correlations.

#### 4.2.2 Estimation results for the DCC-GARCH model

Table 7 presents the results for the DCC (1,1) model. All the parameters of the univariate GARCH model  $(\alpha, \beta_1, \beta_2, \delta)$  are more appropriate for syndicated loan amount, spread and maturity when one (or more) of the mandated arrangers is a foreign bank than when the syndicated loan is purely from domestic banks. The significance of the GARCH parameters indicates the presence of time variation and dependence of the variance. A sum of  $a_m$  and  $b_n$  close to 1 indicates high persistence in the conditional variance (see Equation (5)).

#### **Insert Table 7 about here**

Although the Chinese government opened up the banking sector to foreign players with an agreement with the World Trade Organization (WTO) in December 2001, it took five years for private foreign banks to enter the country according to the agenda called ‘national treatment’ for foreign banks. Following the privatisation process of this sector through foreign, public and domestic legal ownerships, domestic banks have flourished. They have shifted their focus from corporate business to consumer-oriented business such as mutual funds, mortgage financing and personal loans, which have been helped by a liberalised interest rate regime. As a result the share of non-performing loans in gross loans has decreased from 20 percent in 2003 to less than 1 percent in 2011 (Global Financial Development Database, 2013). During this time domestic banks have faced the challenge of ensuring that loans finance real production and capital formation rather than fuel speculation. An important issue for foreign banks is whether to engage in new investment projects or issue more debt. Given the financial crisis in the developed world, a market such as China with more than 10% annual growth looks very attractive. Figure 1 shows the dynamic correlation between loan amount and loan spread of foreign syndicated loans. It clearly shows

that the entry of foreign banks into China peaked in 2005. During the crisis period (2007-2009) foreign syndicated loans and spread fluctuated. In particular, Kalman filtering shows a sharp fall of their correlation in the fourth quarter of 2008 (see Figure 2).

**Insert Figure 1 and 2 about here**

Owing to the very robust growth of the economy, the corporate sector in China required diversified channels of funding, stable and strong credit growth and interest rate reforms. Interestingly, during 2000-2007 the share of assets held by foreign banks rose with a peak of above 2 percent, but as a result of the financial crisis it fell to 1.75 percent (Global Financial Development Database, 2013). This can be seen in Figure 3, which shows a considerable decrease in the correlation between the spread of foreign syndicated loan and maturity period during the financial crisis, when the main target of foreign banks was to avoid default, and therefore lower interest rates and shorter maturities were offered.

**Insert Figure 3 and 4 about here**

Figure 4 shows the dynamic correlation between foreign syndicated loan amount and maturity; this fluctuated widely during the financial crisis, it peaked of 0.78 in August 2008 and fell as low as 0.3 in July 2009.

### **4.3 Robustness Tests**

Next we check the sensitivity of our main results on the existence of *flight to quality* (or banks' response to heterogeneity of borrowers) during the financial crisis, in particular after the Lehman Brothers' collapse. The results of the robustness tests are reported in Table 8.



First we consider an alternative definition of the crisis period. Since the financial crisis was at its peak in the fourth quarter of 2008 we define Crisis as a dummy equal to 1 if the loan is announced between the fourth quarter of 2008 and the fourth quarter of 2009 and 0 otherwise. In this revised set up, we exclude the borrowers with \$200,000 mil USD market capitalisation (there are 19 of them), and estimate the model again by the difference-in-differences method. The coefficients are reported in Panel A of Table 8. The results are qualitatively the same as the main ones displayed in Tables 2-5.

**Insert Table 8 about here**

We then select firms on the basis of their credit rating. We exclude firms with rating Aa2, A2 and A3 (top rating grades with A's in our sample). These are the firms with the lowest default rate, i.e. the lowest risk. We re-estimate the model in this case (with foreign syndicated loans only offered to the less risky borrowers in the Chinese market to reduce their risk of default) and find again that the main results are robust (see Panel B of Table 8). Therefore, we conclude that during the financial crisis the foreign syndicated loan arrangers targeted the entire Chinese market, irrespective of the borrowers' risk. This is also evident from our finding that foreign syndicated loans have flexible loan contract terms, such as lower spread and longer maturity.

Table 8 reports the estimation results by clustering at the industry level. In order to ascertain whether both foreign and domestic syndicated loans have a similar time trend in the absence of a financial market meltdown, we also estimate the model by firm fixed effect using the pre-treatment data (these results are not reported). Bertrand et al. (2004) show that the conventional standard errors often understate the standard deviation of the diff-in-diff estimators, therefore we compute block bootstrapping standard errors. As we do not have the same information set as the

lenders, we cannot check whether Basel II risk-sensitive capital requirement effects drive our results. A future study could investigate this issue.

