Implicit Guarantee and Shadow Banking: the Case of Trust Products[1]

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Abstract

A central feature of China's shadow banking is the prevalence of implicit guarantee investors come to expect for returns on risky investments. We examine underlying investments and the pricing of a comprehensive set of investment products issued by trust companies. We find that a large share of the capital flows into the real estate industry. The pricing of the products not only depends on the risks of the underlying investments, but also on the strength of implicit guarantee. The yields decrease with the strength of implicit guarantee, and the spread-to-risk sensitivity is flattened by strong implicit guarantee. Finally, we find evidence that one reason behind the exponential growth of shadow banking in China since 2010 is the need to fill the financing gap of the real estate industry.

1. Introduction

Shadow banking has experienced exponential growth in China since early 2000s. The sector is important in helping fuel the country's fascinating economic growth, but also leads to concerns about the magnitude of debt and the risk it adds to the financial system, and makes people wonder whether it will lead to another financial crisis. At the core of these activities are so-called wealth management products (WMPs) or investment products sponsored by banks, trusts, and securities firms, which constitute 56.5% of total shadow banking assets.[2] These products are marketed as alternatives to bank deposits to both individual and institutional investors, and the payoffs are backed by investments in firms, real projects, or publicly traded securities.

In this study, we examine a comprehensive set of investment products sponsored by trust firms—the largest nonbank financial industry. We shed light on two issues that are key to understanding the workings of China's shadow banking. First, we investigate what kinds of underlying investments shadow banking tends to fund. Does it help fund productive firms and industries that otherwise can't raise funds from the official financial system (including banks, and stock and bond markets)? Or does the capital mainly go to industries the regulators try to restrict funds from, especially the red hot real estate industry? Answering these questions helps understand the fundamental risk shadow banking is associated with.

Second, we examine a central feature of China's shadow banking–the prevalence of implicit guarantee investors come to expect for returns on risky investments (see e.g., Dang, Wang and Yao, 2016; Zhu, 2016). Although the product prospectuses clearly state returns are contingent on the investment payoffs and are not guaranteed, investors generally believe that the expected yields in the prospectuses are the promised yields, and that the sponsoring

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[2] This is based on a Moody's report in 2017. Other important forms of China shadow banking are entrusted loans (20.5%), undiscounted bankers' acceptances (6.0%), informal lending (5.3%) and loans by finance companies (5.0%).

financial firm and/or the distributing bank will make up the shortfall if the underlying borrowers fail to pay. In other words, they believe these products are implicitly guaranteed by the sponsoring financial firm, the distributing bank, their controlling shareholders, and ultimately the central government for the sake of social stability.

Implicit guarantee reduces investors' incentives to monitor and discipline borrowers, which can induce excessive risk-taking on the borrowers' side. On the other hand, it can address the lemons problem due to asymmetric information and therefore leads to more credit provision (Gorton and Souleles, 2006; Gorton and Metrick, 2012). Moreover, the implicit nature of the guarantee suggests that it may or may not materialize in cases of default. The uncertainty about the guarantee can make the investors remain sensitive to the underlying risk and maintain certain market discipline on the borrower (Nosal and Ordoñez, 2016).

We examine the pricing of these investment products and investigate whether and to what extent investors price implicit guarantee and the underlying investment risk. We are interested to see whether investors have the ability to distinguish the different risks of the underlying investments, and whether they distinguish between different strengths of implicit guarantee.

Our investigation shows that a large portion (24.3-41.8%) of the funds raised through trust products flowed to the red hot real estate industry that the regulators try to rein in. It is followed by commercial and industrial sectors (19.0%), infrastructure (18.2%), financial institutions (11.7%) and then securities market (5.0%). In particular, trust companies that are controlled by central SOEs (state-owned enterprises controlled by the central government) invest a largest share of capital to real estate.

We find evidence that the growth of these products is partly driven by the financing gap between bank loans to and capital needs of the real estate industry. The amount of capital flowing to a province increases with its investment-to-bank-loan ratio for the industry and its housing price.

Our analysis of the product pricing reveals that the pricing depends on both the underlying borrower's risk as well as the strength of the implicit guarantee. Specifically, the product yield spread is higher if the borrower is from the riskier real estate industry, or located a province with low GDP; but the yield decreases with the borrower size. We measure the (perceived) strength of the implicit guarantee by the sponsoring trust firm's size, the type of its controlling shareholders (central SOEs, local SOEs, or non-SOEs), and whether the product is sold through a bank, especially one of the five largest state-owned banks (Big-5 banks).[3] We find that the yields decreases if the trust firm is large, if it is controlled by a central SOE, and if it is sold via a Big-5 bank. In addition, using China's stock market crash in the summer of 2015 as a negative shock, we find that investors are sensitive to the risk the sponsoring trust firm is exposed to. Specifically, yield spreads increase more for products sponsored by trusts that had invested larger amounts in securities markets.

Moreover, strong implicit guarantee flattens the sensitivity of yield spread to borrower risk (spread-to-risk sensitivity). We find various evidence for this. First, we divide the sample into groups with different strengths of implicit guarantee, based on the trust firm's size, the type of its shareholders and whether the product is sold through a Big-5 bank. Under each classification of guarantee strength, spread is more sensitive to borrower risk (measured by borrower size, its provincial GDP growth, and whether it is in the real restate industry) when the guarantee is perceived to be stronger.

Second, for the subsample of products investing in real estate, we investigate how the spreads react to the local housing market risk where the borrower is located, and how that sensitivity depends on implicit guarantee. We measure housing market risk following Glaeser,

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[3] The Big-5 banks refer to the five largest state-owned commercial banks in China: Industrial and Commercial Bank of China (ICBC), Bank of China (BOC), Construction Bank of China (CCB), Agricultural Bank of China (ABC), and the Bank of Communications (BOComm). Their combined share of total bank deposits was 49% in 2013.

Huang, Ma and Shleifer (2017). The evidence shows that the spread increases with housing market risk, but only when the sponsoring trust firm is a non-SOE.

Third, we use the first default case of investment products in 2014 as a shock to the market perception about these products' risk level, and examine the pricing changes afterwards and how the changes depend on the strength of implicit guarantee. The spreads increase after the first default case, but only for products sponsored by non-SOE trust firms.

Fourth, we use a regulation in 2010 restricting housing purchases as a shock to the real estate industry. In order to curb the speculative activities in property market in recent years, the central government announced the "housing purchase restriction" policy (the so-called "Order 10") in the spring of 2010. The regulation did flatten housing prices in the next couple of years. Consistent with the notion that risk increases shortly after the regulation, the spreads of product investing in real estate increases. The increase, however, only applies to those sponsored by local SOE or non-SOE trust firms.

Our paper is related to the literature that studies implicit guarantee provided by financial firms to investors (also known as implicit recourse), or by the government to financial firms. Limited empirical evidence on implicit recourse prior to the financial crisis is mainly through studies of credit-card securitization and generally shows that the market reacts favorably to such guarantee (Higgins and Mason, 2004; Calomiris and Mason, 2004; Vermilyea at al. 2008). In contrast, Acharya, Schnabl and Suarez (2013) argue that securitization without risk transfer due to banks' explicit guarantee to investors contributes to the recent financial crisis.

A number of papers examine the pricing of subordinated debt issued by US banks, and document that the spread-to-risk sensitivity changes as the perception of government guarantee to banks varies (Flannery and Sorescu, 1996; Sironi, 2003; Morgan and Stiroh, 2005; Balasubramnian and Cyree, 2011). Recently, Acharya, Anginer, and Warburton (2016) show that bond spreads are sensitive to risk for most financial institutions, but not for the largest

financial institutions, and that this "too big to fail" relationship between firm size and the risk sensitivity is not seen in the non-financial sectors.

Our paper complements these studies by examining the pricing of China's shadow banking products. Implicit guarantee is more complicated in China, however. Investors believe the guarantee is not only provided by the sponsoring financial firm, but also the distributing bank, their controlling shareholders, and the central government. Consistent with the literature, we document that the spread level and its risk sensitivity varies with the strength of implicit guarantee. Our evidence suggests that despite the concern that Chinese investors are not sophisticated and inexperienced with financial markets, they are able to distinguish the different risk associated with the underlying investments.

There has been a growing literature on China's shadow banking, although evidence is lacking on both issues we focus on: the underlying investments and the effects of implicit guarantee. Wang, Wang, Wang, and Zhou (2016) and Hachem and Song (2016) provide theoretical explanations for the growth of the sector. Chen, He, and Liu (2017) argue that China's stimulus package in 2009 and the need to roll over the related bank loans led to the rapid growth of the sector. Allen, Qian, Tu and Yu (2017) and Chen, Ren, and Zha (2016) study entrusted loans, another important form of shadow banking in China. More closely related to us, Allen, Qian, Tu and Yu (2017) examines the underlying investments of entrusted loans. They point out that different subsectors of shadow banking can have very different risks. Hence our investigation of the real investments of trust products add to the understanding of overall risk of this sector. In addition, we provide evidence that the growth of the sector is partly driven by the financing gap in the real estate industry. Acharya, Qian, and Yang (2016) show that banks issue WMPs for the purpose of regulatory arbitrage. They also document that the yields of WMPs depend on the risk of the sponsoring bank, suggesting that investors price in the implicit guarantee provided by the bank. Nonetheless, they do not examine the impact of

implicit guarantee on spread-to-risk sensitivity, nor do they consider the different dimensions of implicit guarantees.

2. Institutional background

2.1 Traditional banking and shadow sector in China

China used to have a bank-dominated financial system, with a lagging developed non-bank financial industry. However, recent years saw the fast growth of non-banking financial sector, including the securities industry, insurance industry, trust industry, as well as other small-scale lending companies (See, e.g. Allen, Qian and Gu, 2015; 2017), part of which is also the main component of the remarkably expanding shadow sector. Several recent studies explore the underlying factors that have given rise to the growth of shadow banking (e.g. Hachem and Song, 2016; Allen, Qian, Tu and Yu, 2017; Chen, He and Liu, 2017). The core reason is that China's financial system is still repressive. For instance, previously the key interest rates remain tightly regulated by the PBOC[4]; banks' lending amount is restricted by the liquidity rules; and the capital markets are still far from developed. These dynamics generated demand for and supply of funds outside the traditional banking system.

Since the real lending rates are regulated and relatively low, there is an excess demand for credit, which creates room for the governments to exert allocation of bank credit. For instance, in general, they favor more state-owned enterprises (SOEs), government-affiliated entities (e.g. local government financing platforms) or large companies. Even without explicit government influence, the financial institutions would probably show similar preferences in their loan granting as SOEs and government-affiliated entities are more stable and can more easily get the implicit guarantee from the governments in the event of tail risks. Therefore, the flip side

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[4] Interest rates had been tightly regulated in China. As part of the macroeconomic policies, the PBOC sets base interest rates along with upper and lower ceilings. In recent years the PBOC started to liberalized both the lending and deposit interest rates and the upper ceilings of the deposit rates was finally removed in 2015

of the story is that other enterprises, especially the SMEs and the enterprises in the government-regulated industries (e.g. real estate industry or the industries with excessive capacity), are likely excluded from the lending decision process.

In the meanwhile, the CBRC also sets limits on total bank lending, including the capital ratio and loan-to-deposit ratio (LDR), in response to commercial banks' strong incentives to engage in excessive lending. In order to maintain a high-level of capital ratio and depress the LDR level, banks start to conduct more off-balance sheet activities such as issuing wealth management products (WMPs) and other non-standard debt assets, such as interbank activities and trust products through cooperating with trust companies (See, e.g. Hachem and Song, 2016; Acharya, Qian and Yang, 2016).

On the other hand, compared to the lending rates, the deposit rates were also regulated till 2015 and stayed at a very low level. These interest rate policies also partly drive the investment-oriented growth model in China, which forced transfers from savers to borrowers (e.g. Song, Storesletten and Zilibotti, 2011). In fact, the real deposit rates returned to negative territory again in recent years, which coincided with the housing price rally. If the households cannot invest their savings in the stock market or the housing market, they have to find alternative ways to preserve value. In this sense, informal lending and different types of wealth management products become favored options.

2.2 The history and recent development of the trust industry

Trust financing is not entirely a new phenomenon in China's financial industry. In 1979, when the opening-up policy and economic reform had just been launched, the State Council issued a guidance to develop trust businesses, which followed by the establishment of China International Trust and Investment Corporation (CITIC) in October 1979. In the following years, the central government and many local governments also set up a large number of trust

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and investment companies (TICs), most of which just engaged in actual deposit and lending activities.

