BOFIT Discussion Papers
18 • 2019

Sris Chatterjee, Xian Gu, Iftekhar Hasan and Haitian Lu

Ownership structure and the cost of debt: Evidence from the Chinese corporate bond market

BOFIT
THE BANK OF FINLAND
INSTITUTE FOR ECONOMIES
IN TRANSITION

BOFIT Discussion Papers
Editor-in-Chief Zuzana Fungáčová

BOFIT Discussion Papers 18/2019
19.9.2019

Sris Chatterjee, Xian Gu, Iftekhar Hasan and Haitian Lu: Ownership structure and the cost of debt: Evidence from the Chinese corporate bond market

ISBN 978-952-323-297-6, online
ISSN 1456-5889, online

Suomen Pankki
Helsinki 2019

Contents

Sris Chatterjee, Xian Gu, Iftekhar Hasan and Haitian Lu

Ownership structure and the cost of debt: Evidence from the Chinese corporate bond market

Abstract

Drawing upon evidence from the Chinese corporate bond market, we study how ownership structure affects the cost of debt for firms. Our results show that state, institutional and foreign ownership formats reduce the cost of debt for firms. The benefits of state ownership are accentuated when the issuer is headquartered in a province with highly developed market institutions, operates in an industry less dominated by the state or during the period after the 2012 anti-corruption reforms. Institutional ownership provides the most benefits in environments with lower levels of marketization, especially for firms with low credit quality. Our evidence sheds light on the nexus of ownership and debt cost in a political economy where state and private firms face productivity and credit frictions. It is also illustrative of how the market environment interacts with corporate ownership in affecting the cost of bond issuance.

Keywords: Government ownership, institutional holding, credit spreads, market forces
JEL Code: G12, G18, G32, G34

Sris Chatterjee, orcid.org/0000-0002-3388-3618. Gabelli School of Business, Fordham University. E-mail: Chatterjee@fordham.edu.

Xian Gu, orcid.org/0000-0003-1409-7838. Wharton School and Central University of Finance and Economics. E-mail: xiangu@wharton.upenn.edu.

Iftekhar Hasan, orcid.org/0000-0003-2469-0539. Fordham University and Bank of Finland, 45 Columbus Avenue, 5th Floor, New York, NY 10023. E-mail: ihasan@fordham.edu. Phone: +1 646 312 8278.

Haitian Lu, orcid.org/0000-0002-7627-2454. The Hong Kong Polytechnic University. E-mail: haitian.lu@polyu.edu.hk.

1 Introduction

The nexus between corporate ownership and the cost of debt has been investigated extensively from both theoretical and empirical perspectives. Ownership and control frames agency conflicts, determines borrowing costs on debt markets and affects firm value. Earlier cross-country studies establish that a firm's ownership identity and its institutional environment matter with respect to borrowing costs. For example, government equity ownership of a publicly traded firm is associated with higher cost of debt due to state-induced distortions, but a lower cost of debt during financial crisis or when the firm otherwise faces financial distress (Borisova et al., 2015). In the case of partial privatizations, the reduction in government ownership boosts the cost of debt, revealing the cost of reduced government guarantees (Borisova and Megginson, 2011). While institutional ownership helps reduce the cost of debt through improved monitoring and governance, highly concentrated outside institutional ownership may use undue influence for its own benefit in ways that increase the cost of debt (Bhojraj and Sengupta, 2003). Finally, in environments with strong legal and market institutional settings, lenders are more willing to provide credit at favorable terms in private debt market (Qian and Strahan, 2007).

This paper advances the discussion of the nexus of ownership and debt cost on two fronts. First, we provide an empirical assessment of the Chinese bond market as to how corporate ownership structure affects the cost of debt in a political economy where heterogeneous firms face productivity and credit frictions. The endogeneity of home-country institutions constitutes a major empirical challenge for cross-country studies of corporate ownership and the cost of debt. We alleviate this concern by focusing solely on firms in China, where the state-owned sector of the world's largest emerging economy still dominates, but role of privately owned firms in the economic growth model has increased in recent decades. State and private firms in China differ in two important respects: productivity and access to external capital. State firms have lower productivity, but enjoy better access to external credit. Private firms enjoy higher productivity, but face financial challenges that force them to rely on retained earnings to finance operation and investment (Song, Storesletten and Zilibotti, 2011). China's capital market has been greatly vitalized in recent decades through regulatory reforms such as privatization of state firms, the unlocking of restricted state-owned shares and improvements in market access for domestic and foreign institutional investors (Carpenter, Lu and Whitelaw, 2015).[1]

[1] For domestic institutional investors, we consider insurance firms, financial firms, supplementary pensions, securities firms, social insurance funds, trust firms and mutual funds. This approach is consistent with prior studies (e.g. Jiang and Kim, 2015).

Second, we investigate how the market environment in which firms operate affects the identified dynamics of the nexus of ownership and debt cost. The extent to which a more sophisticated market environment, characterized by strong rule of law and vibrant market competition, imposes discipline on managers is well studied. We consider the less-explored issue of the market environment's *net* impact on lender evaluation of firms with heterogeneous ownership structures. China provides an ideal natural laboratory for such as study as it offers heterogeneous market-supporting institutions across 31 provinces and different levels of state control across many industries.

This allows us to consider empirically how bond investors respond to government, institutional and foreign ownership, as well as the degree of response varies with issuers operating in markets with differing levels of sophistication. We focus on the corporate bond market because bond issuers are publicly traded companies, and thus required by the law to disclose their ownership structures and changes. Bonds also contain multi-dimensional contractual features such as rating score, call options and collateral requirements not found in the private loan market. Changes in these features help in study of bondholder reactions to ownership structure changes.

The impact of state ownership on the cost of debt depends on how lenders value the costs and benefits of state ownership with respect to a firm's credit risk (Borisova et al., 2015). On one hand, having the state as residual claimer may provide an implicit guarantee to debtholders against default on repayment, especially in a crisis. This lowers the cost of debt (Borisova and Megginson, 2011). On the other hand, government ownership is often associated with state-induced distortion and inefficiencies (Aharoni, 1986; La Porta and Lopez-de-Silanes, 1999; Toninelli, 2000) that can affect performance, and thereby increase the firm's cost of debt. Moreover, moral hazard issues associated with state ownership can reward managers to risky behavior (Boubakri, Cosset and Saffar, 2013) or encourage managers to pursue personal political objectives at the expense of debtholders. This increases the cost of debt. The net impact of government ownership on the cost of debt is thus also an empirical question.

The impact of institutional ownership on the cost of debt warrants deliberation. Recent literature suggests that firms that attract a larger number of institutional equity investors have narrower credit spreads and better credit ratings. This is likely due to the fact that institutional investors have stronger incentive and better skills with which to monitor management and develop corporate governance (e.g. Ashbaugh et al., 2006). The other channel for institutional ownership to reduce the cost of debt is through improved information environment of the firm. For example, active trading by institutional (including foreign) investors may expedite information revelation, thereby reducing information asymmetry between firm and lender (Wang and Zhang, 2009). However, the strength

of institutional investor governance depends on the size of their equity holding and monitoring capabilities. This correlates with the firm's ownership structure (Barclay and Holderness, 1989; Bhojraj and Sengupta, 2003).

The market environment in which firms operate has a profound impact on their cost of debt. As Qian and Strahan (2007) show, in the presence of robust legal and market institutions, lenders are better positioned to force repayment or take control of a firm in the event of default, and therefore more willing to provide credit at favorable terms (lower spreads, longer maturities) ex ante. In this paper, we ask how the market environment affects the role of state and institutional ownership on the firm's cost of debt. A highly developed market environment can both discipline state-induced inefficiencies and reduce the value of the state's implicit guarantee. However, as theoretical prediction of which effect dominates is difficult, we consider the matter from an empirical standpoint. We expect the market environment to affect lender evaluations of the roles played by institutional investors. A high level of marketization helps discipline managers, thus reducing lender reliance on institutional monitoring.

We investigate these questions using a complete dataset that cover all the corporate bonds issued by listed firms since the launch of Chinese exchange bond market in 2007 to the end of 2015. We then match bond data with ownership structure data and other characteristics of bond issuers. To explore the role of marketization levels, we separate issuers into those headquartered regions with high levels of marketization (high-marketized) and low levels of marketization (low-marketized) based on the Chinese provincial level marketization index developed by Fan et al. (2011, 2017). We also separate those operating in highly competitive (high competition) and low competition environments based on the level of state-owned assets in their industries.

Our investigation shows that higher levels of state ownership are strongly associated with lower credit spreads. Ceteris paribus, the credit spreads of the bonds issued by state firms are 23.4% lower than those of private firms. This result is consistent with the productivity-credit frictions in a growth model of political economy. It suggests lenders consider the benefit of state implicit guarantee to outweigh the cost of state-induced inefficiencies. Further evidence shows the *strength* of state ownership matters. Issuers owned by the *central* government or with a larger government-owned stake have even narrower credit spreads.