## **5. Conclusions**

The importance of syndicated loans in the corporate debt market has been highlighted both in the theoretical and empirical literature. During the global financial crisis their volume was squeezed in most countries (Ivashina and Scharfstein, 2010) and banks from the developed countries quit the emerging markets (Chava and Purnanandam, 2011). In China, however, the reforms implemented before the crisis enabled domestic banks and financial institutions to play a bigger role in the syndicated loan market. As a result the volume of syndicated loans in China grew steadily during the crisis (Chui et al., 2010). The present paper examines not only lending volumes, but also the cost of debt, and more generally both the price and non-price terms of syndicated loans. It emerges that foreign syndicated loans offered lower interest rates to attract more Chinese borrowers. Moreover, the loan amount was lower for longer maturities in the case of foreign syndicated loans in China. Domestic syndicated loan arrangers tended to offer better non-price than the price-terms. This has resulted in a constant credit supply in China during the global financial crisis.

Our findings contribute to the literature on cross-border syndicated loans and on syndicated loans in emerging economies during financial crises. Information on banks' lending volumes in emerging markets is not sufficient to design policy responses to financial crises, the amount and cost of debt should also be examined. Our study of the Chinese case suggests that the impact of the financial crisis in emerging markets was mitigated by appropriate syndicated loan contract terms. It

provides important information to policy makers of other emerging countries aiming to design an effective debt market strategy to tackle future global crises, since bank credit has a significant impact not only on firms' activities but also on the macroeconomy (Campello et al., 2010). A follow-up study will investigate such effects in the post-crisis period.

## References

- Ahlstrom, D., Young, M. N., Nair, A., and Law, P. (2003). Managing the institutional environment: Challenges for foreign firms in post-WTO China. *SAM Advanced Management Journal* 68:41–49.
- Alexandre, H., Bouaïss, K., Refait-Alexandre, C. (2014). Banking relationships and syndicated loans during the 2008 financial crisis. *Journal of Financial Services Research* 46(1): 99-113.
- Altunbas, Y., and Gadanez, B., (2004). Developing country economic structure and the pricing of syndicated credits. *Journal of Development Studies* 40: 143–173.
- Albertazzi, U. and Marchetti, D. J. (2010). Credit supply, flight to quality and ever greening: an analysis of bank-firm relationships after Lehman, Temi di discussione, Working Paper No. 756, Bank of Italy.
- Bailey, W., Huang, W., Yang, Z. (2011). Bank Loans with Chinese Characteristics: Some Evidence on Inside Debt in a State-Controlled Banking System. *Journal of Financial and Quantitative Analysis* 46(6): 1795-1830.
- Bartoli, F., Ferri, G., Murro, P. and Rotondi, Z. (2013). Bank–firm relations and the role of Mutual Guarantee Institutions at the peak of the crisis. *Journal of Financial Stability* 9: 90-104.
- Beltratti, A., and Stulz, R.M., (2009). Why did some banks perform better during the credit crisis? A cross-country study of the impact of governance and regulation. NBER Working Paper 15180.
- Berger, A. N., DeYoung, R., Flannery, M. J., Lee, D., and Oztekin, O., (2008). How do large banking organizations manage their capital ratios? *Journal of Financial Services Research* 34 (2-3): 123-149.
- Berger, A. N. and Udell, C. H. S., (2013). How does capital affect bank performance during financial crises? *Journal of Financial Economics* 109 (1): 146-176.
- Berger, A. N., Espinosa-Vega, M. A., Udell, W. and Udell, N. H. (2005). Debt maturity, risk and asymmetric information. *Journal of Finance* 60(6): 2895-2923
- Berger, A. N., Udell, N. H., Petersen, M. A. Rajan, R. G. and Stein, J. C. (2005). Does function follow organizational form? Evidence from the lending practices of large and small banks. *Journal of Financial Economics* 76(2):237-269.
- Berger, A.N., Hasan, I. and Zhou, M. (2010). The effects of focus versus diversification on bank performance: Evidence from Chinese banks. *Journal of Banking and Finance* 34: 1417-1435.