However, from 1982 to 2001, the government implemented five rounds of cleaning and consolidation of the TIC industry. The first round occurred in 1982. All the entities other than those authorized by the State Council, were prohibited to establish TICs and were ordered to close down their TICs within a given period. However, in 1983, the policy changed again, when the government encouraged TICs as long as they were beneficial to the introduction of foreign capital and the advancement of technology, which led to a period of rapid growth of TICs, extraordinary expansion of fixed asset investment and finally overheating of the economy. The following rounds of cleaning and consolidation were called up by the PBOC when the economy showed signs of overheating in 1985, 1988 and 1993. The fifth round of consolidation, starting from 1995, was primarily a response to the weakening financial positions of the TICs, calling for separation of traditional banking and trust businesses and tighter regulation. For instance, in 1995, the State Council approved separation of trust business under the Big-4 banks (ABC, ICBC, BOC and CCB) from the banks. Overall till then, the development of TICs had been quite volatile and they complemented commercial banks in providing investment projects and supporting economic growth, which in several periods also led to overheating issues and increased financial risks. When economic growth slowed down, many TICs ran into significant financial difficulties and became insolvent in the end. A large number of high profile TICs went bankruptcy in late 1990s[5]. In 2001, the People's Congress launched and approved the "Trust Law", which officially paved the road for subsequent development in China's trust industry.

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[5] Later from 1997 to 2000, the PBOC closed China Rural Development Trust Investment Corp., China New Technology and Entrepreneur Trust Investment Corp., Guangdong International Trust Investment Corp. as well as China Education and Technology Trust Investment Corp.

Since the introduction of the "Trust Law", the trust industry has been growing slowly before 2008's global financial crisis. Figure 1 shows the total issuance of trust products ever since 2002. The average expected yields stayed around 5% during this period. Since the global financial crisis, because of the reasons mentioned in the previous section, China's shadow banking sectors have been growing dramatically and the trust industry is one of the fast-growing sectors. In 2008, the "Four Trillion Package" with a large number of newly-established infrastructure projects was launched by the government to stimulate the economy. However, because of the LDR rule and the following high demand to roll-over the due debt, the CBRC issued a guidance to support and set regulation rules for cooperation between banks and trust companies, which allows banks to issue loans through the off-balance channels such as trust companies. In the meanwhile, in order to curb the overheating of housing market and the overcapacity in specific industries, the bank lending activities to certain areas (e.g. real estate, mining, iron and steel industry, cement industry, etc.) were also restricted through the PBOC's window guidance[6], therefore banks have strong incentives to remove these businesses off the balance sheet. As Figure 2 suggests, the trust industry has overtaken the insurance industry as the largest sector in non-banking financial sectors since 2012, with the total assets amounted to 16.7 trillion at the end of 2015. By the end of 2015, the ratio of the outstanding total trust assets to GDP arrives at 23.7%, as shown by Figure 3.

Trust financing is mainly intermediated through a trust company, which provides funding to a project company at market interest rate by issuing trust wealth management products to the investors. The involvement of commercial banks includes sometimes being the channel for

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[6] In accordance with the requirement for differentiated credit policies, the PBOC usually guides financial institutions to enhance financial support to key industries such as energy conservation, environmental protection, and emerging strategic industries and service sector; in the meanwhile also guides to cut back lending to high energy-consuming and polluting industries, and industries with overcapacity and restricted unauthorized lending to local government financing platforms as well as housing market (See, e.g. Allen, Gu, and Qian, 2017). In early 2010, it was reported by some commercial banks that the PBOC started to tighten the bank credit to housing market. See, for example: http://finance.people.com.cn/GB/10982794.html

sale of these trust products as well as introducing their clients to the trust company. There are various forms of detailed organization of such trust financing and as returns trust companies and banks share the commission fees. In some occasions the banks as introducers will invest its own non-guaranteed WMPs in these trust products. In 2010, the funding for roughly 70% trust assets comes from money that has already been pooled together by other institutions in such way, referred to as money raised through Single Capital Trusts (SCTs) (Hachem and Song, 2016). Therefore, this type of trust products is highly intertwined with the banks involved. The other trust products are either the Collective Investment Trusts (CITs), as standardized products sold to multiple investors or the Property Management Trusts (PMTs) involving the management of non-monetary assets. In August 2010, to regulate the bank-trust cooperation, the CBRC announced that the WMPs could invest at most 30% in trust loans. Hence, the ratio of SCTs has been decreasing in recent three to four years but still stays above 50%, which indicates still close binding between banks and trust companies. The other form of trust financing is that a trust company creates a trust project with different tranche structure-senior-tranche debt and subordinated-tranche equity. A company who sets up the project company would often take the equity tranche. Investors in the trust products, often the public, will get a minimum return plus some profit sharing sometimes.

2.3 Recent regulation change on bank-trust cooperation

Due to the extraordinary growth of the shadow banking and the potential risks, the CBRC started to crack down on direct bank-trust cooperation in 2010, by requiring that first, the WMPs can investment at most 30% in trust loans, as mentioned above; second, banks should move back off balance-sheet assets related to trust-bank cooperation by the end of 2011; and third, large banks should set aside risk-weighted capital as 11.5% for trust loans extended in the SCTs that are not included in banks' balance sheet, and small banks should set aside 10%

capital as for trust loans extended in the SCTs. In 2011, the CBRC further required that trust companies would not be allowed to distribute dividends if the trust compensation reserve is less than 150% of its non-performing loan or 2.5% of the trust loans extended in the bank-trust cooperation.

In 2013, the CBRC went even further and announced that bank WMPs could invest at most 35% in non-standard debt asset including all trust assets. In response, banks and trust companies started to develop the counterpart business to get around the new regulation. First, the WMP issuing bank places WMP money in another bank or bank-affiliated off-balance-sheet vehicle so the WMP is said to be backed by interest rate products, not directly by trust assets. Then the trust company comes and issues beneficiary rights to the recipient of the placement who then uses the cash flows to repay the placement interests (See also, e.g. Hachem and Song, 2016). In this case, these assets are only counted as interbank assets, not the "actual" trust loans that should be restricted by the new regulation.

3. Data and summary statistics

3.1 Our sample

Our sample covers all the trust products with public information issued by the total 68 trust companies from 2002 to 2015. We obtain our data from multiple sources. First, the detailed information on trust companies and products is from iFind, a leading financial market research database in China. The trust companies are required by the CBRC to release annual financial reports and shareholder information. The CBRC also sets the regulation that requires all the Collective Investment Trusts (CITs) to disclose product information such as expected yield, maturity, issuance volume, tranches, investment threshold to the investors either through official website or through sale channels (e.g. banks). However for the Single Capital Trusts

(SCTs), the information disclosure is not mandatory. Therefore, our sample covers all the CITs and some of the SCTs with issuance information.

Second, we also hand collect the borrower information for the trust products through trust issuance reports. The majority of borrowers are private firms. Through manually searching in the issuance reports, we are able to identify the borrower's name, industry and headquarter location. Then we match the borrower's name with the information at the National Enterprise Credit Information Publicity System (NECIPS) and get the borrowers' up-to-date registered capital.

Third, we also retrieve the provincial-level economic information from WIND, also a leading and widely-used financial research database in China. The information on treasury bond yields is from China Bond[7].

Then we merge together different datasets. The trust firm's financial data as well as shareholder information in year *t-1* are matched with the products issued in year *t*. Similarly, the provincial economic data in year *t-1* are matched with the products issued in year *t*. Then we drop the products without expected yield information at issuance. In this way, we are able to obtain a sample covering 25,397 trust products issued by 68 trust companies from 2002 to 2015. Then we use borrowers' name to match the registered capital information at the NECIPS. However, since there is no mandatory requirement of information disclosure on borrower's name upon issuance, we only get the borrower's name and its size for 10,609 products. This is especially the case for the products in "others" industry which covers multiple sectors and those in "securities market". For the products in real estate, infrastructure, C&I and financial institutions, we get 65.9%, 33.6%, 63.7% and 24.3% that have information on borrower size, of those in the full sample.

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[7] The official website of China Bond: http://www.chinabond.com.cn/d2s/index.html

3.2 Measures of product characteristics

Table 1 Panel A presents the summary statistics for the product characteristics. See Table A.1 for detailed definition for all the variables. *Expected yield* is the yield marketed in the product prospectus, ranging from 0.08% to 44.26% with a mean value of 8.99%. *Yield spread* is defined as the difference between expected yield and a matched averaged 1-year treasury bond yield based on the month of the product issuance. We use monthly treasury bond yield to avoid the possible excess price volatility. The *yield spread* ranges from -3.63% to 41.51% with a mean value of 6.00%. *Maturity* of the trust products ranges 0.20 months (6 days) to 300 months (25 years) with a mean value of 20.52 months (1.7 years). The *issuance vol.* of the trust products ranges from 0.50mn RMB to 13bn RMB, with a mean value of 128.46mn RMB. In our product sample, 4,972 products (20%) are structured with senior and subordinated tranches. Over 40% of the products are trust loans, while most of the structured products are trust equity-financing products. 582 products (2%) are open products, which can be redeemed on the specified dates before the maturity date. For the sale channels, 2,440 products (10%) are sold through the Big-5 banks and 8,251 products (32%) are sold through the non-Big-5 banks, with the remaining products sold through other channels such as the issuing trust companies. *Borrower_regcap* ranges from 0.03mn to 68,821.1mn, with a mean value of 1,070.2mn. The majority (97.9%) of the products in our sample are issued by unlisted firms.

Based on the shareholder information, we classify the trust companies into three groups. central SOE controlled or local SOE controlled trust companies are those with a central SOE or local SOE as the controlling shareholder, respectively. The other trust companies are non-SOE controlled. Table 1 Panel B reports the product characteristics by different groups of trust companies. The average product yield of non-SOE controlled trust companies is 9.89%, higher than that of central SOE controlled (8.78%) and that of local SOE controlled companies (8.65%). The average yield spread shows a similar trend. The average product maturity of non-

SOE controlled trust companies is 21.00 months, slightly longer than that of central SOE controlled (20.23 months) and that of local SOE controlled companies (20.03 months). As for issuance volume, the products issued by the central SOE controlled companies have the highest average amount in different groups, followed by those issued by the local SOE controlled and then the non-SOE controlled companies. In terms of product number, the percentage (11.61%) of products sold via the Big-5 banks for central SOE controlled companies is higher than that for local SOEs controlled and non-SOE controlled companies (10.55% and 7.90% respectively).

Table 2 reports the distribution of sale channels of the trust products in our sample in terms of issuance amount. *Sold by Big5* identifies the products that have been sold by the Big-5 banks. *Sold by non-Big5* identifies the products that have been sold by non-Big5 commercial banks in China, while *Sold by nonbank* identifies the products that have been sold through the channels other than commercial banks. The statistics show that, central SOE controlled companies have 11.16% of the products sold through the Big-5 banks, while local SOE and non-SOE controlled companies have 9.75% and 7.48%, respectively.

3.3 Measures of firm characteristics

Table 1 Panel C reports the summary statistics of the trust company characteristics for the firm-year sample from 2002- 2015. The mean value of *Reg_cap* is 2.98bn RMB, with a standard deviation of 2.47bn RMB. The *trust_assets* ranges from 2.6bn to 1.10tn RMB, with a mean value of 147bn RMB. The *Equity* ranges from 92mn RMB to 56bn RMB, with a mean value of 3.13bn RMB. *Netcap/riskcap* (net capital ratio) ranges from 39.29% to 996.81%, with a mean value of 215.58%.

4. Why fast growth of trust products?

4.1 Product distribution and hypothesis

We first investigate what types of firms are borrowing from trust companies. Table 3 reports the industry distribution of the borrowers in our sample. We employ the categories by the China Trustee Association to identify the borrowers' industries. According to their definition, the products in "other" industry are those investing in multiple (two or more) industries[8]. Overall real estate is the most invested industry. From 2002 to 2015, 24.33% of the funds raised by trust products (amounted at 607.2bn RMB) went to borrowers in the real estate industry. 21.84% flowed to borrowers in "other" industries, followed by 18.95% to commercial and industrial firms, 18.22% to infrastructural firms, 11.71% to financial institutions and 4.95% to securities market. Taken together, from 24.33% to 41.80% (24.33%+0.8×21.84%) of the funds (amounted at 1043.37bn RMB at most) went to real estate industry. Figure 4-A presents the total issuance by industry and through quarters in our samplek[9]. Overall, the total issuance in our sample has been rising fast since 2009, especially that in real estate industry. The issuance volume in financial institutions has been growing in recent years, which was triggered by the cooperation among different sub-sectors in non-banking financial industry and the rise of asset securitization in China[10]. The volume in infrastructure stays relatively stable on average.