We find foreign and institutional ownership help in lowering the issuer's bond cost. Ceteris paribus, cross-listing in both domestic (A-share) and Hong Kong (H-share) markets translates into a 9.2% decrease in the bond cost. A 10% increase in institutional ownership reduces bond spreads by about 1.6%. Consistent with the institutional monitoring hypothesis, the impact of institutional and foreign ownership in lowering the bond spread is more pronounced for issuers with lower bond ratings, smaller issuance volumes and shorter maturities.

To test how the market environment affects the role of state ownership on the cost of debt, we assume that lenders consider the value of the market environment in disciplining state-induced inefficiencies to outweigh the cost of reduction in the state's implicit guarantee. If so, we should find the negative effect of state ownership on spreads to be more pronounced in environments with high levels of marketization. Three pieces of evidence support this hypothesis. First, the negative association between state ownership and spread is more pronounced for firms headquartered in highly marketized provinces. Second, the negative association between state ownership and spread is more pronounced for firms whose industries are less dominated by state assets. Third, treating the launch of the Communist Party of China's 2012 anti-corruption initiative (based on the Eight-Point Regulation adopted by the Politburo in December 2012) as an exogenous shock, we show the cost of debt for state firms fell significantly in the post-regulation period, especially in highly marketized regions. Taken together, our results suggest lenders consider the market environment as a factor in reducing the cost of debt of state firms more than that of private firms.

To see how market environment affects the role of institutional ownership, we partition our sample into issuers headquartered in high- or low-marketized provinces. We find the effect of institutional ownership in lowering spread is only significant for issuers headquartered in low-marketized provinces. The result is consistent with lenders considering the governance role of institutional investors to be important when the market environment for firms is weak.

This paper contributes to the literature on ownership structure and cost of debt. Prior work tends to focus on a single type of ownership structure such as ownership concentration, divergence between control and cash-flow rights, or identity of the controlling shareholder. For example, Aslan and Kumar (2012) analyze theoretically and empirically the endogeneity of corporate control concentration and the cost of debt. Using cross-country data, Lin et al. (2011) document that the cost of debt is significantly higher for companies with a higher wedge of the largest ultimate owners' control rights and cash-flow rights created by potential tunneling and moral hazard issues. Using evidence from privatization, Borisova and Meggionson (2011) document a quadratic relationship between credit spreads and government ownership that they attribute to four mechanisms: government guarantee, better performance, ownership uncertainty surrounding privatization and bond-shareholder conflicts. Furthermore, Boisova et al. (2015), using a sample of bond credit spreads from 43 countries, find that government ownership is generally associated with a higher cost of debt during normal periods, but a lower cost of debt during periods of crisis. We add to this literature the first empirical evidence from Chinese corporate bond market. We show in an environment where heterogeneous ownership structure firms face productivity and credit frictions, strength of government ownership, institutional equity holdings and foreign listing all help reduce firms' cost of debt.

More importantly, we shed light on how the market environment interacts with the role of state and institutional ownership on the cost of debt for firms. We show that highly marketized environments in the home province of the issuer and higher product market competition *complement* the role of state ownership, but *substitute* the role of institutional ownership in reducing the cost of debt. This evidence suggests lenders see the benefits of the market environment in reducing state-induced inefficiencies as outweighing the cost of a reduced state implicit guarantee. Similarly, the governance role of institutional ownership in reducing credit risk matters more in low-marketized environments.

The rest of the paper is organized as follows. Section 2 introduces the institutional background of Chinese corporate bond market, as well as recent trends in the Chinese stock market. Section 3 describes our sample and variables. Section 4 presents the empirical results. Section 5 concludes.

2 Institutional background

While the emergence of China's private bond market began decades ago, its growth only took off in the late 2000s with the launch of an exchange-based corporate bond market supervised by the Chinese Securities Regulatory Commission (CSRC). World Bank statistics show that China's corporate bond issuance volume as a percentage of GDP was 6.1% in 2014 and 5.5% in 2015, making China first in the world by this measure, beating out both the US and the UK (Figure 1). At the end of 2016, the capitalization of China's domestic bond market climbed to RMB 50.8 trillion ($7.65 trillion), outstripping the value of the domestic equity market, which was RMB 44.3 trillion ($6.67 trillion).[2] Amstad and He (2019) review the development of Chinese bond market and interbank market.

Like its US counterpart, China's bond market has several major bond categories: government bonds, central bank bills, financial institution bonds, commercial paper and non-financial corporate bonds. The non-financial corporate bonds have a section for enterprise bonds traded on the interbank bond market and a section for corporate bonds traded in the exchange market. These two markets have long been subject to their own distinct regulatory systems. The issuance of enterprise bonds, predominantly by state-owned enterprises, is approved by the National Development and Reform Commission (NDRC) and the People's Bank of China, while corporate bonds are approved and regulated by the CSRC. The procedure for issuing corporate bonds in China is similar to that of an IPO. The 2007 pilot rules for issuance of corporate bonds (CSRC Order No. 49) require each

[2] Here we use the 2016 annual average RMB exchange rate of 6.64.

corporate bond obtain a relatively high credit rating (AA- or above) from an approved rating agency such as China Credit Rating. Before 2015, only listed A-share firms were allowed to publicly issue corporate bonds in the exchange market. The corporate bond issuance reform at the beginning of 2015 changed the situation, allowing unlisted firms with high credit ratings to issue bonds in this market.

We focus on corporate bonds issued by listed firms operating in the exchange market for two reasons. First, while the interbank bond market is dominated by SOEs and unlisted firms, both SOEs and non-SOEs participate in this market. Second, corporate bonds issued by listed firms allows us to trace the evolution of ownership structures, including the institutional and foreign ownership of issuers.

The institutional participation in China's stock market increased steadily over the past decade. Moreover, since China's entry to WTO in 2001, the mutual fund industry has blossomed. The Qualified Foreign Institutional Investor (QFII) Act announced in 2002 allows the foreign investors to invest in Chinese securities, with the intention of introducing sophisticated foreign investors to the Chinese market with the hope that their presence would improve market efficiency and corporate governance for the listed companies. The first fund managed by a qualified foreign institutional investor (QFII), regulated by the State Administration of Foreign Exchange (SAFE), was set up in 2002. In the initial stage of development from 2002 to 2006, the participation of QFII in A- shares was limited due to a strictly regulated QFII quota. In August 2006, the CSRC revised the QFII rules, increasing the quota significantly. The aggregate quota granted to all QFIIs was raised from $10 billion in 2003 to $150 billion in 2015.

Chinese listed companies also gain foreign owners through cross-listing in a foreign stock market. Since the 1990s, Hong Kong has become an important fund-raising platform for Chinese firms (Sun, Tong and Wu, 2013). As of 2015, 194 Chinese enterprises had listed their H-shares on the Hong Kong Stock Exchange. Unlike domestic firms, cross-listed firms must comply with the regulatory requirements of both their home and host markets. This can affect the firm's information environment and corporate governance, especially if the foreign market has stronger legal and financial institutions (Reese and Weisback, 2002; Doidge et al., 2004).

3 Data and variables

3.1 Our sample

We begin our sample construction process with the combined datasets on Chinese corporate bonds and bond issuers from two of China's leading financial market research databases, Wind and iFind. Wind contains detailed information on bond issuance such as yield, maturity, volume, rating, collateral and other factors. We then match bond issuance data with ownership characteristics and financial information of bond issuers, extracted from iFind. The bond issuance data in year *t* are matched with firm's financial data in year *t-1*. We only keep corporate bonds issued by listed companies as such bonds include detailed information on ownership structure. Bonds issued by financial and utility firms are excluded from our sample.

While most issues in our sample have only issued one bond, some have issued multiple bonds. Following the literature (e.g. Klein and Zur, 2011), we do not aggregate the multiple bonds together at the firm level, but treat each bond as an observation. As some firms issuing multiple bonds have different levels of institutional holding, we can use this setting to examine the effect of institutional holding on the cost of bond financing of the same issuer. An aggregated firm-level approach, in contrast, would not permit us to examine the effect of the institutional holding on bond properties of the same issuers before and after changes of institutional ownership. In this way, we end up with a bond-level samples with detailed ownership structure information that covers 630 corporate bonds issued by 136 listed firms from 2007 to 2015.

3.2 Bond characteristics

Our main dependent variable is *At-issue bond yield spread*, defined as the difference between the at-issue bond yield and a 5-year treasury bond yield matched to the month of corporate bond issuance.[3] (See Appendix A for a detailed description of all the variables.) The summary statistics for our bond sample presented in Table 1 indicates substantial heterogeneity. *At-issue bond yield* ranges from 3.30% to 9.20%, with a sample mean of 6.05%. Subtracting the monthly averaged 5-year treasury bond yield, the *bond spread* ranges from 0.31% to 5.83% with a sample mean of 2.75% and a standard deviation of 1.13%.