- Bertrand, M., Duflo, E and Mullainathan, S., (2004). How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics* 119(1): 249-275.
- Bord, V. M. and Santos, J. A. C., (2014). Banks' liquidity and the cost of liquidity to corporations. *Journal of Money, Credit and Banking*, 46(s1):13-45.
- Bonaccorsi, di Patti, E. and Sette, E. 2012. Bank balance sheets and the transmission of financial shocks to borrowers: Evidence from the 2007-2008 crisis. Bank of Italy Temi di Discussione, Working Paper, No. 848.
- Brealey, R. A., Cooper, I. A., and Habib, M. A. (1996). Using project finance to fund infrastructure investments. *Journal of Applied Corporate Finance* 9: 25–38.
- Bruche, M and Llobet, G., (2014). Preventing zombie lending. *Review of Financial Studies* 27(3): 923-956.
- Campello, M., Graham, J. R and Harvey, C. R., (2010). The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics* 97: 470-487.
- Cetorelli, N., and Goldberg, L.S., (2011). Global banks and international shock transmission: Evidence from the crisis. *IMF Economic Review* 59: 41-76.
- Chava, S., and Purnanandam, A., (2011). The effect of banking crisis on bank-dependent borrowers. *Journal of Financial Economics* 99: 116–35.
- Chui, M., Domanski, D., Kugler, P., and Shek, J., (2010). The collapse of international bank finance during the crisis: Evidence from syndicated loan markets. *BIS Quarterly Review* Sep: 39-49.
- Chodorow-Reich, G. (2014). The employment effects of credit market disruptions: Firm-level evidence from the 2008-2009 financial crisis. *Quarterly Journal of Economics* 129: 1-59.
- Coleman, A.D.F., Esho, N., Sharpe, I.G. (2006). Does bank monitoring influence loan contract terms. *Journal of Financial Services Research* 30(2):177-198.
- Dinga, C.G., Wua, C.H. and Chang, P.L.(2013). The influence of government intervention on the trajectory of bank performance during the global financial crisis: A comparative study among Asian economies. *Journal of Financial Stability* 9: 556-564.
- De Haas, R., and Van Horen, N., (2012). International shock transmission after the Lehman Brothers collapse: Evidence from syndicated lending. *American Economic Review* 102(3): 231-237.
- Demirguc-Kunt, A., Detragiache E., and Merrouche, O., (2013). Bank capital: Lessons from the financial crisis. *Journal of Money, Credit and Banking* 45: 1147-1164.

- Dennis, S., and Mullineaux, D.J., (2000). Syndicated loans. *Journal of Financial Intermediation* 9: 404–426.
- Diamond, D. W., (2004). Committing to commit: Short-term debt when enforcement is costly. AFA Presidential Address. *Journal of Finance* 59: 1447–1480.
- Dobson, W. and Kashyap, A. K., (2006). The contradiction in China’s gradualist banking reforms. *Brookings Panel on Economic Activity* (2):1-60.
- Doverna, J and Royeb, B.V. (2014). International transmission and business-cycle effects of financial stress. *Journal of Financial Stability* 13: 1-17.
- Drucker, S., and M. Puri., (2007). Banks in capital markets: A survey. In *Empirical Corporate Finance*, edited by E. Eckbo. *Handbooks in Finance*, 189–232. Amsterdam: Elsevier/North-Holland Publishers.
- Engle, R., (2002). Dynamic conditional correlation: A simple case of multivariate generalized autoregressive conditional heteroskedasticity models. *Journal of Business and Economics Statistics* 20, 3: 339-350.
- Esty, B., (2001). Structuring loan syndicates: a case study of the Hong Kong Disneyland project loan. *Journal of Applied Corporate Finance* 14.3: 80–95.
- Fang, Y. and Lelyveld, I.V. (2014). Geographic diversification in banking. *Journal of Financial Stability* 15:172-181.
- Ferreira, M. A., and Matos, P., (2012). Universal banks and corporate control: Evidence from the global syndicated loan market. *Review of Financial Studies* 25(9): 2703-2744.
- Focarelli, D., Pozzolo, A. F., and Casolaro, L., (2008). The pricing effect of certification on syndicated loans. *Journal of Monetary Economics* 55: 335–349.
- Giannetti, M., and Laeven, L., (2012). The flight home effect: Evidence from the syndicated loan market during financial crises. *Journal of Financial Economics* 104(1): 23-43.
- Godlewski, C. J., and Weill. L., (2008). Syndicated loans in emerging markets. *Emerging Market Review* 9: 206-219.
- Gottesman, A. A., and Roberts, G. S. (2004). Maturity and corporate loan pricing. *Financial Review* 38: 55–77.
- Hasan, I., Wachtel, P., and Zhou, M. (2009). Institutional development, financial deepening and economic growth: evidence from China. *Journal of Banking and Finance* 33: 157–170.
- Ivashina, V., and Scharfstein, D. S., (2010). Bank lending during the financial crisis of 2008. *Journal of Financial Economics* 97: 319–338.