Figure 5 shows the industry distribution of different types of trust companies over the years from 2002 to 2015. For central SOE controlled companies, 29.90% of the raised funds flowed to real estate industry, followed by 23.20% to "others" industry, and then 18.07% to commercial and industrial sectors. The local SOE controlled companies have invested 24.67% of the funds raised through trust products into "others" industry, 17.98% into real estate and 17.73% into commercial and industrial sectors. For the non-SOE controlled trust companies,

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[8] After going through the announcement files of the trust products in the industry of "others", we find over 80% of the products have invested in the real estate market.

[9] As we dropped the products without expected yield information, therefore the total issuance of our product sample is lower than that shown in Figure 1, which is the total issuance of the CITs and SCTs with available information in the trust industry.

[10] Please see also, the "China Trust Industry Development Research Report (2015)" by CITIC Trust.

real estate is also the first investment target with highest investment ratio, followed by infrastructure and then commercial and industrial sectors.

Therefore, as a main part of shadow banking, the fast growth of trust industry should also be related to the fund shortage in the real estate market, as well as the economic growth of the provinces where the borrowers are located. For instance, Allen, Qian, Tu and Yu (2017) find that the non-affiliated entrusted loans, which is another large component of shadow banking, mostly flow into the real estate industry with a much higher interest rate than the official bank loan rates. However, the housing market growth, reflected by the housing price, is strikingly different among different provinces or cities. Hence, we then explore the geographical distribution of the trust borrowers.

Figure 4-C, Figure 6-A and 6- B, show the provincial distribution of trust products over the years by product number and issuance volume. Beijing, Jiangsu and Sichuan are the three provinces with highest issuance volume of trust products, followed then by Guangdong, Zhejiang and Chongqing. Guangxi, Xizang (Tibet) and Ningxia are the provinces with lowest issuance volume. In terms of product number, Sichuan, Jiangsu and Beijing rank the highest three, with Hainan, Ningxia and Xizang (Tibet) being the lowest three.

There have been some anecdotal evidences suggesting that the key drivers of the shadow banking growth should be the substantial policy stimulus after the global financial crisis as well as the growth in the real estate market. Acharya, Qian and Yang (2016) show that the fiscal stimulus package triggered the rise of bank WMPs. However, there has been few empirical evidence testing the direct relationship between housing market and shadow banking. A theoretical paper by Dang, Wang and Yao (2016) point out that the abrupt policy change after the overheating of the real economy in late 2010 triggered the government's change of policy which includes the cut-back of stimulus and the reduce of bank credit. However, the long-term nature of the investments in infrastructure as well as those in real estate required continued

credit infusion, without which there would likely be wide-spread project failures and even rise in non-performing loans. As a response, banks had to further expand their off-balance sheet operation through the channels of shadow banking. Hence, we hypothesize that the trust issuance should be a supplement to real estate loan to fulfill the capital needs from the real estate industry. As a result, both the fund shortage and the housing price should be the key drivers of the trust industry development.

To test this hypothesis, we estimate the following model:

$$Log\_tiss_{i,t} = \beta_0 + \beta_1 GDP\_growth_{i,t-1} + \beta_2 \log\_reiv_{i,t-1} + \beta_3 \log\_reloan_{i,t-1} +$$

$$\beta_4 Reinv/reloan_{i,t-1} + \beta_5 \log\_hp_{i,t-1} + year_t + province_i + e_{it} \qquad (1)$$

where the dependent variable is the provincial-level of trust product issuance (in mn RMB). *GDP_growth* is the real growth rate of the provincial GDP. *Log_reinv* is the logarithm of provincial real estate investment. *Log_reloan* is the logarithm of provincial real estate bank loans. *Reinv/reloan* is the ratio of real estate investment to real estate loan. *Log_hp* is the logarithm of provincial-level housing price. We control for both year fixed effects and province fixed effects in the regressions, We use the lagged value for all the independent macro-economic variables.

4.2 Empirical results

Table 4 presents the results for model (1). From column (1) to (3), we only include GDP growth, real estate investment and real estate loan, and it turns out that only real estate investment shows a significant positive association with trust issuance (in column (3)). From column (4) to (6), we also introduce the ratio of real estate investment and loan as well as the housing price. The intuition is to see how fund shortage (the gap between real estate investment and loan) and housing price can explain the variation in trust issuance as our hypothesis. Consistently, we find that these two factors have significantly positive impact on the trust

issuance at the provincial level. The coefficient of the ratio (*Reinv/reloan)* is significant and positive in both column (4) and (6), suggesting that provinces with higher real estate investment needs but lower real estate loans are issuing more volumes of trust products. In terms of economic magnitude, 140% increase in *Reinv/reloan* leads to 495.98mn (2987.86mn×16.6%) increase in total issuance. The coefficient of the *log_hp* enters with significant and positive sign, suggesting that the higher the housing price is, the more the trust issuance would be. In terms of economic magnitude, one percentage increase of housing price can bring about 2.6 percentage increase in total issuance. For robustness, we also run the regressions for real estate products (from column (7) to (10)). The results confirm with our hypothesis that the trust issuance complements to the bank credit significantly in the real estate industry.

5. Product pricing and the role of implicit guarantee

Does the pricing reflect the underlying borrowers' risks of trust products, the issuing trust companies' risks as well as the market risk? Moreover, how does the government implicit guarantee play a role in the ex-ante pricing? In this section we examine the determinants of the initial pricing of China's trust products.

5.1 Does the ex-ante pricing reflect risks?

From the investors' side, one of the important features in China's wealth management products (including both the bank WMPs and trust products) is the expectation of government support. If we compare the trust financing in China and subprime debt in the US, there are indeed some similarities. In both cases, investors are attracted by potential high return investment opportunities, while at the same time investors have limited knowledge about the underlying assets but relied on government guarantees. However, one of the main differences between these two products is the investors. In the subprime market, financial institutions are

the main players, while Chinese individuals are the main participants in investing in the collective trust products[11]. Therefore, it is actually even more difficult for Chinese retail investors to conduct due diligence for the underlying assets although the structure of trust products is relatively simple compared to the design of the subprime debt, not to mention that the majority of the products were issued by private firms. However, Chinese retail investors perceive trust products as safe investments because banks and government-owned entities are involved in structuring and distributing these products. Although neither banks nor trust companies are contractually liable when underlying borrowers do not repay, investors expect implicit guarantees by banks and government in the event of defaults.

Therefore, if the trust financing collapses, based on its intricate connection with both the traditional banking sectors and the individual investors, it could lead to contagion. If the implicit guarantee becomes explicit, either the trust company or its controlling shareholder (a SOE or a bank) are supposed to pay for the loss, which would pose additional risks on the trust companies given their current high leverage[12], or even trigger contagion and systemic risks in the financial system. Hence, it would be important to see whether the product pricing reflects the potential risks or whether there are neglected risks for these trust products, and whether investors expect implicit guarantees in the initial pricing.

To examine the ex-ante pricing of trust products, we consider the characteristics of both the products and the issuing trust company, as well as the borrowers' risks. To measure the product characteristics, we consider the maturity, whether it is structured with senior/subordinated tranches, whether it is open for redemption before the maturity date, whether it has collaterals, whether it is distributed by banks or non-bank institutions, as well as the minimum investment amount for investors. To measure the characteristics of the issuing

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[11] In general, the trust products are mostly designed for wealthy people. For most of the trust products, the minimum investment amount for investors is at least 1 million RMB.
[12] In 2015, the leverage ratio, measured by the trust assets to equity, ranges from 33.3 to 203.8, with a mean value of 46.5.

trust company, we consider the size, net capital ratio and the company's controlling shareholder- whether it is a central SOE or a local SOE[13]. To measure a borrower's risks, we consider the registered capital as borrower size, the affiliated industry and the location (province) of borrower's headquarter. We hypothesize that if the product is issued by a trust company with a SOE (Central or Local SOE) as the controlling shareholder, the investors would expect more implicit guarantee from the government.

In order to test the hypothesis, we estimate the following model:

$$Product\ yield\ spread_{i,t} = \beta_0 + \beta_1 Product\ characteristics_{i,t} +$$

$$\beta_2 Trust\ firm\ characteristics_{i,t-1} + \beta_3 Borrower\ characteristics_{i,t-1} + year_t +$$

$$Trsut\ firm_i + e_{it} \qquad\qquad (2)$$

where the dependent variable is the product yield spread, which is the difference of the product expected yield and the matched 1-year treasury bond yield. The product characteristics include *Maturity, Structure*, *Open*, *Log_inv_threshold* , *collateral*, *sold_by_big5* and *sold_by_nonbig5*, and trust firm characteristics include *central SOE, local SOE,* and *log_reg_cap*. Borrower characteristics include the *Log_borrowersize*, *GDP growth* and *affiliated industry*.

Table 5 presents the regression results for model (2). The model exploits cross-sectional as well as within trust company time variation. In column (1) we include the product-level, firm-level and borrower-level characteristics except the borrower size, as including it will reduce our sample by about 51.4%. The results suggest that, first of all, if the product has longer maturity, is structured with senior/subordinated tranches, not open for redemption in specified dates, issued with higher minimum investment amount, or with collateral, then the yield spread

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[13] We only report the results without net capital ratio in the regressions as including the ratio reduces our sample of products largely as the capital regulation for trust companies was only set by the CBRC in 2010. In August 2010, the CBRC issued a guidance on the net capital ratio requirement for trust companies (Doctrine 5), which requires trust companies to release net capital (The net capital should not be less than 0.2bn RMB, and should be higher than 100% of the total risk capital and 40% of net assets). http://www.gov.cn/flfg/2010-09/10/content_1699764.htm Since 2010, some trust companies have started to release net capital (ratio), but still not all the trust companies are revealing this information through annual reports. However, including the net capital ratio did not change our main results although the sample is smaller.

is higher at the 1% level of significance. Second, *ceteris paribus*, if the product is sold by a Big-5 commercial bank, then the yield spread is significantly lower for 3.1% (0.205/6.00) at the 1% level. Third, if the product is issued by a central SOE controlled trust company, the yield spread is lower by 14.6% (0.875/6.00), significantly at the 1% level ; if the product is issued by a local SOE controlled company, the yield spread is lower by 9.9% (0.594/6.00), significantly at the 1% level; and moreover, if the product is issued by a larger trust company, then the yield spread is significantly lower also at the 1% level. Fourth, using C&I sector as a benchmark, borrowers in real estate industry tend to be riskier with the yield spread being significantly higher, while those in infrastructure, financial institutions and other industries tend to be less risky with the yield spread being significantly lower. The products investing in securities markets tend to be the least risky ones on average in our sample. In column (2) we include further the *Log_borrowersize*, so our sample observations decrease from 16,406 in column (1) to 8,436. We get consistent estimates for all the other variables with those in column (1). The coefficient on *Log_borrowersize* suggests that the risk of the underlying borrowers has been priced in. That is, for larger borrower, the yield spreads are significantly lower at the 1% level. Column (3) and (4) report the results for the regressions with the same set of variables but further include the trust company fixed effects. We find that the main results are still consistent with those in columns (1) and (2).

5.2 The stock market crash in 2015's summer and product pricing

Then, we examine whether the down-side risks in Chinese capital market change investors' risk preference and affect the ex-ante pricing of trust products. In the few years leading up to 2015, China's stock market had been viewed in an increasingly favorable light and the prices are strongly linked to firm fundamentals (Carpenter, Lu and Whitelaw, 2016). The stock market, however, had a bubble-like run from late 2014 to the summer of 2015. The market

plunged on June 12, 2015 and was almost frozen in the beginning of July. As we have shown in previous sections (See also, Figure 4-A) , the volume of the trust products investing in securities market has been growing remarkably since 2014, partly attracted by the booming of equity market and the slow-down of real estate market. For the trust products that have been invested in securities market, one of the most prevalent structure is the "umbrella trusts", with which the trust companies transform an equity investment into a structured product that yields a fixed return. Usually the products compose of different tranches. Banks purchase the senior tranche, which sometimes guarantees a fixed return and is further distributed to clients as bank WMPs. Hedge funds, securities firms and other financial institutions subscribe to the subordinate tranche, which absorbs the first losses from stock investments but enjoy all the excess returns. Subordinate tranche investors were effectively borrowing money from senior tranche holders to make leveraged stock bets[14]. The yield that subordinate tranche holders pay on the margin loans comprises the fixed returns paid to the senior tranche.