We also consider other bond characteristics, including bond rating, bond maturity, issuance volume, call options and collateral. *Maturity* ranges from 1.0 year to 15.0 years, with a sample mean

[3] We match the corporate bond yield at issuance with a five-year treasury bond yield as the average maturity of corporate bond in our sample is 5.4 years.

of 5.42 years and a standard deviation of 1.86 years. *Issuance vol.* ranges from 0.05bn RMB to 16.0bn RMB, with a sample mean of 1.30bn RMB. *Callable*, which equals one if the bond is callable and zero otherwise, has a sample mean of 0.73, indicating that majority corporate bonds have call options. *Collateral* equals one if the bond has collaterals at issuance or zero otherwise, with a sample mean of 0.40. *Bond rating score* is the numeric score of the bond rating at issuance, e.g. 6 for AAA+, 5 for AAA and so on. *Issuer rating score* is the numeric score of the issuer rating at issuance, e.g. 6 for AAA+, 5 for AAA and so on. *Bond rating score* ranges from 3.0 to 6.0 and Issuer rating score ranges from 1.0 to 6.0.

3.3 Bond issuer characteristics

At the bond-issuer level, we examine the ownership structure and consider an assortment of firm characteristics. *Institutional_holding_perc* is the percentage ratio of the institutional equity ownership ranging from 0 to 98%, with a sample mean of 49% and a standard deviation of 24%. *HA* is a dummy that equals one if the bond issuer is listed both on the H-share (Hong Kong) and A-share (mainland China) markets. The sample mean of HA is 0.10, suggesting that 10% of corporate bonds are issued by the firms listed both in Hong Kong and mainland China. *QFII_dummy* equals one if the firm has foreign ownership. It has a sample mean of 0.13, indicating that only a small fraction of corporate bonds is issued by firms with foreign ownership. As the RMB is not completely convertible, stocks traded on the A-share market can only be bought or sold by foreign investors approved by the CSRS (i.e. qualified foreign institutional investors (QFIIs) subject to a quota.

We use different variables to measure government ownership. *SOE* equals one if the government is the controlling shareholder of the firm and zero otherwise. *CentralSOE* equals one if the central government is the controlling shareholder and zero otherwise. *LocalSOE* equals one if the local government is the controlling shareholder and zero otherwise. *MajorSOE* equals one if the percentage of state-ownership is above the median level for SOEs. *MinorSOE* equals one if the percentage of state-ownership is below the mean level for SOEs. 48% of corporate bonds in our sample are issued by SOEs (15% by central SOEs and 33% by local SOEs).

We also control for other firm-level traits. *Firmage*, the logarithm of the number of years since establishment, ranges from 0.69 to 3.47. *Profitability*, the ratio of net profit to total assets, ranges from -0.10 to 0.27. To measure firm risk, we apply a modified Altman's (1968) Zscore, sum of weighted working capital, retained earnings, EBIT and total sales. The variable *Zscore* ranges from -0.02 to 6.28, with a sample mean of 1.22 and a standard deviation of 0.71. *CFrights*, defined as the cash-flow rights of the largest ultimate owner of the bond issuer, varies from 0.01 to 0.89.

Wedge is defined as the difference between the control rights and cash-flow rights of the largest ultimate owner of the bond issuer, with a sample mean of 0.18.

3.4 Regional and industrial traits

To measure the strength of market supporting institutions, we use the provincial-level marketization index and retrieve the information from the survey constructed by the National Economic Research Institute (NERI). Provincial-level municipalities, including Beijing, Shanghai, Tianjin and Chongqing, are counted as provinces in this dataset (see Fan et al., 2011 and 2017). The original marketization index, which ranges from zero to ten in our base year 2001, is constructed from official statistics and a selection of household and enterprise surveys. Fan et al. (2017) update the index in the base year 2008, so we merge the indices after adjusting the base year to get an index running from 1997 to 2015. This index is widely used as a meaningful measure of the progress of pro-market reforms in China. A higher value indicates greater progress towards a market economy (e.g. Lin et al, 2016). We also consider the economic development of the bond-issuer provinces using the log of GDP.

In order to measure the state dominance in a particular industry, we use the ratio of total assets owned by SOEs over the total assets in the industry from 2007 to 2015. Based on this, we define the variable *High_statedom* as one if the value of state-dominance exceeds the median and zero otherwise. In this way, we are able to identify industries with high or low levels of government involvement.

4 Methodology, results and robustness tests

4.1 Methodology and baseline results

We examine the effect of ownership structure on the at-issue bond yield spread with the following baseline model, controlling for the firm-, bond- and region-specific measures defined above.

$$Spread_{i,t} = \beta_0 + \beta_1 \cdot (Ownership\ variables)_{i,t} + \beta_2 \cdot (Bond\ characteristics)_{i,t} + \beta_3 \cdot (Firm\ characteristics)_{i,t} + \beta_4 \cdot (Year\ Dumm)_{i,t} + \beta_5 \cdot (Ind\ dumm)_{i,t} + \varepsilon \quad (1)$$

where bond characteristics include collateral, callable and bond rating score, as well as ownership traits such as state ownership, institutional ownership, foreign ownership, and whether the bond

issuer is listed on multiple markets. Other firm characteristics include firm age, Zscore and profitability. Regional traits such as log of GDP are also considered. *Year dumm* and *ind dumm* represent for year and industry fixed effects.

Table 2 presents our baseline results. We introduce the ownership variables on state ownership, institutional holding, foreign ownership and whether the bond issuer is listed on multiple markets individually in columns (1) to (4), and together in column (5). The results show that *SOE*, *institutional_holding_perc* and *HA* all enter significantly and negatively. *QFII_dummy* enters negatively, but less significantly, in all the regressions, suggesting that government and institutional ownership significantly reduce the cost of capital through issuing corporate bonds, and if the bond issuer is listed on multiple markets rather than just one market (A-share or H-share), the cost of bond financing is lower. The estimated coefficients suggest that this relationship is economically meaningful. Ceteris paribus, if the bonds are issued by SOEs, then the yield spreads would be 23.4% (0.645/2.75) lower. If the bonds are issued by a firm also listed on the H-share market, the spreads would be 9.2% (0.254/2.75) lower than that of a firm only listed on the A-share market. Moreover, a 10% increase in the institutional ownership reduces bond spreads by about 1.6% (0.0448/2.75). As expected, the spread is negatively associated with *bond rating score*, *firm age* and *profitability*. *Collateral* enters with a significant and positive sign because only riskier firms are required to provide collateral. Less riskier firms (e.g. firms with an implicit guarantee from the government) do not.

Next, we split our sample into groups based on the bond rating, issuance volume and maturity. Recent literature documents a link between institutional equity ownership and cost of debt through a corporate governance mechanism that could mitigate agency conflicts and reduce information asymmetry. Moreover, firms with low credit quality face stronger agency conflicts between debt-holders and equity-holders than companies with impeccable credit quality (e.g. Jensen and Meckling, 1976; Myers, 1977). Hence, we expect that the effect of institutional holding would be stronger in firms with stronger agency conflicts and accordingly lower credit ratings. Similarly, we expect that the effect would be stronger for bonds with smaller issuance volumes and shorter maturities as their issuers are more likely to be of lower credit quality.

Table 3 Panel A presents the results. Columns (1) and (2) show the results with sub-samples of bonds issued by high- and low-rated firms with respect to the median bond rating score. The coefficients suggest that the effect of institutional ownership on at-issue bond yield spreads is only negative and significant for low-rated issuers, and not significant for high-rated issuers. This finding is consistent with our expectation. Additionally, *HA* enters with a large coefficient in the regression for low-rated issuer sample, indicating that listing on multiple markets affects the cost of bond financing in a larger economic magnitude for the firms with more severe agency conflicts. Columns

(3) and (4) show the results for sub-samples of bonds with large and small issuance volumes. Columns (5) and (6) show the results with long-term and short-term maturities based on the median value. Again, the coefficients of *institutional_holding_perc* and *HA* are larger in column (4) (small issue) and column (6) (short-term bonds). This is consistent with our expectation that the effect of institutional ownership and cross-listing should be stronger for issuers with lower credit quality, where the need for institutional monitoring is stronger.

To further explore the role of institutional ownership on the cost of bond financing, we exploit a sub-sample that contains firms with multiple bonds and varying institutional ownership across time.[4] Focusing on these issuers allows us to isolate fully the effect of cross-firm differences that may bias our results. It also reduces our sample to 238 observations, however. We use a dummy *IH_increase* equal to 1 if the issuer has higher institutional holding for the current issue that its previous issue of corporate bonds, and 0 otherwise. The change in bond-yield spreads is calculated as the difference of bond-yield spreads between the current issue and previous issue. The sample mean value of *IH_increase* is 0.126 with a standard deviation of 0.333. There are 30 bonds in our sample issued by the same firm with increased institutional ownership. The mean value of the bond spread change is -0.521%. There are 208 bonds issued by the same firm that have seen no change or a decline institutional ownership. The mean value of bond spread change is -0.105% (see Figure 2). Table 3 Panel B presents the results of regressions that further confirm the finding from the descriptive statistics. Column (1) shows that an increase in institutional ownership gives a statistically significant reduction in bond-yield spreads. Including more control variables for firm characteristics in column (2) and bond features in column (3) does not alter the results.

4.2 State ownership and cost of bond financing (market environment impact)

4.2.1 Impact of market environment

Our baseline result, that state firms have lower cost of bond financing than private firms, is in line with large literature that documents the productivity-credit friction faced by state and private firms in a growth model of political economy (Allen, Qian, and Qian 2005; Song, Storesletten, and Zilibotti, 2011). To tease out differences in how the market environment affects the cost of debt for state and private firms, we examine two dimensions: whether the bond issuer is headquartered in high-marketized province, and whether the bond issuer operates in an industry dominated by state assets.