- Ivashina, V., and Scharfstein, D. S., (2010a). Loan syndication and credit cycles. *American Economic Review Papers and Proceedings* 100(2): 1–8.
- Jensen, M. C., and Meckling, W. H., (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305–360.
- Jia, C., (2009). The effect of ownership on the prudential behavior of banks – the case of China. *Journal of Banking and Finance* 33: 77–87.
- Jiangli, W., Unal, H., Yom, C., (2008). Relationship Lending, Accounting Disclosure, and Credit Availability during the Asian Financial Crisis. *Journal of Money, Credit and Banking* 40(1): 25-55.
- Jones, J., Lang, W. W., and Nigro, P. J., (2005). Agent bank behavior in bank loan syndications. *Journal of Financial Research* 28 (3): 385–402.
- Lee, S.W., and Mullineaux, D.J., (2004). Monitoring, financial distress, and the structure of commercial lending syndicates. *Financial Management*: 107–130.
- Liang, X., Lu, X., Wang, L. (2012). Outward internationalization of private enterprises in China: The effect of competitive advantages and disadvantages compared to home market rivals. *Journal of World Business* 47(1): 134-144.
- McCauley, R., Fung S. and B. Gadanecz, (2002). Integrating the finances of East Asia. *BIS Quarterly Review*, December.
- Melnik, A., and Plaut, S., (1986). Loan commitment contracts, terms of lending, and credit allocation. *Journal of Finance* 41: 425–435.
- Murali, D. R. Chari and Banalieva, E. R. (2015). How do pro-market reforms impact firm profitability? The case of India under reform. *Journal of World Business* 50: 357-367.
- Nandy, M., and Lodh, S., (2012). Do banks value the eco-friendliness of firms in their corporate lending decision? Some empirical evidence. *International Review of Financial Analysis* 25: 83–93.
- Okazaki, K., (2007). Banking system reform in China the challenges of moving toward a market-oriented economy. RAND/OP-194-CAPP.
- Pennacchi, G., (1988). Loan sales and the cost of bank capital. *Journal of Finance* 43(2): 375–396.
- Pessarossi, P., and Weill, L., (2013). Choice of corporate debt in China: The role of state ownership. *China Economic Review* 26: 1-16.
- Preece, D., and Mullineaux, D.J., (1996). Monitoring, loan renegotiability, and firm value: The role of lending syndicates. *Journal of Banking and Finance* 20: 577–593.

Popov, A. and Van Horen, N., (2013). The impact of sovereign debt exposure on bank lending: Evidence from the European debt crisis, DNB Working paper. No. 382 June.

Rajan, R. G., (1992). Insiders and outsiders: The choice between Informed and arm's-length debt. *Journal of Finance* 47: 1367–1400.

Santos, J.A.C., (2011). Bank corporate loan pricing following the subprime crisis. *Review of Financial Studies* 24(6): 1916-1943.

Strahan, P. E., (1999). Borrower risk and the price and non-price terms of bank loans. Working Paper.

Stein, J. C. (2002). Information production and capital allocation: decentralization versus hierarchical firms. *Journal of Finance* 57(5): 1891-1921.

Sufi, A., (2007). Information asymmetry and financing arrangements: Evidence from syndicated loans. *Journal of Finance* 62: 629–668.

Young, M. N., Tsai, T., Wang, X., Liu, S., Ahlstrom, D. (2014). Strategy in emerging economies and the theory of the firm. *Asia Pacific Journal of Management* 31(2): 331–354.

Young, M. N., Ahlstrom, D., Bruton, G. D., and Rubanik, Y. (2011). What do firms from transition economies want from their strategic alliance partners? *Business Horizons* 54(2):163–174.