However, with the popping of the stock market bubble, some of these products encountered huge losses[15]. Therefore, we assume that the trust companies that have issued higher volume of products in securities markets would probably have more potential default issues after the stock market crash even if their controlling shareholder is a central SOE. Here, we use the stock market crash as a negative shock to see whether investors price in these potential risks that the trust companies could meet.

In order to smooth issuance volume increase before the crash which can be mostly attributed to the stock market soaring, we consider from 12 months before the stock market crash to 6 months after and then do the yearly average to see the change of issuance volume.

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[14] Before the stock market crash, there was no regulation on the leverage that the subordinate tranche investors can make. After the deleveraging of the stock market, in March 2016, the CBRC announced a new regulation (Doctrine 58), which allows the highest ratio of senior tranche to subordinate tranche (in RMB amount) to be 2:1. In other words, the highest leverage that subordinate investors can use are 300%.

[15] Some of these products were due and default after the stock market crash. Xin Hua News reported some of such default cases. See: http://news.xinhuanet.com/finance/2016-06/18/c_129072709.htm

Stk_crash is defined as 1 if the product was issued between July 15, 2015 to the end of 2015, and 0 if the product was issued between May 1, 2014 and April 30, 2015. We exclude the products issued between May to June 2015, right before the crash, as we assume the pricing of the products during this period could be very noisy. To isolate the observable differences that the trust companies with higher issuance volume of securities market products and those with lower issuance volume, we first identify ten treated companies that issue most products in investing in securities market in the 12 months prior to the crash. Then we find a matched firm for each treated firm by using one-to-one propensity score matching based on the average yield spreads and total issuance before the crash, as well as the ownership dummy (central, local and non-SOE). In the end, we are able to identify ten treated companies (Wanxiang Trust, CITIC Trust, Zhongjiantou Trust, Yunnan Trust, Xiamen Trust, Sichuan Trust, Tianjin Trust, CCB Trust, Bairui Trust, Changan Trust) and ten control companies (Zhonghai Trust, Zhonghang Trust, China Credit Trust, Wukuang Trust, BOComm Trust, Industrial Trust, Huaxin Trust, Huarun Trust, Daye Trust and Shandong Trust).

Table 6 reports the regression results on the effect of stock market crash on the product pricing, both without and with trust company fixed effects. In column (1) *stk_crash* enters with a strong positive coefficient, indicating that after the stock market crash, on average the initial yield spread is significantly higher. In column (2) the coefficient on *stk_crash* still stays positive at the 5% level of significance. The coefficient on *treated*, shows that *ceteris paribus*, the yield spreads of the products issued by the treated companies are 19.7% (1.180/6.00) higher. The interaction term (*treated*stk_crash*) is also positive at the 10% level of significance, indicating that after the crash, the yield spreads of the products issued by the treated companies are even 9.0% (0.542/6.00) higher. In Column (3) to (4) we introduce the trust company fixed effects. The results show that on average within company the yield spreads are not significantly different from before to after the crash. However, the interaction term still

enters with a strong positive coefficient, indicating that for treated companies, the yield spreads are 23.2% (1.389/6.00) higher after the crash.

6. Robustness

In this section, we further conduct a set of robustness checks to see whether the ex-ante yields reflect the borrowers' risks and how does the expectation of implicit guarantee affect the pricing.

6.1 Effect of implicit guarantee on risk sensitivity of product pricing

An expectation of implicit guarantee would weaken investors' incentives to evaluate and price the risk of underlying borrowers. Therefore, we use subsamples defined by state ownership (Central vs. Local vs. Non-SOE), sale channels of the products (Big-5 vs. others) or issuing trust company size (Large vs. small trust company) to further explore the effect of implicit guarantee on the risk sensitivity of product pricing. We mainly use borrower size, industry and GDP growth to measure borrowers' risks. On average products in real estate are expected to be riskier than those in other industries. We hypothesize that the ex-ante pricing should be less sensitive to borrowers' risks for products issued by Central SOE controlled trust companies or large trust companies, or sold by Big-5 banks.

Table 7 presents the results on the risk sensitivity of ex-ante pricing. Panel A shows the results for subsamples of the products issued by Central SOE, Local SOE, and Non-SOEs. In column (1) to (3) we use the full sample of products while in column (4) to (6) we include *Log_borrowersize* so the number of sample observations has been reduced. The results suggest that the initial pricing of the products issued by Non-SOEs or Local SOEs are more sensitive to borrowers' risks than that by Central SOEs. In column (1) to (3), the real estate products issued by Central SOEs have 2.2%(0.130/6.00) higher yield spreads, while those issued by

Local SOEs or Non-SOEs have 11.2% (0.670/6.00) or 6.7% (0.403/6.00) higher yield spreads, *ceteris paribus*. The *Chi-sq* tests on the coefficients also suggest that the difference is significant at the 1% level. In column (4) to (6), the *Log_borrowersize* enters with an insignificant sign for the subsample of Central and Local SOEs (-0.0320 and 0.00954) and with a negative sign for the subsample of Non-SOEs (-0.0475), significantly at the 1% level. The coefficients of real estate industry dummy are consistent with those in column (1) to (3), while for the Central SOE subsample, the statistical significance is even lower after controlling for *Log_borrowersize*, further confirming that the products issued by the Central SOE controlled companies are less sensitive to the borrowers' risks.

Panel B presents the results for subsamples of the products sold by Big-5 or through other channels. The results point to the similar predictions. In column (1) and (2), the real estate products have 4.8% (0.287/6.00) higher yield spreads if sold by Big-5 banks while have 6.9% (0.412/6.00) higher yield spreads for if sold through other channels. In column (3) and (4) the *Log_borrowersize* enters with an insignificant sign for the products sold by Big 5 banks (-0.00311) and with a significant and negative sign for the products sold through other channels (-0.0260). The results suggest that the products sold by Big-5 banks are less sensitive to the borrowers' risks in terms of borrower size and industry.

Panel C presents the results for subsample of the products issued by large versus small trust companies, which are defined as the top and bottom 33% terciles of trust company size (the logarithm of companies' registered capital). In column (1) and (2), the yield spreads increase by 4.3% (0.256/6.00) if the real estate products are issued by large trust companies, while increase by 9.5% (0.568/6.00) if issued by small trust companies. The *Chi-sq* tests on the coefficients indicate that the difference is significant at the 1% level. In column (3) and (4), for the products issued by small companies, the yield spreads are significantly lower if the underlying borrowers are larger; while for the products issued by large companies, such

relation is not significant. Overall, these tests consistently suggest that with stronger expectation of implicit guarantee, the initial pricing of the trust products are less sensitive to the risk of the underlying borrowers.

Additionally, we also do the robustness check with the subsample of real estate products. To further identify the risks of the underlying real estate borrowers, we further introduce a variable *Hmarket_risk*, to measure the risk of regional real estate market. Following Glaeser, Huang, Ma and Shleifer (2017), the *Hmarket_risk* is calculated as the residual of the regression of housing price (adjusted by disposable income per capita) on GDP growth by province. The results in Table 8 suggest that on average the risk of the regional housing market has been priced in, while such effect is much less significant for the products issued by Central SOE or Local SOE controlled companies. The interaction of *Central SOE* and *Hmarket_risk* enters with a strong negative coefficient -0.125, significantly at the 5% level, and the interaction of *Local SOE* and *Hmarket_risk* enters with a less strong negative coefficient -0,122, significantly at the 10% level.

6.2 The first default case in January 2014

If there is a casual link between expectation of implicit guarantee and product pricing, we would expect that a negative shock to government support will affect the spread-to-risk relation. To identify this, we employ the first default case in China's shadow banking in the beginning of 2014 as a negative shock, and examine how such event changed investors' expectation of government support.

From late 2013, investors started to concern about the potential default risks of some trust products as the projects were running with huge loss. The first default case of in trust industry was a collective WMP (the so-called Credit Equals Gold No.1 Product) issued by China Credit Trust, whose controlling shareholder is the People's Insurance Company of China (PICC), a

central SOE in China. The product was issued on February 1, 2011 and due on January 31, 2014. The initial issuance volume of the 3 billion yuan (496mn USD) at an expected yield of 9.5% to 11% for different investment amounts. Based on the issuance statement, the money raised through the trust product was used to fund four coal-mine acquisitions in Shanxi Province, equipment updates and processing factories. However, till the end of 2011, only two of the four were in production and the company's owner in Shanxi was arrested in May 2012 for taking public deposits illegally. In January 2014, the market was highly concerned about the possible default as the ICBC, the sale-channel bank rejected entreaties to compensate the related investors[16]. Finally the China Credit Trust announced to be responsible for majority of the losses on the due date[17]. In the first half year of 2014, several trust products also encountered similar situation after the case of Credit Equals Gold No.1 Product.

We use this event as a shock to examine whether it alters the way how investors price the trust products as well as their expectation of implicit guarantee. Prior to this event, investors may have been sure that the governments or the state-owned banks would guarantee the obligation of trust products. However, in this event, both the sale bank (ICBC) and the involved local government (Shanxi Province Government) rejected to take responsibility for the loss since there was no explicit commitment to do so. We interact the ownership dummy with post-default dummy to see whether investors still value the implicit guarantee from the governments or banks. The dummy *post-default* is defined as 1 if the issuance date is later than February 1st, 2014 and 0 otherwise.

Table 9 presents the results. In order to report the coefficients on the ownership dummy and the post-default indicator, we do not include trust company fixed effects as well as year

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[16] See also, the industry report "Questions and Answers on a potential default case in China's trust industry" by Goldman Sachs. Other comments by Bank of America Merrill Lynch in Hong Kong said that the first default of a trust product in at least a decade would shake investors' faith in their implicit guarantees and spur outflows that may trigger a "credit crunch". https://www.bloomberg.com/news/articles/2014-01-23/china-trust-products-gone-awry-evoke-soros-echoes-of-08-crisis

[17] For more details of this default case, please see also Zhu (2016).

fixed effects. In column (1) we run the yield spread regression with the full sample. *Post-default* enters with a strong positive coefficient (0.212) at the 1% level, showing that after the first default case, on average the product yield spread is higher by 3.5 % (0.212/6.00) holding all the else factors constant at their mean value. Two interaction terms (*Central SOE*post-default* and *Local SOE*post-default*), enter with strong negative coefficients (-0.637 and -0.333), both significantly at the 1% level, suggesting that during post-default period, Central SOE ownership reduces the yield spread for 10.6% (0.637/6.00), and the Local SOE ownership reduces the yield spread for 5.6% (0.333/6.00). The results suggest that after the first default case in China's trust industry, the yield spreads of trust products have been higher, while such effect is offset or mitigated by the state-ownership of the issuing trust companies. If the products are issued by a Central SOE controlled company, then the yield spreads are still significantly lower. In column (2) we run the regression with the propensity score matched sample as we assume there can be some observable differences for the products issued before or after the case which might drive our results. For each product issued during the post-default period, we find a control product during the pre-default period by using one-to-one propensity score matching based on product characteristics (maturity, issuance volume, structure, open and collateral) and size of trust firms. After matching we are able to identify 6,059 treated products and 6,059 control products. Using the matched sample we find that the main results still hold and the expectation of implicit guarantee from the central government gets even stronger.

6.3 The real estate shock in 2010 and product pricing

Then, we use a national-wide policy change in 2010 in real estate market to examine how a negative shock on asset pricing may change investors' attitude towards implicit guarantee. The last two decades witnessed the boom of China's real estate. However, the housing price

rose even faster since the government launch the massive fiscal stimulus plan in November 2008 to fight against the global financial crisis. In order to curb the speculative activities in housing market, the Central Government (the State Council) announced the "Order 10" ("Guo Shi Tiao") on April 15, 2010[18]. Following the guidance, on April 30, 2010, Beijing issued a rule restricting that only one additional property purchase per household in the city, becoming the first city adopting the "housing purchase restriction", soon also followed by other local governments.

The restriction imposed by the "Order 10" was one of the most strict regulation policies in China's real estate market in the last decade, inducing price decreased indeed for commercial and residential property during that period. Therefore, we examine whether the ex-ante pricing of real estate products reflects such a negative shock and further whether the expectation of implicit guarantee affects the relation. *RE_shock* is defined as 1 if the product was issued between May 2010 to April 2011, and 0 if the product was issued between April 2009 to March 2010, right before the announcement of the policy. In this way, we are able to identify 508 real estate trust products issued during this period. We also introduce the interaction of *RE_shock* and *ownership dummy* to examine the role of implicit guarantee. In order to the report the coefficients on *RE_shock* we did not include year fixed effects in the regressions.