[4] Dropping issuers with single bond reduces our full sample to 400 bonds issued by 162 firms.

Table 4 shows the results for the impact of regional market development. We introduce *MarketIndx* in column (1), the interaction of *SOE* and *MarketIndx* in column (2), the interaction of *CentralSOE* and *MarketIndx*, *LocalSOE* and *MarketIndx* in column (4), and the interaction of *MajorSOE* and *MarketIndx* and *MinorSOE* and *MarketIndx* in column (6). The results in columns (1) and (2) suggest that the effect of market development on the cost of bond financing is not significant on average. However, when we add the interaction terms into the regression, the coefficient of dummy SOE is no longer significant (although still negative) but the interaction term enters negatively and significantly, indicating that the effect of state ownership in reducing the cost of bond financing is more significant in provinces with more developed market-supporting institutions.

Columns (3) to (6) give results for central and local SOEs, as well as major and minor SOEs. Central SOEs, by definition, have a higher level of political connection and face softer external budget constraints than local SOEs. Therefore, the effect of central government ownership is stronger than that of local government ownership in reducing bond spread coefficients (-1.089 versus -1.016). Similarly, major SOEs have a higher ratio of state ownership, and thus lower cost of debt coefficients than minor SOEs (-1.298 versus -0.792). The impact of stronger market institutions on heterogeneous SOEs is shown in columns (4) and (6). We find the effect of the local market environment in reducing the cost of debt is larger for central SOEs than local SOEs, and larger for major SOEs than minor SOEs. Taken together, our results suggest that lenders see environments with higher levels of marketization as favoring the state over private firms, especially those with high levels of state control.

Next, we compare the issuers in with higher and lower levels of state dominance. The results are given in Table 5. First, we see that state dominance by industry increases bond spreads, i.e. lower competition raises the cost of bond financing. For example, in column (1) the coefficient of *High_statedom* suggests that the issuers in higher state-dominant industry have on average 14.9% (0.410/2.75) higher bond-yield spreads than their counterparts in industries with low state dominance. Second, the coefficient of the interaction term (*High_statedom*SOE*) suggests that, compared to the state firms in industries with lower state dominance, state firms in industries with higher state dominance have on average a statistically significant 11.5% (0.316/2.75) higher bond-yield spread, while on average SOEs have statistically significant lower bond spreads.

Columns (3) to (6) replicate the regressions with interaction of *CentralSOE*, *LocalSOE*, *MajorSOE*, or *MinorSOE* and *High_statedom*. We find state dominance in an industry has little impact on central SOEs, but significantly increases the cost of debt for local SOEs. We explain this result as a local SOE, unlike a central SOE, is likely to be left to fend for itself in the marketplace,

making it more sensitive to market competition. On the other hand, state dominance has larger impact for major SOEs than minor SOEs as lenders see market competition as disciplining firms with stronger state-induced inefficiencies.

Taken together, the results of Tabled 4 and 5 are consistent with the interpretation that a higher level of marketization in the issuer's home province and industry helps to reduce the cost of debt for state firms more than private firms, particularly for state firms subject to higher government control or market exposure. This evidence suggests that lenders consider the benefits of the market environment in disciplining state-induced distortion or inefficiencies as outweighing the costs of any possible reduction in the state's implicit guarantee. In the following section, we propose a test to verify this proposition.

4.2.2 The 2012 anti-corruption reform

On December 4, 2012, less than three weeks after President Xi Jinping assumed power, the Politburo announced a set of major policy reforms summarized in a document known as the Eight-Point Regulation. It explicitly directed cadres to forego conspicuous perks and obtrusive behavior.[5] The release of the Eight-Point Regulation is widely seen as marking the launch of China's largest anti-corruption campaign in recent history. To date, over 1.3 million people have been punished for corruption, including six national leaders and hundreds of high-ranking party cadres in the political, military and business sectors (Griffin, Liu and Shu, 2017).

It is important to note that the Eight-Point Regulation target executives of SOEs, but not executives of private firms.[6] To the extent that the Eight-Point Regulation reduces state-induced distortions, we expect lenders to grant lower credit spreads to state firms in the post-regulation period relative to private firms. Moreover, there is little reason to believe that the Eight-Point Regulation affects the level of implicit state guarantee on SOEs.

Table 6 introduces a new variable *after8point*, which equals to one if the bond was issued in the post Eight-Point Regulation period. In column (2), which contains our full sample, the interaction term enters negatively and significantly. This suggests that the effect of state ownership in reducing bond spreads was stronger after the anti-corruption reform, which is consistent with our expectation. Columns (3) and (4) further split our sample into bond issuers headquartered in high-

[5] The Eight-Point Regulation requires leaders, among other things, to improve their work methods and maintain close contact with the grassroots, improve the efficiency of meetings and major events, reduce formalities, unnecessary greetings, and official letter issuance, practice thrift and strictly follow relevant regulations on meals, accommodation and cars. A *Forbes* article describes how the Eight-Point Regulation hurt a luxury Chinese liquor company due to negative shocks to demand: https://www.forbes.com/sites/hengshao/2013/09/03/tumbling-stock-of-luxury-chinese-liquor-company-reflects-strength-of-corruption-clamp-down/#4f51c28256e0.

[6] This statement is consistent Ke, Liu and Tang (2018) in which the authors construct a sample of 62 investigated firms during the campaign and find that 92% of investigated firms are SOE.

and low-marketized provinces. The results show that the effect is highly significant for issuers in high-marketized provinces. The coefficients in Column (3) suggest that for SOEs headquartered in a high-marketized province, the at-issue bond yield spreads are 29.2% (0.803/2.75) lower than for non-SOEs. After the regulation, the yield spreads are 23.8% (0.655/2.75) lower additionally. However, the regulation does not seem to have had a significant impact on SOEs headquartered in provinces with low levels of marketization. This evidence is consistent with high market institutions helps to discipline state-induced efficiency, especially after the issuance of the Eight-Point Regulation.

4.3 Institutional ownership and cost of bond financing (market environment impact)

Table 7 reports how the market environment affects the role of institutional ownership by partitioning our sample into issuers headquartered in high- and low-marketized provinces. The results show a non-significant relationship between institutional holding and spreads for the bond issuers headquartered in high-marketized provinces. In low- marketized provinces, the effect of institutional ownership is economically large and statistically significant in lowering spreads. Apparently, lenders place high value on the corporate governance role of institutional investors in alleviating information asymmetries and agency conflicts when the issuer's home institutional environment lacks strong legal institutions and market discipline.

5 Conclusions

How lenders evaluate heterogeneous ownership firms is an important, yet poorly understood, question. Using novel evidence from China's corporate bond market, we consider empirically whether bondholders respond to the ownership of government, institutional investors and foreign investors, and, if so, how responses vary with issuers under heterogeneous market development conditions.

We show in China's political economy, state firms enjoy significantly lower bond costs than private firms, especially firms owned by the central government or firms with a significant state equity stake. This finding suggests that lenders consider the benefit of an implicit state guarantee as outweighing the costs of any state-induced inefficiencies. Consistent with the corporate governance role played by institutional investors, we find institutional and foreign ownership helps reduce the cost of debt for firms, especially those with lower credit quality.

We also present evidence on how the market environment affects the role of state and institutional ownership on firms' cost of debt. The effect of state ownership is more pronounced if the

issuer is headquartered in a province with a higher level of marketization, operates in industries less dominant by state assets, or in the period following the Communist Party's anti-corruption campaign launched in 2012. Institutional ownership, in contrast, matters more in low-marketized environment. This evidence suggests lenders consider more highly developed market environments as better at disciplining inefficiencies of state firms than private firms, and that the governance role of institutional ownership matters more for firms in low-marketized environments. Against the background of China's ongoing privatization and capital market reforms, our findings highlight the importance of both ownership structure and market environment, as well as their interactions, on the cost of debt for firms.

References

Acharya, V., D. Anginer and A. Warburton (2016). The End of Market Discipline? Investor Expectations of Implicit Government Guarantees, Working Paper, NYU Stern.

Agarwal, S., W. Qian, A. Seru and J. Zhang (2015). Disguised Corruption: Evidence from Consumer Credit in China. Working Paper.

Aslan, H. and P. Kumar (2012). Strategic Ownership Structure and the Cost of Debt, *Review of Financial Studies*, 25: 2257–2299.

Ashbaugh, H., D. Collins and R. LaFond (2006). The Effects of Corporate Governance on Firms' Credit Ratings, *Journal of Accounting and Economics*, 42: 203–243.

Ben-Nasr, H., N. Boubakri, J. Cosset (2012). The Political Determinants of the cost of Equity: Evidence from Newly Privatized Firms. *Journal of Accounting Research*, 50: 605–646.

Bhojraj, S. and P. Sengupta (2003). Effect of Corporate Governance on Bond Ratings and Yields: The Role of Institutional Investors and Outside Directors. *Journal of Business,* 76 (3): 455–475.

Borisova, G., V. Fotak, K. Holland and W. Megginson (2015). Government Ownership and the Cost of debt: Evidence from Government Investments in Publicly Traded Firms. *Journal of Financial Economics*, 118: 168–191.