**Table 1: Descriptive statistics**

Variables	Domestic					Foreign					Full				
	Obs	Mean	Std. Dev.	Min.	Max.	Obs	Mean	Std. Dev.	Min.	Max.	Obs	Mean	Std. Dev.	Min.	Max.
Loan Spread	81	160.8	157.54	25	798	294	200.06	151.93	17	1350	375	191.58	153.8	17	1350
Loan Amount	377	895.1	3142.09	0.63	39000	641	243.49	520.28	1.23	6000	1018	484.8	1979.79	0.63	39000
Loan Maturity	353	7.7	6.84	0.53	35.08	613	4.36	3.4	0.19	26	966	5.58	5.2	0.19	35.08
Lead Arranger	377	1.31	0.84	1	8	641	2.98	2.76	1	23	1018	2.36	2.39	1	23
Firm Size	15	9.94	1.41	8.04	12.18	106	10.51	1.37	6.11	12.06	121	10.44	1.39	6.11	12.18
Profitability	15	0.02	0.02	0	0.07	93	0.01	0.02	-0.03	0.18	108	0.01	0.02	-0.03	0.18
Firm Age	94	2.57	0.91	2	4.54	263	2.76	0.56	2.1	4.5	357	2.71	0.68	2	4.54
Financial Leverage	15	0.12	0.11	0	0.37	94	0.1	0.08	0.01	0.52	109	0.1	0.08	0	0.52
ROA	22	7.49	4.84	0.35	19.58	118	8.05	5.67	0.07	27.38	140	7.96	5.53	0.07	27.38
PE Ratio	15	5.37	75.74	-180	137	107	7.48	26.65	-111.1	137	122	7.22	35.87	-180	137
EBIT	15	2481.57	3823.5	-81.2	12606.2	108	5197.45	19373.37	-634.7	192317	123	4866.25	18211.38	-634.7	192317
Credit Rating	377	9.95	0.66	1	10	641	9.82	1.09	1	10	1018	9.87	0.95	1	10

Notes: domestic refers to the domestic syndicated loan defined as those loans when all lead arrangers of a syndicated loan are from China. Foreign refers to the foreign syndicated loan defined as those loans when at least one lead arranger of a syndicated loan is from foreign country.

**Table 2: Effect of the financial crisis on the syndicated loan spread**

	Loan Spread			
	1	2	3	4
Crisis	-39.37 [-0.63]	-47.07 [-0.69]	53.13 [1.05]	52.72 [0.78]
Foreign	18.10 [1.59]	-18.40 [-0.51]	5.70*** [19.64]	3.60* [2.48]
Foreign*Crisis	-1.69 [-1.56]	-2.67** [-3.27]	-1.49* [-3.54]	-5.43*** [-2.96]
Follow Up10			4.82 [2.18]	3.56 [1.78]
Follow Up11			9.30* [2.65]	5.01* [2.48]
Follow Up12			12.60*** [17.56]	32.51*** [9.65]
Loan maturity		-7.30 [-0.61]		-6.22 [-0.81]
Number of lead arrangers		7.33 [0.71]		0.61 [0.13]
Share of lead arrangers (%)		-1.14 [-1.24]		0.08 [0.10]
Firm level controls	Yes	Yes	Yes	Yes
Constant	73.50 [1.51]	81.50** [3.69]	-23.70 [-1.47]	-12.60 [-0.86]
Observations	139	139	139	139
Adj. R <sup>2</sup>	0.08	0.20	0.67	0.63

Notes: Robust t-statistics are in parentheses. The standard errors are obtained using clustering on industry as explained in the methodology. \*, \*\* and \*\*\* represent coefficients significant at the 5%, 1% and 0.1% respectively. Models are estimated with firm fixed effect. In all models, firm level controls, such as firm size, financial leverage, profitability and price-earnings ratio (in one year lag) and firm age, Moody's credit rating are included.

**Table 3: Effect of the financial crisis on the syndicated loan amount**

	Loan Amount			
	1	2	3	4
Crisis	17.81** [4.04]	12.43* [2.62]	20.72** [3.50]	15.29* [2.45]
Foreign	-2.81* [-2.21]	-5.96 [-1.32]	-3.97 [-1.57]	-5.53** [-2.36]
Foreign*Crisis	-27.53** [-3.95]	-18.92* [-2.72]	-28.87** [-3.37]	-19.60* [-2.61]
Follow Up10			57.63 [2.07]	-16.92 [-0.82]
Follow Up11			23.41** [3.12]	-11.29 [-0.96]
Follow Up12			40.61 [1.47]	82.74 [0.42]
Maturity		5.73 [0.26]		1.43 [0.07]
Number of lead arrangers		47.68* [2.03]		45.69* [2.11]
Share of lead arrangers (%)		0.62 [0.37]		0.69 [0.32]
Firm level controls	Yes	Yes	Yes	Yes
Constant	-17.34 [-0.09]	21.41 [1.03]	-14.99 [-0.80]	19.83 [1.17]
Observations	102	94	102	94
Adj. R <sup>2</sup>	0.17	0.38	0.25	0.38

Notes: Robust t-statistics are in parentheses. The standard errors are obtained using clustering on industry as explained in the methodology. \*, \*\* and \*\*\* represent coefficients significant at the 5%, 1% and 0.1% respectively. Models are estimated with firm fixed effect. In all models, firm level controls, such as firm size, financial leverage, profitability and price-earnings ratio (in one year lag) and firm age, Moody's credit rating are included.