Table 10 shows the regression results on the impact of housing purchase restriction. In column (1), *RE_shock* enters with a strong positive coefficient, indicating that after the restriction, on average the initial yield spread is significantly higher by 7.9% (0.472/6.89)[19]. In column (2) the coefficient on *RE_shock* (0.890) stays positive at the 5% level of significance. The coefficient of the interaction term (*Central×RE_shock*) is negative at the 5% level of

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[18] The State Council issued the "Notice on Resolutely Curbing the Soaring of Housing Price in Some Cities", which is well-known as the "Order 10" ("Guo Shi Tiao"), by stating that "… there has emerged a momentum of excessive rise in housing and land prices in some cities recently, and speculative purchase of housing has become active again, to which we need pay great attention…"

[19] In our sample, the average yield spreads for real estate trust products are 6.89%.

significance, indicating that after the restriction, the yield spreads of the products issued by the companies owned by a central SOE is even lower by 17.1% (1.024/6.89). The other interaction (*Local×RE_shock*) enters with negative but insignificant signs, indicating a weaker expectation of implicit guarantee. Overall the robustness checks using negative shocks to implicit guarantees and asset prices confirm with our baseline results that the implicit guarantee expectation flattens the spread-to-risk relation.

7. Conclusions

Much attention has been paid to the government implicit guarantees in financial sector since the recent global financial crisis. In this paper, we use a large component of China's shadow banking- trust industry, which is also the largest sub-sector of China's nonbanking financial industry, as a laboratory to study implicit guarantees and the rise of shadow banking. Our study shows that, the remarkably fast rise of trust industry is incurred by the financing gap in real estate and construction industry, similarly as that of the other shadow sectors. A largest portion of money raised through trust products flowed to the real estate industry. The pricing of the trust products reflects the potential risks of the underlying borrowers, and those of the issuing trust companies, as well as the market risk such as that incurred by the stock market crash. However, the expectation of implicit guarantees from governments reduces the yield spreads and also flattens the spread-to-risk relationship. After the shock of the first default case in 2014, the implicit guarantees from the central government still value for pricing. Given that the largest banks are state-owned in China, this paper also implies that strong dependence on government involvement in shadow banking appears to have been at the center of recent boom and might present a potential threat to financial stability.

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Figure 1: Total trust product issuance: 2002-2016

This figure plots the total trust product issuance and the average expected yields of the trust products from 2002 to May 2016 by quarter.
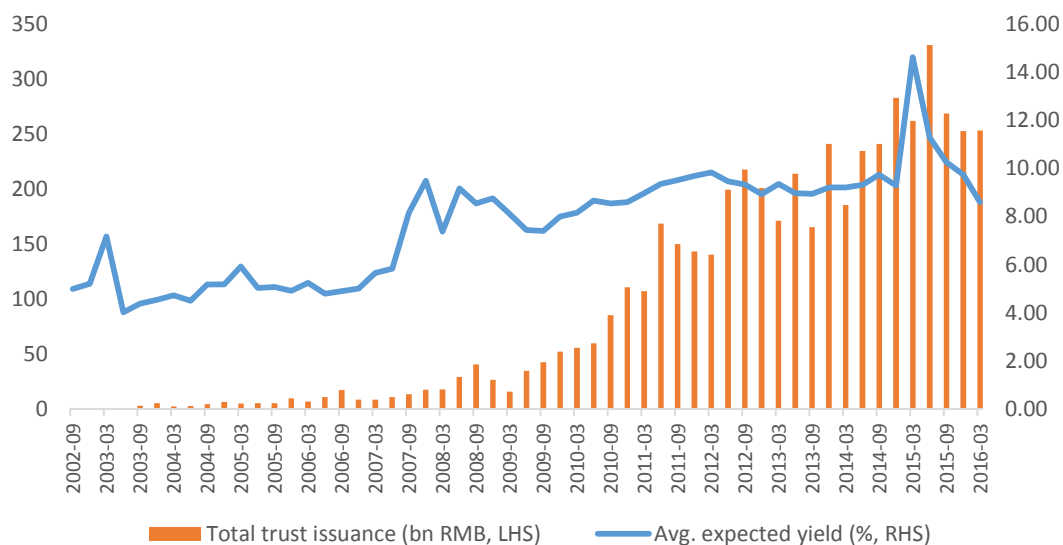
Source: China Trustee Association (data as of May 2016).

Figure 2: Comparison of total assets of China's non-banking financial industry

This figure plots the total assets of the sub-sectors of China's non-banking financial industry (trust, insurance and securities industry) from 2010 to 2015.

Source: CEIC.

33
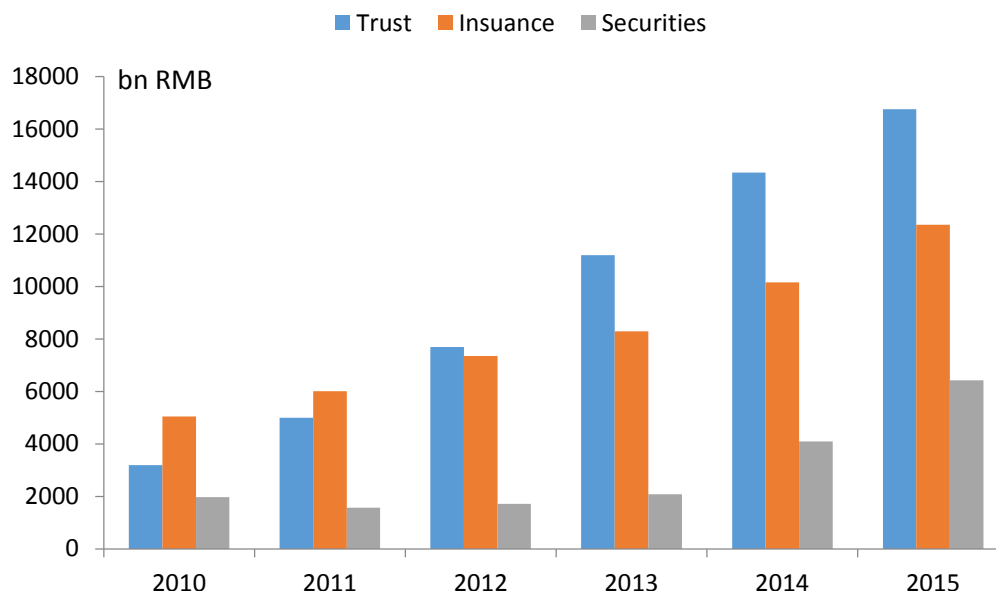
Figure 3: Growth of total trust asset volume as of GDP

This figure plots the ratio of total trust assets to China's GDP from 2010 to 2015.

total trust assets amount/GDP
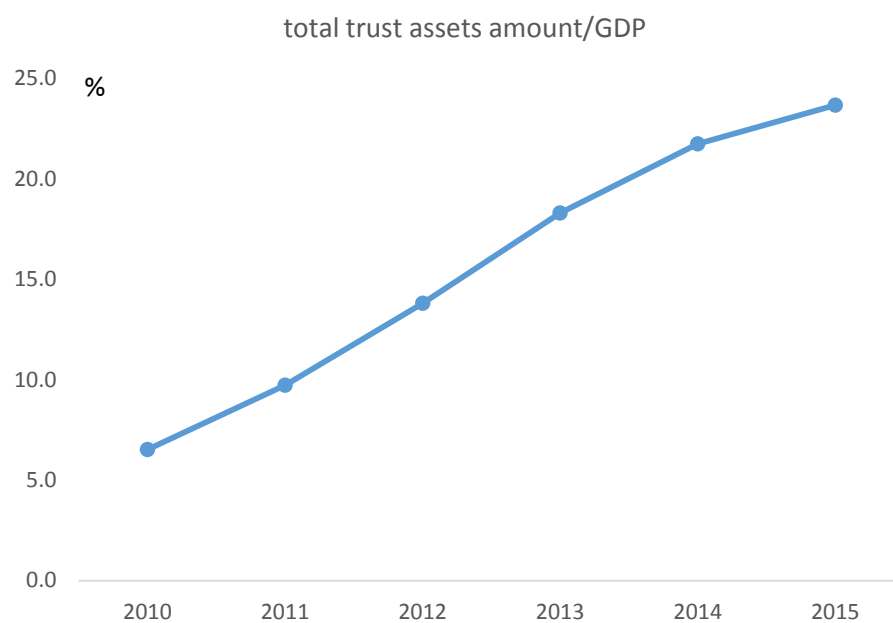
Source: China Trustee Association, National Statistics Bureau.

Figure 4-A: Total issuance of our product sample: by industry and quarter (2002-2015)

This figure plots the total issuance of our product sample by quarter the industry from 2002 to 2015 after dropping those without initial yield information.
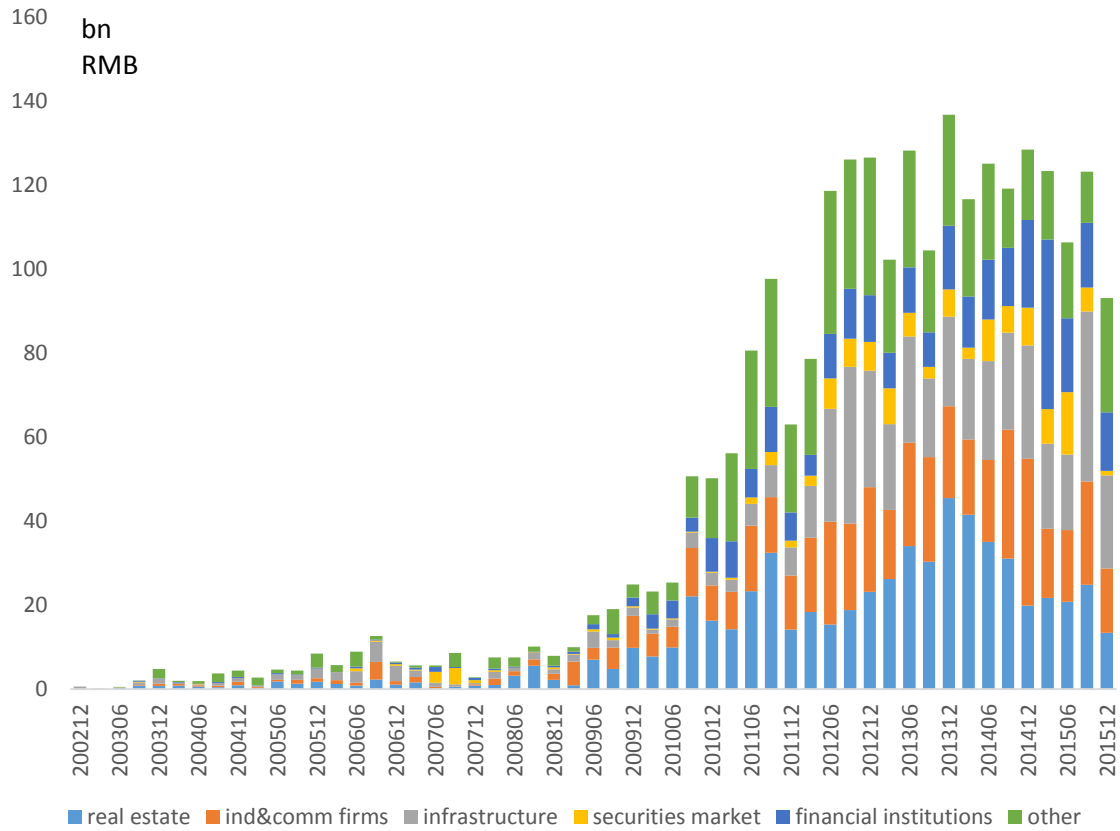
Source: iFind.