Borisova, G. and W. Megginson (2011). Does Government Ownership Affect the Cost of Debt? Evidence from Privatization, *Review of Financial Studies*, 24(8): 2693–2737.

Boubakri, N., J. Cosset and W. Saffar (2013). The Role of State and Foreign Owners in Corporate Risk-Taking: Evidence from Privatization, *Journal of Financial Economics*, 108: 641–658.

Carpenter, J., F. Lu and R. Whitelaw (2015). The Real Value of China's Stock Market. NBER Working Paper No. 20957.

Deng, Y., R. Morck, J. Wu and B. Yeung (2015). China's pseudo-monetary policy, *Review of Finance*, 19, 55–93.

Doidge, C., G.A. Karolyi and R.M. Stulz (2004). Why are foreign firms listed in the US worth more? *Journal of Financial Economics*, 71: 205–238.

Fan, G., X. Wang and H. Zhu (2011). *NERI Index of Marketization of China's Provinces: 2011 report* (in Chinese). Economic Science Press, Beijing.

Fan, G., X. Wang and H. Zhu (2017). *NERI Index of Marketization of China's Provinces: 2017 report* (in Chinese). Economic Science Press, Beijing.

Griffin, J., C. Liu and T. Shu (2017). Is the Chinese Anti-Corruption Campaign Authentic? Working Paper. Available at: https://ssrn.com/abstract=2779429

Gropp, R., C. Gruendi, and A. Guettler (2014). The Impact of Public Guarantees on Bank Risk-taking: Evidence from a Natural Experiment. *Review of Finance*, 18: 457–488.

Jiang, F. and K. Kim (2015). Corporate Governance in China: A Modern Perspective, *Journal of Corporate Finance*, 32: 190–216.

Ke, B., N. Liu, and S. Tang (2018). The Economic Consequences of Anti-Corruption Campaigns: Evidence from China. Working Paper. Available at: https://ssrn.com/abstract=2963478

Klein, A. and E. Zur (2011). The impact of hedge fund activism on the target firm's existing bondholders. *Review of Financial Studies* 24(5): 1735–1771.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1998). Law and Finance, *Journal of Political Economy*, 106: 1113–1155.

La Porta, R., F. Lopez-de-Silanes and A. Shleifer (1999). Corporate Ownership Around the World, *Journal of Finance*, 54: 471–517.

Laeven, L. and F. Valencia (2010). Resolution of Banking Crises: The Good, The Bad and the Ugly. IMF Working Paper No. 146.

Lin, C., Y. Ma, P. Malatesta and Y. Xuan (2011). Ownership Structure and the cost of Corporate Borrowing, *Journal of Financial Economics*, 100: 1–23.

Lin, C., Y. Ma, P. Malatesta and Y. Xuan (2013). Corporate Ownership Structure and Bank Loan Syndicate Structure, *Journal of Financial Economics*, 104: 1–22.

Lin, C., R. Mock, B. Yeung and X. Zhao (2016). Anti-Corruption Reforms and Shareholder Valuations: Event Study Evidence from China. Working Paper, University of Hong Kong.

Qian, J., Strahan, P. (2007). How laws and institutions shape financial contracts: The case of bank loans. *Journal of Finance* 62, 2803–34.

Reese, W.A. and M.S. Weisbach (2002). Protection of Minority Shareholder Interests, Cross- Listings in the United States, and Subsequent Equity Offerings. *Journal of Financial Economics* 66: 65–104.

Shleifer, A., Vishny, R. (1997). A Survey of Corporate Governance, *Journal of Finance* 52: 737–783.

Song Z., K. Storesletten and F. Zilibotti (2011). Growing Like China, *American Economic Review* 101(1): 196–233.

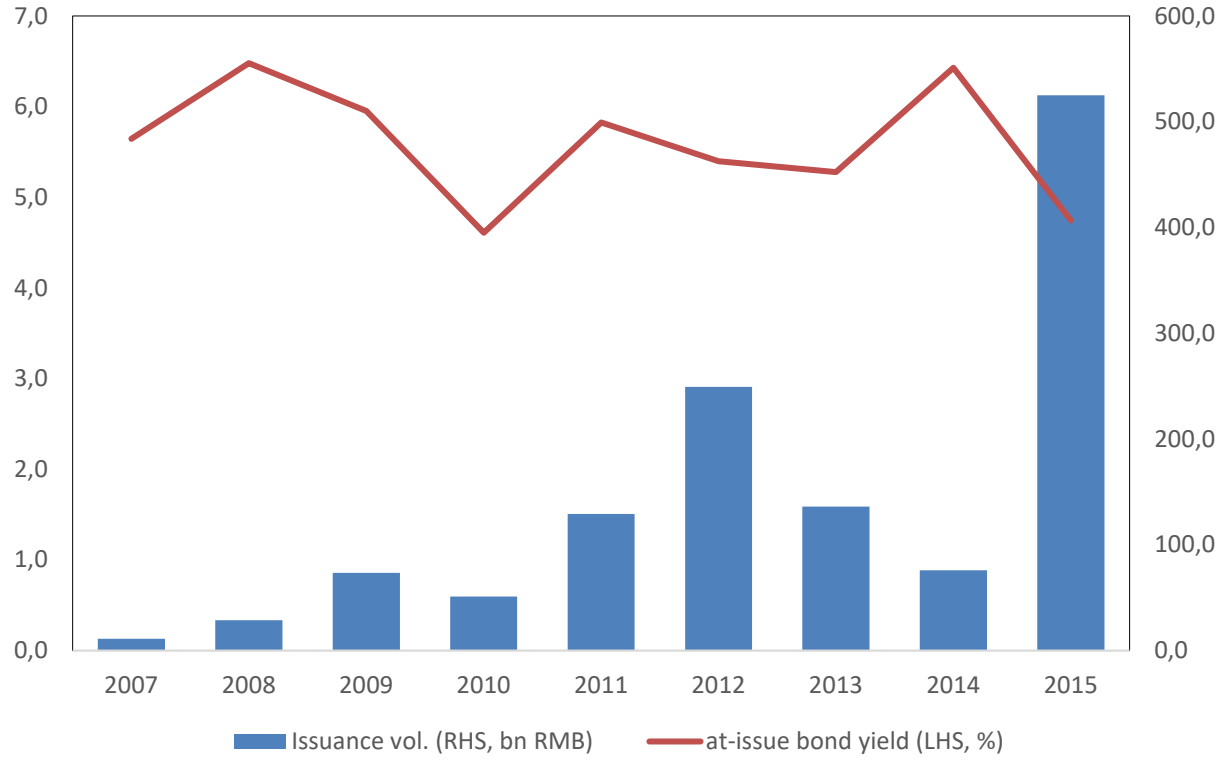
Stiglitz, J., J. Jaramillo-Vallejo, Y. Park (1993). The Role of the State in Financial Markets, World Bank Research Observer Annual Conference on Development Economics Supplement: 19–61.

Sun, Q., W.H. Tong and Y. Wu (2013). Overseas listing as a policy tool: Evidence from China's H-shares. *Journal of Banking & Finance* 37, 1460–1474.

Wang, A., and G. Zhang (2009). Institutional Ownership and Credit Spreads: An Information Asymmetry Perspective. Journal of Empirical Finance, 16(4): 597–612.

Figures

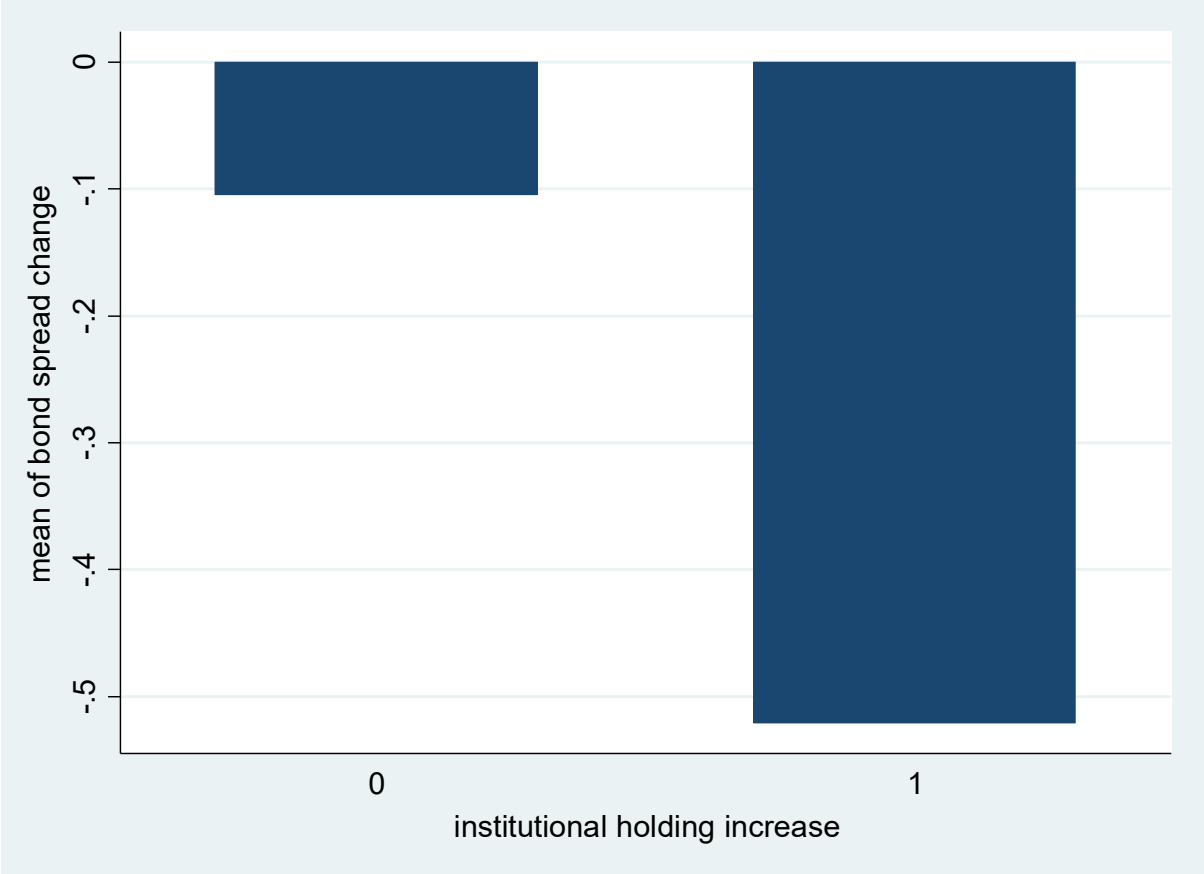
Figure 1 Development of the Chinese corporate bond market