**Table 4: Effect of the financial crisis on the syndicated loan maturity**

	Loan Maturity			
	1	2	3	4
Crisis	-2.37 [-0.74]	-3.49 [-0.58]	-3.64*** [-4.15]	-3.72 [-0.62]
Foreign	-2.71 [-0.82]	-1.90 [-0.65]	-2.92* [-1.93]	-2.37* [-3.87]
Foreign*Crisis	0.28 [0.11]	1.51** [4.26]	2.51* [2.18]	1.92** [5.16]
Follow Up10			-2.42 [-1.17]	-2.06 [-1.02]
Follow Up11			-2.62 [-1.53]	-2.11 [-1.14]
Follow Up12			0.19 [0.13]	0.96** [2.65]
Loan amount		0.05 [0.24]		0.02 [0.07]
Number of lead arrangers		-0.08 [-0.52]		-0.05 [-0.31]
Share of lead arrangers (%)		0.02 [1.98]		0.04 [1.63]
Firm level controls	Yes	Yes	Yes	Yes
Constant	-7.35 [-0.88]	-7.86 [-0.87]	-2.48 [-0.23]	-4.26 [-0.38]
Observations	94	94	94	94
Adj. R <sup>2</sup>	0.20	0.19	0.21	0.20

Notes: Robust t-statistics are in parentheses. The standard errors are obtained using clustering on industry as explained in the methodology. \*, \*\* and \*\*\* represent coefficients significant at the 5%, 1% and 0.1% respectively. Models are estimated with firm fixed effect. In all models, firm level controls, such as firm size, financial leverage, profitability and price-earnings ratio (in one year lag) and firm age, Moody's credit rating are included.

**Table 5: Effect of the financial crisis on the number of lead arrangers in syndicated loans**

	Number of Lead Arrangers			
	1	2	3	4
Crisis	-0.13 [-0.09]	-1.24 [-0.52]	1.02 [1.02]	0.32 [0.18]
Foreign	0.95 [0.67]	0.31 [0.43]	0.63* [0.48]	0.47 [0.68]
Foreign*Crisis	0.35 [0.20]	0.27** [2.10]	0.56* [2.39]	0.53** [3.24]
Follow Up10			0.93 [1.01]	1.49 [1.30]
Follow Up11			1.63 [1.61]	0.92 [0.88]
Follow Up12			3.28 [1.49]	2.54* [2.75]
Loan maturity		-0.02 [-0.55]		-0.01 [-0.32]
Loan Amount		0.11 [1.74]		0.10 [1.83]
Share of lead arrangers (%)		-0.04*** [-4.66]		-0.05*** [-5.92]
Firm level controls				
Constant	9.49* [2.37]	9.57** [4.12]	4.70 [1.78]	4.33 [1.54]
Observations	102	94	102	94
Adj. R <sup>2</sup>	0.01	0.41	0.07	0.44

Notes: Robust t-statistics are in parentheses. The standard errors are obtained using clustering on industry as explained in the methodology. \*, \*\* and \*\*\* represent coefficients significant at the 5%, 1% and 0.1% respectively. Models are estimated with firm fixed effect. In all models, firm level controls, such as firm size, financial leverage, profitability and price-earnings ratio (in one year lag) and firm age, Moody's credit rating are included.

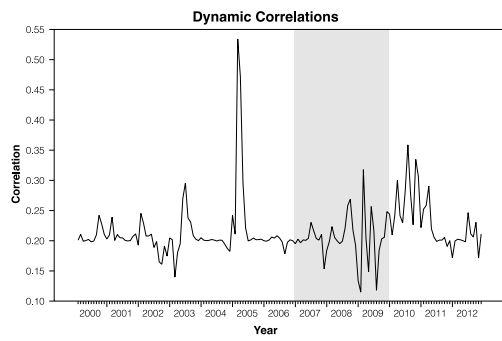


Figure 1: Foreign syndicated loan amount and spread

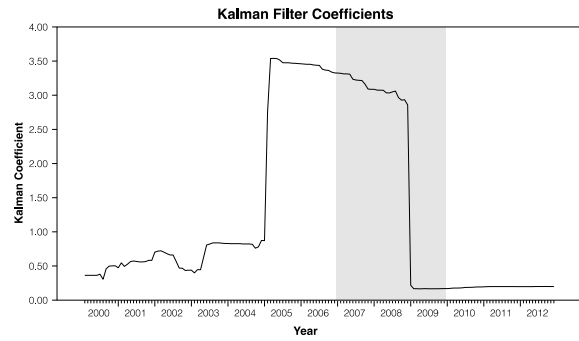


Figure 2: Kalman estimates on correlation of foreign syndicated loan amount and loan spread