Figure 4-B: Distribution of total trust product issuance volume: by trust firm (2002-2015)

This figure plots the trust product issuance from 2002 to 2015 in our sample by trust firm.
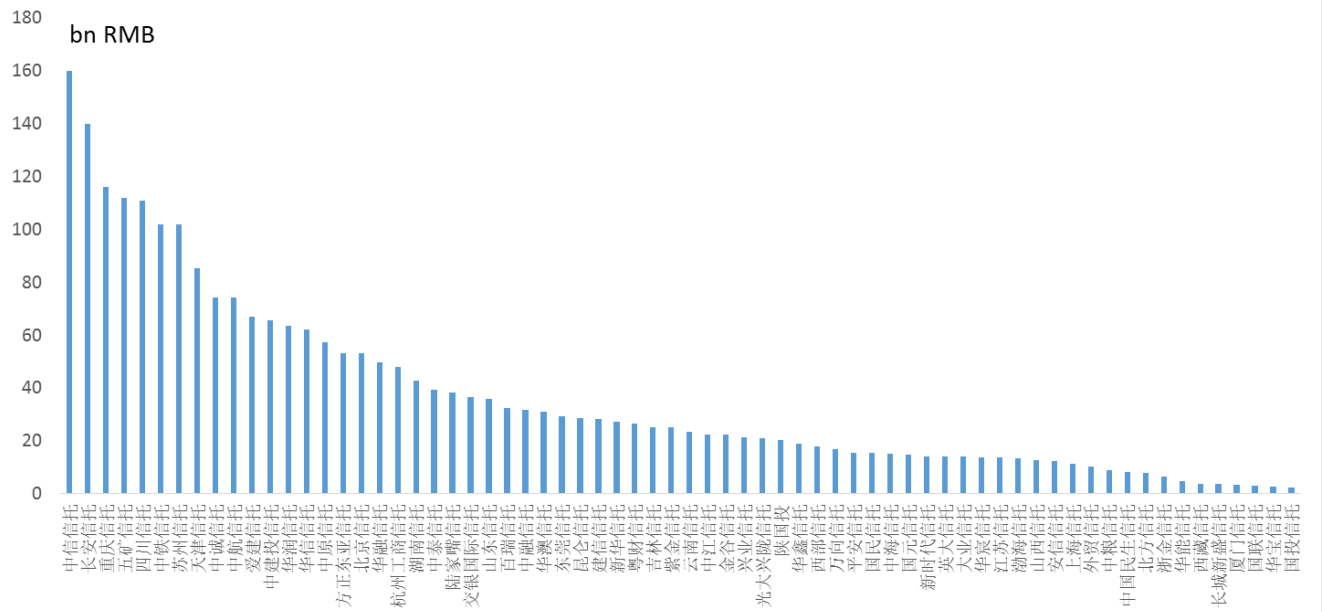
Source: iFind.

Figure 4-C: Distribution of total trust product issuance volume: by location of borrowers (2002-2015)

This figure plots the trust product issuance from 2002 to 2015 in our sample by location of borrowers.
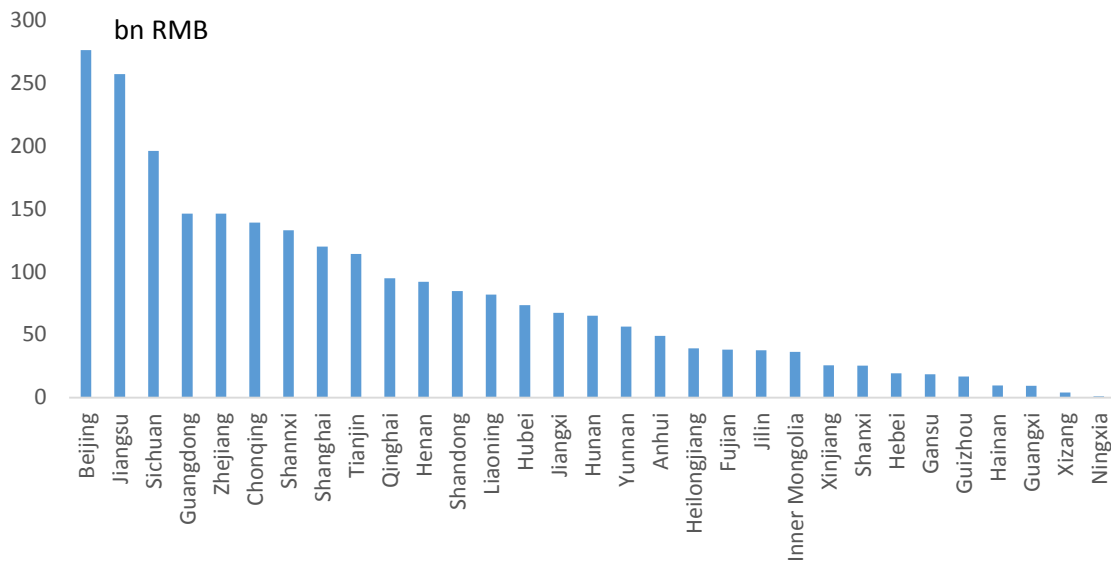
Source: iFind.

Figure 5: Industry distribution by different types of trust companies

This figure plots the industry distribution of different types (by government ownership) of trust companies.
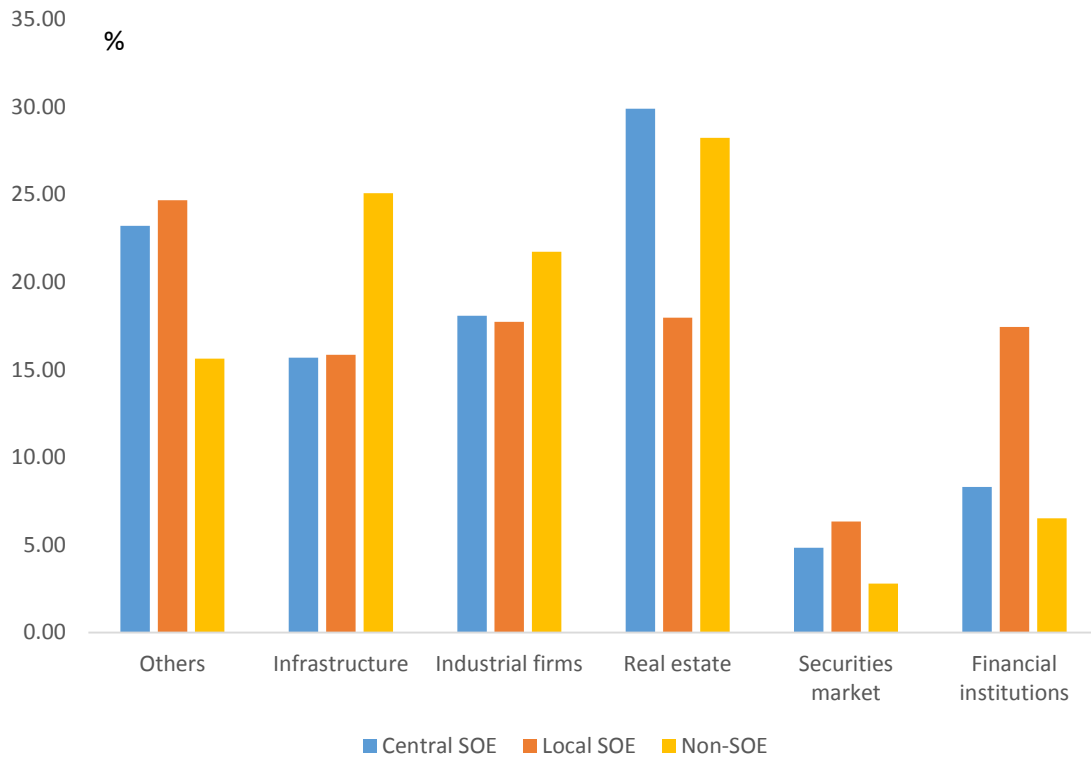
Source: iFind.

Figure 6-A: Province distribution of trust products: by product number

This figure plots the geographic distribution of borrowing through trust products by product number.
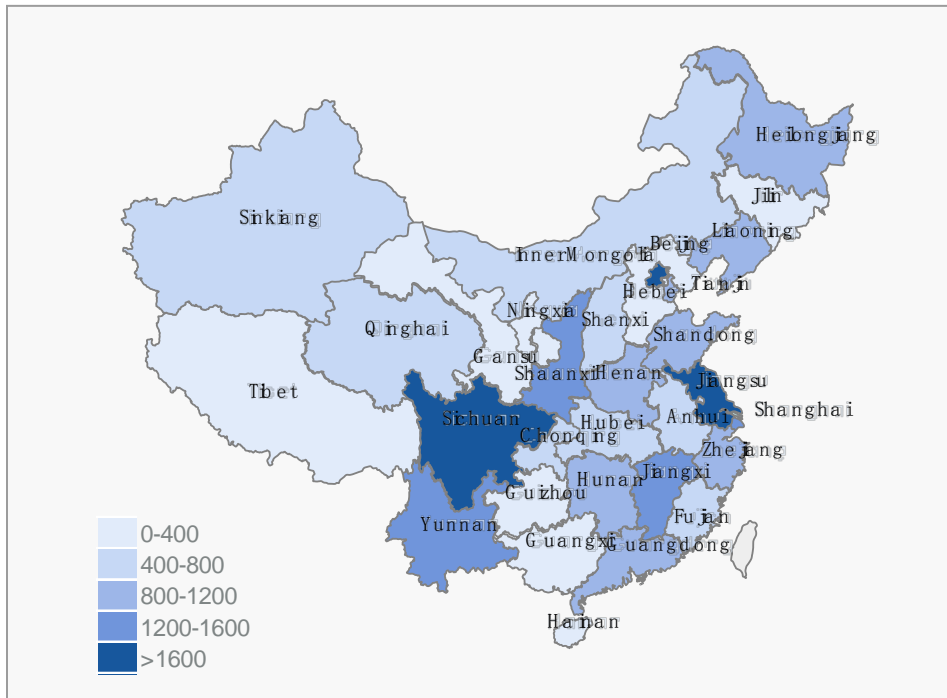
Figure 6-B: Province distribution of trust products: by issuance volume

This figure plots the geographic distribution of borrowing through trust products by product issuance volume.
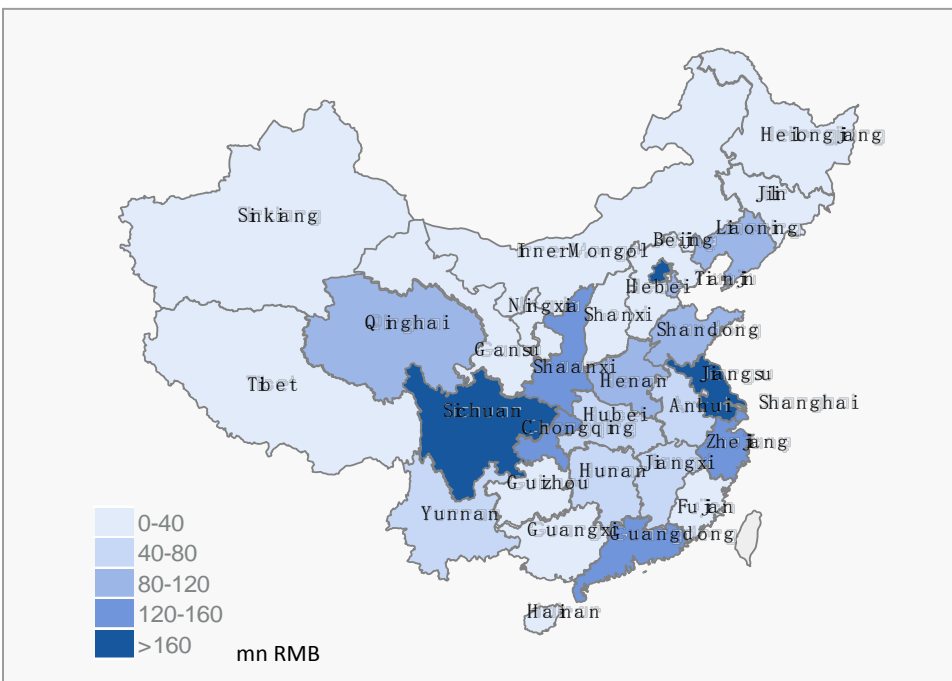
Table 1: Summary statistics

This table shows the summary statistics of the product characteristics, the trust firm characteristics as well as the trust firm name list. The product-level sample includes all the products that have expected yield information and have been issued from 2002 to 2015. The firm-level sample incudes the firm-year observations of 68 trust companies from 2002 to 2015. Panel A presents the summary statistics of the trust product characteristics. Panel B presents the mean value and standard deviation (in parentheses) of the main product variables by groups of companies based on the government ownership. Panel C presents the summary statistics of the trust firm characteristics.