Source: iFind.

This figure plots the growth of Chinese corporate bond market (regulated by the stock exchanges and CSRC) since it was launched in 2007.

Figure 2 Average change of bond spread by the same issuers



This figure plots the average change of bond spread by the same bond issuer by group of issuers with/without increase of institutional holding (percentage). The x-axis equals 1 if the issuers have an increase in institutional ownership and 0 otherwise. In our sample, there are 30 bonds issued by the same issuers that have increase in institutional ownership, with the mean value of bond spread change at -0.521% and 208 bonds issued by the same issuers that do not have changes in institutional ownership with the mean value of bond spread change at -0.105%.

Appendix A Variables and definitions

Variable	Definition
Bond characteristics	
Issuance vol.	issuance volume of bonds
At-issue bond yield	at-issue yield of bond
Bond spread	difference between at-issue yield of the bond and 5-year treasury bond yield at date of issuance
Maturity (days)	maturity of bond in days
Maturity (years)	maturity of bond in years
Callable	1 if issue is callable on a pre-determined schedule, 0 otherwise
Collateral	1 if issue is based on collateral, 0 otherwise
Bond rating score	numeric score of the bond rating, e.g. 6 for AAA+, 5 for AAA, etc.
Issuer characteristics	
Insitution_holding_perc	percentage of institutional holding
HA	1 if listed on both H share and A share, 0 otherwise
QFII_dummy	1 if Qualified Foreign Institutional Investors (QFII) have invested in the equity
SOE	1 if firm is a state-owned enterprise (SOE), 0 otherwise
CentralSOE	1 if firm is central SOE, 0 otherwise
LocalSOE	1 if firm is local SOE, 0 otherwise
MajorSOE	1 if state ownership is above median for SOEs, 0 otherwise
MinorSOE	1 if state ownership is below median for SOEs, 0 otherwise
Firm age	natural logarithm of the difference between the issuance/trading year and the firm's establishment year
Profitability	ratio of net profit to total assets.
Zscore	sum of 1.2*working capital, 1.4*retained earnings, 3.3*EBIT, and 0.999*sales, divided by total assets.
CFrights	cash-flow rights of largest ultimate owner of firm
Wedge	difference between the control rights and cash-flow rights of largest ultimate owner of firm
Regional and industry characteristics	
High_statedom	1 if the value of state-dominance is above its median, 0 otherwise.
MarketIndx	provincial level index measuring strength of market forces (institutions), from Fan et al. (2011, 2017).
Log_GDP	natural logarithm of provincial GDP

Table 1 Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Bond characteristics					
at-issue bond yield (%)	630	6.05	1.17	3.30	9.20
Bond spread (%)	630	2.75	1.13	0.31	5.83
Issuance vol (bn RMB)	630	1.30	1.62	0.05	16.00
Maturity(year)	630	5.42	1.86	1.00	15.00
Maturity(day)	630	1980.88	680.87	366.00	5479.00
Collateral	630	0.40	0.49	0.00	1.00
Callable	630	0.73	0.45	0.00	1.00
Bond rating score	601	4.66	0.85	3.00	6.00
Issuer rating score	630	4.41	0.91	1.00	6.00
Firm characteristics					
Institution_holding_perc	620	0.49	0.24	0.00	0.98
HA	630	0.10	0.30	0.00	1.00
QFII_dummy	630	0.13	0.34	0.00	1.00
Firm age	630	2.74	0.38	0.69	3.47
Profitability	628	0.08	0.04	–0.10	0.27
Zscore	624	1.22	0.71	–0.02	6.28
SOE	630	0.48	0.50	0.00	1.00
CentralSOE	630	0.15	0.36	0.00	1.00
LocalSOE	630	0.33	0.47	0.00	1.00
MajorSOE	630	0.24	0.43	0.00	1.00
MinorSOE	630	0.24	0.43	0.00	1.00
Wedge	585	0.18	0.26	–1.31	0.95
CFrights	585	0.37	0.18	0.01	0.89

This table presents the summary statistics of the characteristics of bonds and bond issuers in our sample. This cross-section bond sample includes a total of 630 bonds, issued from 2007 to 2015.

Table 2 Ownership structure and cost of bond financing (baseline tests)

Dependent variable	At-issue bond spread				
	(1)	(2)	(3)	(4)	(5)
Collateral	0.363***	0.300***	0.279***	0.277***	0.354***
	(0.0748)	(0.0794)	(0.0801)	(0.0802)	(0.0740)
Callable	–0.0844	–0.103	–0.118	–0.0888	–0.149*
	(0.0884)	(0.0915)	(0.0934)	(0.0931)	(0.0897)
Bond rating score	–0.671***	–0.802***	–0.801***	–0.821***	–0.625***
	(0.0543)	(0.0527)	(0.0548)	(0.0531)	(0.0561)
SOE	–0.691***				–0.645***
	(0.0828)				(0.0859)
Institution_holding_perc		–0.587***			–0.448***
		(0.172)			(0.164)
HA			–0.325***		–0.254***
			(0.0912)		(0.0981)
QFII_dummy				–0.176*	–0.0499
				(0.0946)	(0.0962)
Firm age	–0.198**	–0.177*	–0.221**	–0.213**	–0.199**
	(0.0888)	(0.0934)	(0.0969)	(0.0949)	(0.0904)
Zscore	–0.0637	–0.0181	–0.0379	–0.0292	–0.0550
	(0.0418)	(0.0436)	(0.0446)	(0.0449)	(0.0424)
Profitability	–3.576***	–3.348***	–3.700***	–3.589***	–3.342***
	(0.733)	(0.719)	(0.724)	(0.711)	(0.747)
Log_GDP	–0.0627	–0.00723	0.0175	0.00532	–0.0487
	(0.0547)	(0.0554)	(0.0543)	(0.0542)	(0.0562)
_cons	7.745***	7.635***	7.427***	7.518***	7.665***
	(0.702)	(0.731)	(0.722)	(0.719)	(0.727)
Year FE	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y
N	593	586	593	593	586
adj. R-sq	0.522	0.474	0.463	0.460	0.532

This table reports the results of the regressions examining the determinants of the cost of bond financing (measured by the difference between at-issue bond yield spread and the 5-year treasury bond yield) using the full bond-level sample. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 3 Ownership structure and cost of bond financing

Panel A Sub-sample tests

Dependent variable	At-issue bond spread					
	(1)	(2)	(3)	(4)	(5)	(6)
	High_rated	*Low_rated*	*Large issue*	*Small issue*	*Long-term*	*Short-term*
SOE	–0.845***	–0.829***	–1.148***	–0.787***	–0.841***	–1.101***
	(0.147)	(0.107)	(0.143)	(0.115)	(0.0888)	(0.321)
Collateral	–0.0148	–0.0167	0.343***	–0.0717	0.132*	–0.174
	(0.107)	(0.0971)	(0.130)	(0.103)	(0.0798)	(0.273)
Callable	–0.0351	–0.0422	0.249*	–0.120	0.0255	0.719**
	(0.116)	(0.148)	(0.136)	(0.151)	(0.0980)	(0.291)
Institution_holding_perc	0.0706	–0.647***	–0.397*	–0.813***	–0.742***	–0.981*
	(0.244)	(0.213)	(0.237)	(0.237)	(0.184)	(0.528)
HA	–0.214**	–1.191***	–0.298**	–1.296***	–0.500***	–1.724***
	(0.0966)	(0.278)	(0.123)	(0.206)	(0.102)	(0.345)
QFII_dummy	–0.0591	–0.00294	0.000108	–0.288	–0.125	–0.444
	(0.130)	(0.152)	(0.131)	(0.195)	(0.117)	(0.471)
Firmage	0.195	–0.511***	0.120	–0.446**	–0.0853	–0.949*
	(0.155)	(0.167)	(0.150)	(0.175)	(0.108)	(0.501)
Zscore	–0.195*	–0.102*	–0.0866	–0.103	–0.128**	0.125
	(0.101)	(0.0571)	(0.0795)	(0.0681)	(0.0600)	(0.203)
Profitability	–2.675**	–2.898**	–3.896***	–3.243**	–2.909***	–8.837**
	(1.227)	(1.180)	(1.336)	(1.373)	(1.009)	(4.063)
Log_GDP	–0.0870	0.0256	–0.156	–0.0109	0.00840	–0.178
	(0.0750)	(0.0712)	(0.102)	(0.0684)	(0.0546)	(0.259)
_cons	3.711***	5.270***	5.349***	6.157***	4.835***	9.074***
	(0.975)	(1.037)	(1.055)	(0.939)	(0.806)	(2.571)
Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
N	212	404	280	336	513	103
adj. R-sq	0.378	0.284	0.429	0.376	0.441	0.485