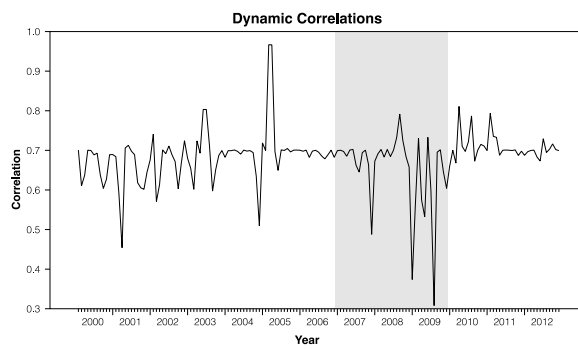


Figure 3: Foreign syndicated loan maturity and spread

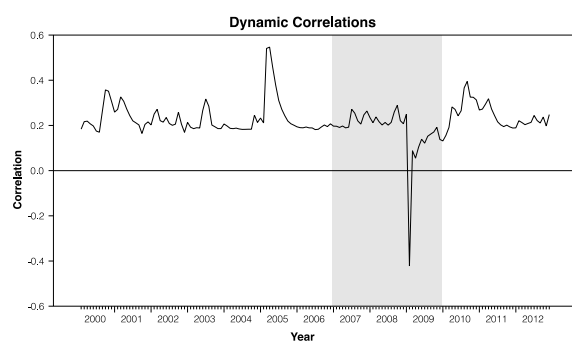


Figure 4: Foreign syndicated loan amount and maturity

**Table 6: Diagnostic test results**

	<b>Foreign Syndicated Loan</b>			<b>Domestic Syndicated Loan</b>		
	Amount	Spread	Maturity	Amount	Spread	Maturity
Ljung-Box Q(40)*	13.77	13.56	49.99	5.70	8.77	13.21
Augmented DF Test*	-2.47	-3.61	-2.68	-2.55	-1.90	-2.88
Zivot-Andrews* <sup>a</sup>	-10.51	-10.61	-5.24	-6.44	-8.54	-6.93
ARCH (p) LM Test*	28.66	18.46	12.87	0.65	5.57	21.59

Note: For foreign syndicated loans ARCH (15) and for domestic syndicated loans ARCH (10) LM test are done, because of differences in sample size. \* Denotes significance at 5% level.

<sup>a</sup>The estimated structural breaks (Month, Year) for variables are as follows: foreign syndicated loan amount (February, 2011), spread (September, 2006), maturity (August, 2006) and domestic syndicated loan amount (August, 2009), spread (April, 2012), maturity (March, 2011).

**Table 7: DCC-GARCH model for the relationship between syndicated loan terms**

	Foreign Syndicated Loan			Domestic Syndicated Loan		
	A	B	C	A	B	C
$\gamma_i$	77.98 [22.36]	97.52 [9.32]	51.74 [5.96]	84.13 [4.97]	57.87 [2.91]	93.81 [7.10]
$\alpha_i$	0.07 [4.18]	0.47 [19.26]	0.08 [4.97]	-0.01* [-0.06]	0.45 [11.90]	0.05* [1.28]
$\beta_{i1}$	0.11 [4.81]	0.61 [12.95]	0.10 [2.50]	-0.04* [-0.39]	-0.46 [-6.12]	0.20 [2.78]
$\beta_{i2}$	0.13 [4.79]	0.31 [15.19]	0.07* [1.01]	-0.08* [-1.17]	-0.40* [0.00]	0.17* [1.57]
$\delta_i$	-0.11 [-5.36]	0.29 [13.74]	-0.10 [-4.77]	0.07* [0.43]	0.06 [2.27]	-0.11* [-1.11]
$\gamma_j$	61.72 [15.98]	13.41 [28.48]	5.26 [5.44]	67.13* [-0.06]	25.87* [1.70]	83.75 [4.11]
$\alpha_j$	0.16 [11.39]	0.41 [27.29]	0.10 [2.36]	67.13 [7.78]	-0.01* [-0.11]	0.07* [0.86]
$\beta_{j1}$	0.11* [0.11]	0.64 [13.83]	0.11* [1.63]	0.38 [12.82]	0.60 [11.01]	0.20 [2.80]
$\beta_{j2}$	0.13 [4.79]	0.31 [14.95]	0.11* [1.63]	-0.03* [-0.34]	-0.84 [-3.69]	0.17* [1.58]
$\delta_j$	-0.10 [-2.62]	0.11 [87.78]	-0.14 [-4.96]	-0.19 [-20.51]	0.05* [0.38]	0.03* [0.14]
$a_m$	0.26 [7.36]	0.82 [16.95]	0.28* [1.55]	0.08* [0.53]	0.08* [0.52]	0.14* [0.46]
$b_n$	0.74 [22.26]	0.22 [146.10]	0.35* [0.86]	0.75 [4.85]	0.66* [1.18]	0.00* [0.00]