Panel A: Trust product characteristics: Full sample

Variable	Obs	Mean	STD	Min	Median	Max
Expected yield (%)	25,397	8.99	2.07	0.08	9.30	44.26
Yield spread (%)	25,397	6.00	2.05	-3.63	6.20	41.51
Maturity (month)	24,801	20.52	14.94	0.20	21.00	300.00
Issuance vol. (mn)	19,509	128.46	229.54	0.50	67.17	13,000.00
Structure	25,154	0.20	0.40	0.00	0.00	1.00
Open	25,397	0.02	0.15	0.00	0.00	1.00
Collateral	25,397	0.27	0.45	0.00	0.00	1.00
Sale_bank_big5	25,397	0.10	0.29	0.00	0.00	1.00
Sale_bank_nonbig5	25,397	0.32	0.47	0.00	0.00	1.00
Borrower_regcap	10,609	1,070.22	2,963.08	0.03	258.00	68,821.10

Panel B: Trust product characteristics: by company groups

	Central SOE		Local SOE		Non-SOE	
	Obs.	Mean(std)	Obs.	Mean(std)	Obs.	Mean(std)
Expected yield (%)	5,882	8.78 (2.09)	10,738	8.65 (1.99)	6,570	9.89 (1.44)
Yield spread (%)	5,882	5.76 (2.15)	10,738	5.69 (1.97)	6,570	6.82 (1.45)
Maturity (month)	5,596	20.23 (20.24)	10,493	20.03 (14.79)	6,516	21.00 (10.00)
Issuance vol. (mn)	4,043	196.90 (296.73)	8,829	119.07 (235.35)	4,617	95.93 (153.86)
Structure product	5,818	0.31 (0.46)	10,628	0.18 (0.39)	6,511	0.16 (0.37)
Open product	5,882	0.05 (0.22)	10,738	0.02 (0.15)	6,570	0.01 (0.08)
Collateral	5,882	0.27 (0.44)	10,738	0.20 (0.40)	6,570	0.38 (0.48)
Sale_bank_big5	5,882	0.12 (0.32)	10,738	0.11 (0.31)	6,570	0.08 (0.27)
Sale_bank_nonbig5	5,882	0.40 (0.49)	10,738	0.21 (0.41)	6,570	0.47 (0.49)
Borrower_regcap(mn)	2,222	1,371.37 (3,509.84)	3,697	1,089.48 (3,500.22)	3,674	927.24 (2085.43)

Panel C: Trust company characteristics

Variable	Obs.	Mean	STD	Min	Median	Max
Reg_cap (mn RMB)	712	2,983	2,465	300	2,300	12,800
Firm_age (years)	712	15.96	9.69	0.00	17.00	36.00
Trust_asset (mn RMB)	381	147,427	161,499	2,603	98,192	1,096,840
Equity (mn RMB)	648	3,128.17	4,241.24	93.19	1897.52	56,017.83
Single trust asset/trust asset (%)	372	63.66	19.16	6.08	65.79	100.00
Collective trust asset/trust asset (%)	372	30.69	18.31	0.00	27.65	93.92
Property trust asset/trust asset (%)	372	5.62	7.72	0.00	2.57	51.14
Netcap/riskcap(%)	199	215.58	114.80	39.29	190.92	996.81

Table 2: Sale channels of trust products

This table reports the distribution of the sale channels of the products in our sample by government ownership. "Sold by big 5" identifies the products that have been sold by the Big-5 (Bank of China, Industrial & Commercial Bank of China, Bank of Agriculture, China Construction Bank and Bank of Communications China). "Sold by non-Big 5" identifies the products that have been sold by non-Big 5 commercial banks in China. "Sold by nonbank" identifies the products that have been sold through other channels excluding commercial banks.

	Sold by Big-5	Sold by Non-Big-5	Sold by nonbank
Central SOE	11.16%	37.05%	51.79%
Local SOE	9.75%	33.20%	57.05%
Non-SOE	7.48%	41.07%	51.45%

Table 3: Industry distribution of total issuance: 2002-2015

This table reports the industry distribution of total trust issuance in our sample from 2002 to 2015.

Industries	Total issuance volume (bn RMB)	Percentage (%)
Real estate	607.24	24.33
Commercial & Industrial firms	472.83	18.95
Infrastructure	454.60	18.22
Financial institutions	292.19	11.71
Securities market	123.56	4.95
Others	545.16	21.84
TOTAL	**2495.61**	**100**

Table 4: How provincial characteristics affect the issuance of trust products?

This table reports the results of regression explaining what has driven the fast growth of trust product issuance. We use province-year sample for the regressions. The dependent variable is the logarithm of total issuance by province. All other variables are defined in the Appendix. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dep. Var.	Log of total issuance volume by province									
	Full sample						Real estate industry		Real estate (and other) industry	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GDP_growth	0.0252	0.0225	0.00949	0.0118	0.00538	0.00776	-0.0741*	-0.0720*	-0.00515	-0.00248
	(0.0218)	(0.0220)	(0.0251)	(0.0249)	(0.0244)	(0.0245)	(0.0393)	(0.0391)	(0.0256)	(0.0260)
Log_reinv		0.210	0.680*		0.744**		0.691		1.139**	
		(0.255)	(0.361)		(0.328)		(0.697)		(0.464)	
Log_reloan			-0.181		-0.259		-0.419*		0.0662	
			(0.165)		(0.167)		(0.218)		(0.140)	
Reinv/reloan				0.142*		0.166**		0.168*		0.0766**
				(0.0758)		(0.0822)		(0.087)		(0.0212)
Log_hp					2.604***	2.562***	5.151***	5.150***	2.358**	2.781***
					(0.844)	(0.861)	(1.281)	(1.266)	(0.958)	(0.982)
_cons	5.070***	2.871	-0.626	4.659***	-21.17***	-15.70**	-39.25***	-36.26***	-28.22***	-18.35**
	(0.601)	(2.763)	(4.240)	(0.617)	(7.753)	(6.760)	(12.28)	(9.782)	(9.264)	(7.915)
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Province FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	298	298	225	225	225	225	182	182	177	177
Adj. R-sq.	0.785	0.785	0.811	0.810	0.820	0.819	0.599	0.600	0.790	0.781

Table 5: Determinants of ex-ante yield spread: The role of implicit guarantee

This table reports the results of regressions examining the determinants of yield spread (the difference between expected yield at issue and the matched 1-year treasury bond interest rate). The dependent variable is the product yield spread. All other variables are defined in the Appendix. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dep. Var.	Product expected yield spread (%)			
	(1)	(2)	(3)	(4)
Product characteristics				
Maturity	0.0255***	0.0497***	0.0222***	0.0490***
	(0.00291)	(0.00377)	(0.00286)	(0.00382)
Structure	0.385***	0.504***	0.384***	0.277***
	(0.0358)	(0.0511)	(0.0392)	(0.0514)
Open	-0.416***	-0.132	-0.618***	-0.371
	(0.0840)	(0.309)	(0.0826)	(0.315)
Log_inv_threshold	0.612***	0.702***	0.482***	0.529***
	(0.0536)	(0.0923)	(0.0566)	(0.0876)
Collateral	0.295***	0.222***	0.400***	0.221***
	(0.0235)	(0.0303)	(0.0266)	(0.0304)
Sale_bank_big5	-0.205***	-0.137***	-0.375***	-0.114**
	(0.0400)	(0.0440)	(0.0480)	(0.0570)
Sale_bank_nonbig5	-0.00330	-0.0865***	-0.252***	-0.0543
	(0.0257)	(0.0294)	(0.0427)	(0.0512)
Trust company characteristics				
Central SOE	-0.875***	-0.671***	-	-
	(0.0322)	(0.0378)	-	-
Local SOE	-0.594***	-0.483***	-	-
	(0.0299)	(0.0316)	-	-
Log_reg_cap	-0.159***	-0.224***	-	-
	(0.0184)	(0.0205)	-	-
Borrower characteristics				
GDPgrowth	-0.0192***	-0.00614	-0.00282	0.00849
	(0.00357)	(0.00417)	(0.00346)	(0.0629)
Log_borrowersize		-0.0249***		-0.0179**
		(0.00902)		(0.00886)
i.real estate	0.415***	0.389***	0.311***	0.271***
	(0.0332)	(0.0376)	(0.0326)	(0.0359)
i.infrastructure	-0.0934***	-0.0394	-0.0961***	-0.130***
	(0.0296)	(0.0334)	(0.0290)	(0.0332)
i.securities market	-1.834***	-1.114*	-1.611***	-0.323
	(0.0658)	(0.579)	(0.0950)	(0.751)
i.fin institutions	-0.732***	-0.807***	-0.557***	-0.432***
	(0.0502)	(0.0748)	(0.0531)	(0.0754)
i.others	-0.554***	-0.249***	-0.432***	-0.240***
	(0.0409)	(0.0619)	(0.0423)	(0.0645)
_cons	1.632***	1.652***	-0.101	3.587**
	(0.367)	(0.504)	(2.354)	(1.823)
Year FE	YES	YES	YES	YES
Trust firm FE	NO	NO	YES	YES
N	16406	8436	16406	8436
adj. R-sq	0.390	0.383	0.464	0.466

Table 6: Stock market crash and ex-ante yield spread

This table reports the results of regressions examining the impact of stock market crash on product ex-ante pricing. The dependent variable is the product yield spread. *Stk_crash* is defined as 1 if the product was issued by July 15, 2015 to the end of 2015, and 0 if the product was issued between May 1, 2014 to April 30, 2015. Our sample includes the products issued by ten treated firms and ten control firms. *Treated* is equal to 1 if the trust firm is one of the ten firms that issue most products investing in securities market in the 12months prior to the crash. We find a matched firm for each treated firm by using one-to-one propensity score matching based on the average yield spreads and total issuance volume before the crash as well as the ownership dummy (Central, Local SOE or non-SOEs). All other variables are defined in the Appendix. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dep. Var.	*Product expected yield spread (%)*			
	(1)	(2)	(3)	(4)
Stk_crash	0.581***	0.487*	0.555***	-0.128
	(0.0413)	(0.284)	(0.0543)	(0.251)
Treated		1.180***		-
		(0.135)		-
Treated*stk_crash		0.542*		1.389***
		(0.293)		(0.285)
Structure	0.302***	0.547***	0.444***	0.457***
	(0.0679)	(0.0922)	(0.0698)	(0.0888)
Open	-0.730***	-0.697***	-0.118	-0.0209
	(0.122)	(0.131)	(0.0888)	(0.121)
Log_inv_threshold	0.686***	0.286	0.382***	0.203
	(0.127)	(0.201)	(0.132)	(0.190)
Collateral	0.369***	0.351***	0.239***	0.273***
	(0.0335)	(0.0803)	(0.0419)	(0.0881)
Sale_bank_big5	0.165***	0.135	-0.709***	-1.116***
	(0.0581)	(0.107)	(0.138)	(0.143)
Sale_bank_nonbig5	0.288***	0.396***	-0.655***	-0.876***
	(0.0380)	(0.0939)	(0.144)	(0.148)
Log_reg_cap	-0.158***	-0.228	-	-
	(0.0236)	(0.159)	-	-
GDPgrowth	-0.0168*	-0.0776***	-0.00812	-0.0621***
	(0.0101)	(0.0195)	(0.00672)	(0.0182)
i.real estate	0.296***	0.131	0.194***	-0.0665
	(0.0440)	(0.0950)	(0.0479)	(0.107)
i.infrastructure	0.0969**	0.0679	0.0245	0.115
	(0.0379)	(0.0937)	(0.0387)	(0.0928)
i.securities market	-2.248***	-2.487***	-2.240***	-2.562***
	(0.185)	(0.156)	(0.208)	(0.143)
i.financial	-0.680***	-0.474***	-0.522***	-0.465***
	(0.0781)	(0.128)	(0.0982)	(0.141)
i.others	-0.883***	-0.913***	-0.390***	-0.753***
	(0.0731)	(0.169)	(0.0708)	(0.174)
_cons	5.198***	1.445	7.065***	35.17***
	(0.649)	(2.187)	(1.407)	(3.799)
Firm FE	NO	NO	YES	YES
Obs.	4890	1909	4890	1909
Adj. R-sq.	0.310	0.492	0.457	0.568

Table 7: Risk sensitivity of product pricing: the role of implicit guarantee

This table reports the results of regressions examining the effect of expectation of implicit guarantees on risk sensitivity of product pricing. The dependent variable is the product expected yield spread. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively. In Panel A, a, b and c represent for the statistical significance for the *Chi-sq* of the tests on coefficients between the sample of products issued by Central SOEs and by Local SOEs or by Non-SOEs at the 1%, 5% and 10% level; In Panel B, , a, b and c represent for the statistical significance for the *Chi-sq* of the tests on coefficients between the sample of products sold by Big-5 banks and through other channels, at the 1%, 5% and 10% level; In Panel C, a, b and c represent for the statistical significance for the *Chi-sq* of the tests on coefficients between the sample of products issued by large trust companies or small trust companies, at the 1%, 5% and 10% level. The subsample of products issued by large or small trust firms are defined by the 33% quantile of logarithm of trust companies' registered capital. All other variables are defined in the Appendix.