This table reports the results of the regressions examining the determinants of the cost of bond financing (measured by the difference between at-issue bond yield spread and the 5-year treasury bond yield) using the bond-level sub-samples. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Panel B Effect of increased institutional holdings

Dependent variable	Change in at-issue bond spread		
	(1)	(2)	(3)
Collateral	–0.147 (0.103)	–0.0940 (0.0945)	–0.0599 (0.101)
Callable	–0.202 (0.133)	–0.280* (0.147)	–0.190 (0.150)
IH_increase	–0.468*** (0.163)	–0.488*** (0.166)	–0.480*** (0.167)
Log_maturity			–0.304 (0.197)
SOE		–0.233* (0.131)	–0.166 (0.139)
HA		0.0803 (0.123)	0.132 (0.131)
QFII_dummy		–0.0663 (0.103)	–0.0629 (0.110)
Firm age		0.0616 (0.121)	0.0586 (0.120)
Profitability		–3.324*** (1.275)	–2.930** (1.279)
Zscore		0.132* (0.0765)	0.107 (0.0765)
log_gdp		–0.0588 (0.0592)	–0.0483 (0.0598)
_cons	–0.0276 (0.202)	0.572 (0.668)	2.762* (1.573)
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
N	238	238	238
adj. R-sq	0.022	0.031	0.040

This table reports the results of the regressions examining the impact of institutional holding increase of the same bond issuers on the cost of bond financing. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 4 State-ownership and cost of bond financing (impact of regional market development)

Dependent variable	At-issue bond spread					
	(1)	(2)	(3)	(4)	(5)	(6)
Collateral	0.134*	0.113	0.131*	0.112	0.176**	0.151*
	(0.0779)	(0.0777)	(0.0784)	(0.0783)	(0.0766)	(0.0772)
Callable	0.0619	0.0538	0.0584	0.0496	0.0168	0.0129
	(0.0991)	(0.0996)	(0.0990)	(0.0999)	(0.0950)	(0.0953)
SOE	–1.034***	–0.197				
	(0.0898)	(0.347)				
MarketIndx	–0.00748	0.0550	–0.00682	0.0550	–0.00585	0.0647
	(0.0336)	(0.0449)	(0.0339)	(0.0449)	(0.0324)	(0.0441)
SOE*MarketIndx		–0.114**				
		(0.0465)				
CentralSOE			–1.089***	–0.0666		
			(0.128)	(0.587)		
LocalSOE			–1.016***	–0.243		
			(0.0928)	(0.357)		
CentralSOE*MarketIndx				–0.137*		
				(0.0800)		
LocalSOE*MarketIndx				–0.107**		
				(0.0479)		
MajorSOE					–1.298***	–0.294
					(0.0995)	(0.401)
MinorSOE					–0.792***	0.170
					(0.101)	(0.385)
MajorSOE*MarketIndx						–0.135***
						(0.0519)
MinorSOE*MarketIndx						–0.132**
						(0.0523)
Institution_holding_perc	–0.639***	–0.645***	–0.630***	–0.635***	–0.604***	–0.610***
	(0.176)	(0.175)	(0.177)	(0.177)	(0.174)	(0.173)
HA	–0.578***	–0.539***	–0.563***	–0.521***	–0.579***	–0.536***
	(0.114)	(0.119)	(0.118)	(0.126)	(0.115)	(0.119)
QFII_dummy	–0.114	–0.123	–0.109	–0.118	–0.187	–0.194
	(0.121)	(0.120)	(0.122)	(0.122)	(0.121)	(0.120)
Firm age	–0.181	–0.185	–0.190	–0.192	–0.307***	–0.305***
	(0.117)	(0.115)	(0.117)	(0.117)	(0.117)	(0.114)
Zscore	–0.0991*	–0.108**	–0.0968*	–0.106**	–0.0885*	–0.0970*
	(0.0515)	(0.0507)	(0.0512)	(0.0507)	(0.0513)	(0.0502)
Profitability	–3.585***	–3.566***	–3.616***	–3.580***	–3.699***	–3.642***
	(0.923)	(0.915)	(0.919)	(0.915)	(0.933)	(0.930)
Log_GDP	–0.0410	–0.0432	–0.0424	–0.0468	–0.0359	–0.0292
	(0.0714)	(0.0702)	(0.0717)	(0.0713)	(0.0712)	(0.0699)
_cons	5.513***	5.164***	5.560***	5.263***	5.598***	5.102***
	(0.829)	(0.814)	(0.825)	(0.833)	(0.786)	(0.774)
Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
N	616	616	616	616	616	616
adj. R-sq	0.403	0.409	0.402	0.408	0.415	0.424

This table reports the results of the regressions examining the impact of regional market institutions on the association between state-ownership and the cost of bond financing. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 5 Ownership structure and at-issue bond yield spread (impact of government dominance by industry)

Dependent variable	At-issue bond spread					
	(1)	(2)	(3)	(4)	(5)	(6)
Collateral	0.143*	0.126	0.141*	0.126	0.185**	0.173**
	(0.0768)	(0.0767)	(0.0773)	(0.0772)	(0.0757)	(0.0764)
Callable	0.0530	0.0531	0.0503	0.0468	0.00766	0.00700
	(0.0987)	(0.0995)	(0.0986)	(0.100)	(0.0948)	(0.0948)
SOE	–1.051***	–1.196***				
	(0.0886)	(0.121)				
High_statedom	0.410***	0.268*	0.407***	0.268*	0.405***	0.295*
	(0.139)	(0.159)	(0.139)	(0.160)	(0.134)	(0.155)
SOE*High_statedom		0.316**				
		(0.159)				
CentralSOE			–1.093***	–1.181***		
			(0.127)	(0.201)		
LocalSOE			–1.037***	–1.108***		
			(0.0912)	(0.138)		
CentralSOE*High_statedom				0.224		
				(0.246)		
LocalSOE*High_statedom				0.352**		
				(0.174)		
MajorSOE					–1.316***	–1.532***
					(0.0991)	(0.135)
MinorSOE					–0.805***	–0.852***
					(0.0997)	(0.153)
MajorSOE*High_statedom						0.413**
						(0.182)
MinorSOE*High_statedom						0.137
						(0.191)
Institution_holding_perc	–0.679***	–0.686***	–0.672***	–0.669***	–0.644***	–0.620***
	(0.169)	(0.169)	(0.170)	(0.174)	(0.168)	(0.171)
HA	–0.563***	–0.586***	–0.551***	–0.563***	–0.564***	–0.584***
	(0.109)	(0.109)	(0.114)	(0.112)	(0.111)	(0.112)
QFII_dummy	–0.111	–0.102	–0.107	–0.101	–0.185	–0.168
	(0.122)	(0.122)	(0.123)	(0.124)	(0.121)	(0.123)
Firm age	–0.209*	–0.186	–0.216*	–0.191	–0.336***	–0.314***
	(0.117)	(0.118)	(0.117)	(0.119)	(0.116)	(0.119)
Zscore	–0.0867*	–0.0919*	–0.0849*	–0.0909*	–0.0757	–0.0818*
	(0.0500)	(0.0495)	(0.0498)	(0.0494)	(0.0492)	(0.0491)
Profitability	–3.680***	–3.797***	–3.705***	–3.854***	–3.796***	–3.977***
	(0.916)	(0.907)	(0.912)	(0.906)	(0.926)	(0.931)
Log_GDP	–0.0511	–0.0446	–0.0515	–0.0462	–0.0434	–0.0380
	(0.0561)	(0.0558)	(0.0562)	(0.0560)	(0.0559)	(0.0561)
_cons	5.665***	5.573***	5.697***	5.602***	5.737***	5.690***
	(0.777)	(0.760)	(0.774)	(0.762)	(0.746)	(0.733)
Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
N	616	616	616	616	616	616
adj. R-sq	0.411	0.414	0.410	0.412	0.423	0.426

This table reports the results of the regressions examining the impact of government dominance in the affiliated industry of bond issuers on the association between state-ownership and the cost of bond financing. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 6 Effects of the anti-corruption reform (Eight-Point Regulation)