Notes: T-statistics are in parentheses. \* indicates statistically insignificance. All other parameters are statistically significant. For definition of the above parameters on the extreme left column of Table xxx, refer to Equation (3) and (4).

Estimation results of the DCC (1,1) model for the following relationships:

Column A: Loan Spread (i) – Loan Amount (j);

Column B: Loan Maturity (i) – Loan Spread (j);

Column C: Loan Amount (i) – Loan Maturity (j).



**Table 8: Robustness tests**

	Panel A				Panel B			
	Loan Amount	Loan Maturity	Loan Spread	No. of Lead Arrangers	Loan Amount	Loan Maturity	Loan Spread	No. of Lead Arrangers
Crisis	5.10*	-2.59	59.41	0.94*	15.2*	-3.71	52.72	0.32
	[2.35]	[-0.45]	[0.79]	[2.66]	[2.45]	[-0.62]	[0.78]	[0.18]
Foreign	-0.84**	1.97	7.35**	0.60	-0.52	-2.39	3.61*	0.47
	[-3.40]	[1.67]	[2.03]	[0.76]	[-1.36]	[-0.87]	[2.48]	[0.68]
Foreign*Crisis	-9.46*	0.46**	-3.95**	1.29*	-19.6*	0.92***	-9.34**	0.52
	[-2.48]	[3.08]	[-4.22]	[3.77]	[-2.61]	[4.16]	[-4.24]	[1.24]
Follow Up10	-2.55	-1.651	83.17	1.65	-16.92	-2.06	3.56*	1.45
	[-0.88]	[-0.73]	[1.86]	[1.31]	[-0.82]	[-1.02]	[2.78]	[1.30]
Follow Up11	-2.92	-2.54	19.4*	0.48	-12.9	-2.11*	5.04*	0.92
	[-0.76]	[-1.28]	[2.32]	[0.56]	[-0.96]	[-3.14]	[2.48]	[0.88]
Follow Up12	3.81	1.385	9.74***	2.62*	2.17**	0.95	8.52***	2.54*
	[-0.37]	[1.09]	[9.82]	[2.82]	[5.42]	[0.65]	[9.65]	[2.75]
Loan Amount		0.22		0.10		0.13		0.16
		[0.12]		[1.94]		[0.07]		[1.83]
Loan Maturity	2.49		-6.24	-0.04	1.43		-6.22	-0.31
	[1.13]		[-0.74]	[-1.36]	[0.07]		[0.81]	[-0.32]
No. of Lead Arrangers	0.95	-0.18	1.48		45.69	[-0.05]	0.61	
	[1.97]	[-1.19]	[0.29]		[2.11]	[-0.31]	[0.13]	
Share of Lead arrangers	0.82	0.01	0.10	-0.08***	0.60*	0.01	0.07	-0.07***
	[0.38]	[1.31]	[0.13]	[-5.51]	[2.32]	[1.63]	[0.12]	[-5.92]
Firm level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	17.14**	-4.72	-95.18*	3.56	9.85*	-4.23	-12.6	4.35
	[2.23]	[-0.43]	[-3.67]	[1.25]	[3.17]	[-0.38]	[-0.86]	[1.54]
Observations	87	87	37	87	94	94	39	94
Adjusted R-sq	0.37	0.21	0.62	0.48	0.38	0.19	0.63	0.44

Notes: In Panel A, we exclude those borrowers, which have highest market capitalization (top 25 percent). In Panel B, we exclude all the firms that have Moody's rating Aa2, A2 and A3. \*, \*\* and \*\*\* represent coefficients significant at the 5%, 1% and 0.1% respectively. Models are estimated by clustering at the industry level with block bootstrapping standard errors. In all models, firm level controls, such as firm size, financial leverage, profitability and price-earnings ratio (in one year lag) and firm age are included.