Panel A: Central vs. Local vs. Non-SOE

Dep. var.	Product expected yield spread (%)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Central SOE	Local SOE	Non-SOE	Central SOE	Local SOE	Non-SOE
Sale_bank_big5	-0.567***	-0.145**[a]	0.0586[a]	-0.293***	-0.158**	0.189***[a]
	(0.0897)	(0.0599)	(0.0579)	(0.0974)	(0.0733)	(0.0589)
Sale_bank_nonbig5	-0.207***	-0.00798[a]	0.262***[a]	-0.183***	-0.202***	0.167***[a]
	(0.0577)	(0.0457)	(0.0346)	(0.0679)	(0.0557)	(0.0383)
Log_reg_cap	-0.0665	-0.325***[a]	-0.185***	-0.140*	-0.250***	-0.171***
	(0.0733)	(0.0324)	(0.0214)	(0.0846)	(0.0359)	(0.0260)
GDPgrowth	0.0148*	-0.0332***[a]	-0.00300[b]	0.00352	-0.0149*[c]	-0.00112
	(0.00767)	(0.00546)	(0.00493)	(0.00729)	(0.00768)	(0.00616)
Log_borrowersize				-0.0320	0.00954[c]	-0.0475***
				(0.0288)	(0.0149)	(0.0132)
i.real estate	0.130*	0.670***[a]	0.403***[a]	0.0767	0.604***[a]	0.378***[a]
	(0.0692)	(0.0566)	(0.0453)	(0.0798)	(0.0634)	(0.0492)
cons.	YES	YES	YES	YES	YES	YES
year FE	YES	YES	YES	YES	YES	YES
Other controls	YES	YES	YES	YES	YES	YES
N	4011	7215	5180	1882	3181	3373
adj. R-sq	0.397	0.430	0.278	0.450	0.411	0.324

Panel B: Big 5 banks as sale channels vs. Others

Dep. Var.	Product expected yield spread (%)			
	(1)	(2)	(3)	(4)
	Big 5	Others	Big 5	Others
Central SOE	-0.946***	-0.866***	-0.955***	-0.638*** [a]
	(0.107)	(0.0338)	(0.111)	(0.0405)
Local SOE	-0.495***	-0.600***	-0.574***	-0.450***
	(0.0812)	(0.0297)	(0.0950)	(0.0322)
Log_reg_cap	-0.0779	-0.166***	0.0212	-0.229*** [a]
	(0.0669)	(0.0191)	(0.0790)	(0.0210)
GDPgrowth	0.00115	-0.0192***[c]	0.0114	-0.00689
	(0.0107)	(0.00380)	(0.0117)	(0.00449)
Log_borrowersize			-0.00311	-0.0260***
			(0.0250)	(0.00963)
i.real estate	0.287***	0.412***	0.0850	0.422*** [a]
	(0.0997)	(0.0354)	(0.103)	(0.0404)
Cons.	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Other controls	YES	YES	YES	YES
N	1743	14663	963	7473
adj. R-sq	0.386	0.405	0.462	0.380

Panel C: Large vs Small issuing trust companies

Dep. Var.	Product expected yield spread (%)			
	(1)	(2)	(3)	(4)
	Large firm	Small firm	Large firm	Small firm
Central SOE	-0.635***	-1.218***[b]	-0.348***	-1.747** [b]
	(0.0873)	(0.271)	(0.109)	(0.725)
Local SOE	-0.524***	-0.163*** [a]	-0.300***	-0.153*** [b]
	(0.0524)	(0.0449)	(0.0575)	(0.0501)
Sale_bank_big5	-0.346***	0.292*** [a]	-0.113	0.300*** [a]
	(0.0750)	(0.0883)	(0.114)	(0.0833)
Sale_bank_nonbig5	-0.368***	0.0643 [a]	-0.512***	0.0948** [a]
	(0.0592)	(0.0405)	(0.0809)	(0.0413)
GDPgrowth	-0.00523	-0.00343	-0.0146*	0.00286
	(0.00615)	(0.00582)	(0.00760)	(0.00749)
Log_borrowersize			-0.0299	-0.0198*
			(0.0236)	(0.0103)
i.real estate	0.256***	0.568*** [a]	0.236***	0.512*** [a]
	(0.0664)	(0.0584)	(0.0791)	(0.0568)
Cons.	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Other controls	YES	YES	YES	YES
N	5546	4927	2720	2780
adj. R-sq	0.311	0.561	0.365	0.399

Table 8: Real estate product subsample: the role of implicit guarantee on housing market risk

This table reports the results of regressions examining the effect of expectation of implicit guarantees on sensitivity of product pricing to housing market risk based on the subsample of real estate products. The dependent variable is the product yield spread. The *Hmarket_risk* is defined as the residual of the regression of housing price (adjusted by disposable income per capita) on GDP growth by province. All other variables are defined in the Appendix. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dep. var.	Product expected yield spread (%)	
	(1)	(2)
Hmarket_risk	-0.0130	0.0844*
	(0.0224)	(0.0451)
Central SOE*Hmarket_risk		-0.125**
		(0.0540)
Local SOE*Hmarket_risk		-0.122*
		(0.0687)
Maturity	0.0457***	0.0456***
	(0.00800)	(0.00798)
Structure	0.487***	0.478***
	(0.0867)	(0.0879)
Open	1.113***	1.198***
	(0.253)	(0.247)
Log_inv_threshold	0.877***	0.886***
	(0.226)	(0.228)
Collateral	0.317***	0.312***
	(0.0794)	(0.0797)
Sale_bank_big5	-0.232***	-0.240***
	(0.0829)	(0.0832)
Sale_bank_nonbig5	-0.0482	-0.0457
	(0.0644)	(0.0644)
Central SOE	-0.887***	-0.892***
	(0.0827)	(0.0826)
Local SOE	-0.490***	-0.496***
	(0.0750)	(0.0755)
Log_reg_cap	-0.269***	-0.268***
	(0.0485)	(0.0480)
Log_borrowersize	-0.0695***	-0.0684***
	(0.0256)	(0.0256)
GDPgrowth	-0.00268	-0.00375
	(0.00816)	(0.00848)
_cons	1.126	0.976
	(1.048)	(1.059)
year FE	YES	YES
N	2051	2051
adj. R-sq	0.357	0.359

Table 9: The impact of the default cases on implicit guarantee

This table reports the results of regression examining the impact of first default case in trust industry in January 2014 on the pricing of implicit guarantee. The dependent variable is the product yield spread. *Post_default* is defined as 1 if the issuance date of is later than February 1ˢᵗ, 2014 and 0 otherwise. In the matched sample in column (2), for each product issued during the post-default period, we use one-to-one propensity score matching based on product characteristics (maturity, issuance vol., structure, open and collateral) and size of trust firms to find a control product. All other variables are defined in the Appendix. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dep. Var	Product expected yield spread (%)	
	(1) Full sample	(2) Matched sample
Post_default	0.212***	0.156***
	(0.0464)	(0.0529)
Central SOE*Post_default	-0.637***	-0.759***
	(0.0803)	(0.102)
Local SOE*Post_default	-0.333***	-0.263***
	(0.0683)	(0.0744)
Sale_bank_big5	-0.157***	-0.146**
	(0.0478)	(0.0597)
Sale_bank_nonbig5	-0.0488	-0.0482
	(0.0320)	(0.0364)
Central SOE	-0.280***	-0.0360
	(0.0706)	(0.0880)
Local SOE	-0.225***	-0.150**
	(0.0622)	(0.0691)
Log_reg_cap	-0.252***	-0.220***
	(0.0220)	(0.0265)
GDPgrowth	0.00532	-0.00440
	(0.00358)	(0.00432)
Log_borrowersize	-0.0358***	-0.0292***
	(0.00965)	(0.0109)
i.real estate	0.355***	0.372***
	(0.0410)	(0.0489)
i.infrastructure	-0.0304	-0.0839**
	(0.0360)	(0.0428)
i.securities market	-1.422**	-2.374**
	(0.609)	(0.927)
i.fin institutions	-0.800***	-0.722***
	(0.0816)	(0.0877)
i.others	-0.219***	-0.219***
	(0.0655)	(0.0802)
_cons	0.942**	0.959
	(0.382)	(0.681)
Other controls	YES	YES
Year FE	NO	NO
N	8436	6028
adj. R-sq	0.266	0.227

Table 10: The impact of housing purchase restriction on implicit guarantee

This reports the results of regressions examining the impact of housing purchase restriction imposed by the Order 10 in April 2010 on the pricing of implicit guarantee in the real estate industry. We include the real estate product issued one year around the announcement of "Order 10". *RE_shock* is defined as 1 if the product was issued between May 2010 to April 2011, 0 if the product was issued between April 2009 to March 2010. The dependent variable is the product yield spread. All other variables are defined in the Appendix. Standard errors are in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dep. Var	*Product expected yield spread (%)*	
	(1)	(2)
RE_shock	0.472***	0.890**
	(0.162)	(0.373)
Central SOE * RE_shock		-1.024**
		(0.495)
Local SOE * RE_shock		-0.200
		(0.436)
Maturity	0.0340***	0.0337**
	(0.0128)	(0.0134)
Structure	0.845***	0.808***
	(0.226)	(0.228)
Log_inv_threshold	0.524***	0.550***
	(0.141)	(0.149)
Collateral	0.484***	0.485***
	(0.162)	(0.162)
Sale_bank_big5	-0.292	-0.274
	(0.202)	(0.200)
Sale_bank_nonbig5	0.0464	0.0363
	(0.187)	(0.187)
Central SOE	-1.087***	-0.490
	(0.268)	(0.367)
Local SOE	-1.025***	-0.949***
	(0.255)	(0.274)
Log_reg_cap	0.278	0.291
	(0.180)	(0.179)
GDPgrowth	-0.0171	-0.0120
	(0.0109)	(0.0108)
Cons.	4.005***	3.534***
	(0.877)	(0.921)
Year FE	NO	NO
Obs.	508	508
adj. R-sq	0.232	0.240

Table A.1 Variable Definitions

Variable	Definition
Expected yield	= expected yields marketed in the product prospectus
Yield spread	= the difference between the expected yield of the product and the matched 1-year treasury bond yield in the month of issuance
Maturity	= the maturity of the trust product in months
Issuance vol.	= the issuance volume of products
Structure	=1 if the product is structured; 0 otherwise.
Open	=1 if the product is open for redemption before the maturity date; 0 otherwise.
Collateral	=1 if the issue is based on collateral; 0 otherwise.
Log_inv_threshold	= logarithm of the minimum investment amount of the trust product.
Sale_bank_big5	=1 if the product is sold by a Big-5 bank; 0 otherwise.
Sale_bank_nonbig5	=1 if the product is sold by a non-Big-5 bank; 0 otherwise.
Reg_cap	= the amount of registered capital of trust companies.
Log_reg_cap	= logarithm of registered capital of trust companies
Trust_assets	= the total amount of trust assets of trust companies.
ROE	= the return on equity of trust companies
Netcap/riskcap	= the ratio of net capital to risk capital
Central SOE	=1 if the controlling shareholder of the trust company is a central SOE; 0 otherwise.
Local SOE	=1 if the controlling shareholder of the trust company is a local SOE; 0 otherwise.
GDP_growth	= the GDP growth rate of the borrower's headquartered province.
Borrower_regcap	=the registered capital of borrower
Log_borrowersize	=the natural logarithm of borrowers' registered capital
Post_default	=1 if after the first close-to-default case of trust product in China in the end of January 2014; 0 otherwise.
Stk_crash	=1 if after the stock market crash in the summer of 2015.
RE_shock	=1 if the product was issued between May 2010 to April 2011, and 0 if the product was issued between April 2009 to March 2010.
Hmarket_risk	=the residual of the regression of housing price (adjusted by disposable income per capita) on GDP growth by province.
Log_reinv	= logarithm of the real estate investment amount in the borrower's headquartered province.
Log_reloan	= logarithm of the real estate loan in the borrower's headquartered province.
Reinv/reloan	= the ratio of real estate investment to real estate loan in the borrower's headquartered province.
Log_hp	= the logarithm of the housing price in the borrower's headquartered province.