Dependent variable	At-issue bond spread			
	(1)	(2)	(3)	(4)
		Full sample	*High-marketized region*	*Low-marketized region*
Collateral	0.122	0.153*	0.181	0.0548
	(0.0766)	(0.0785)	(0.115)	(0.109)
Callable	0.0576	0.0969	–0.0639	0.0580
	(0.0991)	(0.0996)	(0.167)	(0.129)
SOE	–0.742***	–0.795***	–0.803***	–0.580***
	(0.118)	(0.117)	(0.205)	(0.162)
SOE*after8point	–0.458***	–0.513***	–0.655***	–0.153
	(0.137)	(0.112)	(0.229)	(0.192)
After8point		–0.345**		
		(0.142)		
Institution_holding_perc	–0.656***	–0.645***	–0.361	–1.244***
	(0.172)	(0.173)	(0.268)	(0.234)
HA	–0.595***	–0.646***	–0.705***	–0.743***
	(0.111)	(0.108)	(0.193)	(0.143)
QFII_dummy	–0.120	–0.104	–0.308*	–0.213
	(0.118)	(0.118)	(0.171)	(0.141)
Firm age	–0.175	–0.183	–0.398**	0.00175
	(0.118)	(0.113)	(0.171)	(0.155)
Zscore	–0.102**	–0.123**	–0.121*	–0.181**
	(0.0501)	(0.0507)	(0.0644)	(0.0833)
Profitability	–3.636***	–3.230***	–4.848***	–1.621
	(0.913)	(0.938)	(1.241)	(1.488)
Log_GDP	–0.0374	–0.0121	–0.0941	0.01000
	(0.0562)	(0.0559)	(0.124)	(0.0807)
_cons	5.283***	5.213***	6.738***	5.365***
	(0.813)	(0.700)	(1.605)	(0.927)
Year FE	YES	NO	YES	YES
Industry FE	YES	YES	YES	YES
N	616	616	319	297
adj. R-sq	0.413	0.400	0.408	0.453

This table reports the results of the regressions examining the impact of the 2012 anti-corruption Reform (the Eight-Point Regulation announced in December 2012) on the association between state-ownership and the cost of bond financing. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 7 Ownership structure and cost of bond financing (role of institutional ownership)

Dependent variable	At-issue bond spread	
	(1)	(2)
	High marketized region	*Low marketized region*
Collateral	0.173	0.0553
	(0.117)	(0.109)
Callable	–0.0520	0.0575
	(0.167)	(0.128)
Institution_holding_perc	–0.406	–1.230***
	(0.271)	(0.232)
SOE	–1.309***	–0.659***
	(0.135)	(0.120)
HA	–0.698***	–0.732***
	(0.194)	(0.144)
QFII_dummy	–0.290*	–0.212
	(0.175)	(0.142)
Firm age	–0.377**	–0.0193
	(0.172)	(0.154)
Zscore	–0.108*	–0.183**
	(0.0637)	(0.0833)
Profitability	–4.987***	–1.578
	(1.239)	(1.483)
Log_GDP	–0.0962	0.00508
	(0.125)	(0.0812)
Cons.	7.025***	5.498***
	(1.558)	(0.927)
Chi-sq(Institution_holding_perc)		5.84**
(p-value)		(0.0156)
Chi-sq(SOE)		14.20
(p-value)		(0.0002)
Year FE	YES	YES
Industry FE	YES	YES
N	319	297
adj. R-sq	0.397	0.454

This table reports the results of the regressions examining the role of institutional ownership in reducing cost of bond financing in high marketized regions versus low marketized region. The dependent variable is the at-issue bond yield spread. We control for both bond characteristics and bond-issuer characteristics in the regressions. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

BOFIT Discussion Papers

A series devoted to academic studies by BOFIT economists and guest researchers. The focus is on works relevant for economic policy and economic developments in transition / emerging economies.

2018
- No 1 Zheng (Michael) Song and Wei Xiong: Risks in China's financial system
- No 2 Jennifer N. Carpenter, Fangzhou Lu and Robert F. Whitelaw: The real value of China's stock market
- No 3 Bing Xu: Permissible collateral and access to finance: Evidence from a quasi-natural experiment
- No 4 Stefan Angrick and Naoyuki Yoshino: From window guidance to interbank rates. Tracing the transition of monetary policy in Japan and China
- No 5 Veronika Belousova, Alexander Karminsky and Ilya Kozyr: Bank ownership and profit efficiency of Russian banks
- No 6 Chengsi Zhang and Chao Dang: Is Chinese monetary policy forward-looking?
- No 7 Israel Marques II: Firms and social policy preferences under weak institutions: Evidence from Russia
- No 8 Ivan Lyubimov, Margarita Gvozdeva and Maria Lysyuk: Towards increased complexity in Russian regions: networks, diversification and growth
- No 9 Jeannine Bailliu, Xinfen Han, Mark Kruger, Yu-Hsien Liu and Sri Thanabalasingam: Can media and text analytics provide insights into labour market conditions in China?
- No 10 Sanna Kurronen: Oil price collapse and firm leverage in resource-dependent countries
- No 11 Marlene Amstad, Huan Ye and Guonan Ma: Developing an underlying inflation gauge for China
- No 12 Michael Funke, Rongrong Sun and Linxu Zhu: The credit risk of Chinese households – A micro-level assessment
- No 13 Yiyi Bai, Tri Vi Dang, Qing He and Liping Lu: Does lending relationship help or alleviate the transmission of liquidity shocks? Evidence from a liquidity crunch in China
- No 14 Hao Wang, Jan Fidrmuc and Yunhua Tian: Growing against the background of colonization? Chinese labor market and FDI in a historical perspective
- No 15 Paul-Olivier Klein and Laurent Weill: Bank profitability and economic growth
- No 16 Zuzana Fungáčová, Paul-Olivier Klein and Laurent Weill: Persistent and transient inefficiency: Explaining the low efficiency of Chinese big banks
- No 17 Oleksandr Faryna and Heli Simola: The transmission of international shocks to CIS economies: A global VAR approach
- No 18 Michael Funke, Andrew Tsang and Linxu Zhu: Not all cities are alike: House price heterogeneity and the design of macro-prudential policies in China
- No 19 Timo Korkeamäki, Nader Virk, Haizhi Wang and Peng Wang: Learning Chinese? The changing investment behavior of foreign institutions in the Chinese stock market
- No 20 Bingyang Lv, Yongzheng Liu, Yan Li and Siying Ding: Fiscal incentives, competition, and investment in China
- No 21 Tho Pham, Oleksandr Talavera and Andriy Tsapin: Shock contagion, asset quality and lending behavior'
- No 22 Johannes C. Buggle and Steven Nafziger: The slow road from serfdom: Labor coercion and long-run development in the former Russian Empire
- No 23 Eeva Kerola: In search of fluctuations: Another look at China's incredibly stable GDP growth

2019
- No 1 Çağatay Bircan and Orkun Saka: Lending cycles and real outcomes: Costs of political misalignment
- No 2 Lucy Chernykh, Denis Davydov and Jukka Sihvonen: Financial stability and public confidence in banks
- No 3 Yin-Wong Cheung and Shi He: Truths and myths about RMB misalignment: A meta-analysis
- No 4 Yuping Deng, Yanrui Wu, Helian Xu: Political connections and firm pollution behaviour: An empirical study
- No 5 Sophia Chen, Lev Ratnovski and Pi-Han Tsai: Credit and fiscal multipliers in China
- No 6 Alexander Kostrov and Mikhail Mamonov: The formation of hidden negative capital in banking: A product mismatch hypothesis
- No 7 Ning Cai, Jinlu Feng, Yong Liu, Hong Ru and Endong Yang: Government credit and trade war
- No 8 Michael Funke and Andrew Tsang: The direction and intensity of China's monetary policy conduct: A dynamic factor modelling approach
- No 9 Hamza Bennani: Does People's Bank of China communication matter? Evidence from stock market reaction
- No 10 Alexei Karas, William Pyle and Koen Schoors: Deposit insurance, market discipline and bank risk
- No 11 Gerard Roland and David Y. Yang: China's lost generation: Changes in beliefs and their intergenerational transmission
- No 12 Abel François, Sophie Panel and Laurent Weill: Are some dictators more attractive to foreign investors?
- No 13 Anna Pestova and Mikhail Mamonov: Should we care? The economic effects of financial sanctions on the Russian economy
- No 14 Haiyue Yu, Jin Cao and Shulong Kang: Fertility cost, intergenerational labor division, and female employment
- No 15 Max Breitenlechner and Riikka Nuutilainen: China's monetary policy and the loan market: How strong is the credit channel in China?
- No 16 Yiping Huang, Xiang Li and Chu Wang: What does peer-to-peer lending evidence say about the risk-taking channel of monetary policy?
- No 17 Heli Simola: Evaluating international impacts of China-specific shocks in an input-output framework
- No 18 Sris Chatterjee, Xian Gu, Iftekhar Hasan and Haitian Lu: Ownership structure and the cost of debt: Evidence from the Chinese corporate bond market

ISSN 1456-4564 (print) // ISSN 1456-5889 (online)