

# Shadow Banking Activities in Non-Financial Firms: Evidence from China

Julan Du<sup>1</sup>

Chang Li<sup>2</sup>

Yongqin Wang<sup>3</sup>

## Abstract

This study examines re-lending in corporate China, a particular form of shadow banking activities in emerging markets performed by non-financial firms, in which firms borrow in order to lend. We identify its existence by using three types of strategies to track the abnormal relations between financial accounts. By exploring factors influencing re-lending, we find that firms with better growth opportunities, stronger corporate governance, and more financial constraints engage less in re-lending. State-controlled companies are particularly active in re-lending probably because of their better access to financial markets, lower profitability in main business and lack of growth opportunities.

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<sup>1</sup> Department of Economics, Chinese University of Hong Kong, phone: (852) 39438008, email: julan.du@foxmail.com.

<sup>2</sup> Department of Economics, Chinese University of Hong Kong, phone: (852) 69987790, email: cecelia.lichang@gmail.com.

<sup>3</sup> School of Economics, Fudan University, phone: (86) 21-65643054, email: yongqinwang@fudan.edu.cn

## **1. Introduction**

Shadow banking consists of a diverse set of institutions and markets that, collectively, carry out traditional banking functions outside, or in ways only loosely linked to, the traditional system of regulated depository institutions (Bernanke, 2012). The 2007-2009 Global Financial Crisis originated in the shadow banking system in the US and essentially is a run on the shadow banks (Gorton and Metrick, 2012), and ever since there has been a large literature on the workings and consequences of the formerly less understood shadow banking system.

Nonetheless, the current literature is mainly focused on the shadow banking system in the United States. Research on emerging economies has been scarce. Given the regulatory weaknesses in the emerging economies and the potential threats these weaknesses pose to the world economy, it is imperative to study shadow banking in emerging markets. Since shadow banking in the advanced economies is dominated by the securitization markets, the current literature focuses on the financial sector and pays little attention to the shadow banking activities conducted by non-financial firms. In China, the largest emerging economy, shadow banking has been developing rapidly since the global financial crisis. The Chinese shadow banking sector has become the fifth largest among FSB jurisdictions in 2012 and stepped to the third in 2014, in US dollar terms.<sup>4</sup> Unlike the capital market-based system in the US, the shadow banking system in China is bank-centric and thus has greater interaction with the traditional banks (Dang et al., 2014). More importantly, in the Chinese system

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<sup>4</sup> IMF Global Stability Report.

non-financial firms with good access to formal finance act as *de facto* financial intermediaries, via re-lending, i.e., borrowing from banks or issuing bonds and lending out to credit-constrained firms. This kind of shadow banking activity is largely unregulated.

The re-lending business is a natural outcome of financial repression wherein large privileged enterprises have access to formal finance with favorable conditions but small enterprises have highly restricted access to formal finance. As financial repression is a prevalent phenomenon in emerging market economies, re-lending business can be an important shadow banking activity. Thus, a study of the Chinese experience of re-lending activities can be useful for us to understand the re-lending business in emerging economies.

Our empirical analysis is carried out along two lines: first, we try to identify the re-lending business, either from predictions of financing pattern or from the trace of fund flows based on the balance sheets; second, we analyze the potential factors affecting the extent of involvement in re-lending business for non-financial firms, including growth opportunities, credit constraints, and corporate governance.

As re-lending is an illegal and illegitimate activity for non-financial firms, we make great efforts to detect it by digging into the balance sheets of listed companies. Firstly, we examine the relationship between financial assets and financial liabilities. If firms operate normally, the relationship is expected to be negative, which is suggested by pecking order theory (Myers, 1984) and verified by the results from the sample of U.S. firms. Our results show that non-financial firms in China exhibit a

significantly positive relationship between financial assets and liabilities, implying participation in re-lending activities. But there is striking heterogeneity among different firms. State-controlled firms have substantial shadow banking activities, whereas private or foreign-controlled firms do not.

Secondly, from a dynamic perspective, we also examine the correlation between financial assets and business fixed investments. In normal operations, the relationship is expected to be negative. In our empirical results, the correlation between liquid financial assets and business fixed investments is positive, giving additional evidences for the existence of shadow banking activities. For a better understanding of the implication of this observed pattern, we conduct identical regressions using U.S. firms over the same sample period, and find that U.S. firms do not exhibit this abnormal pattern as do Chinese firms.

Thirdly, we also identify re-lending business by tracing the fund flows in the financial statements. Interest income from re-lending business is not recorded in “interest revenue” to evade legal punishments. Typically it is recorded in “other receivables”. We detect a positive relationship between other receivables and financial liabilities, which lends support to the existence of re-lending activities. The positive correlation is most prominent among central state-controlled companies i.e., state-owned firms administered by the central government.

Moreover, we observe that other receivables keeps a significantly positive correlation with non-operating income and a negative correlation with financial expenses even after controlling for the amount of debts. These results indicate that

interest income from re-lending business most likely flows into “non-operating income” or writes down “financial expenses”. This further supports the existence of shadow banking activities indirectly.

For better identification, we also exploit monetary policy shocks to carry out, in essence, a Difference-in-Differences (DID) analysis. The idea is that the rather exogenous shocks affect different firms’ financing patterns differentially. The inclusion of policy indicators does not change the sign and significance of the estimated coefficients of financial liabilities in previous analysis and thus reinforces our identification conclusions. Meanwhile tight monetary policies impede firms’ engagement in re-lending business and state-controlled firms are hit less severely than do non-state-controlled ones. We also find that firms have more freedom to engage in shadow banking activities when bank loan capacity strengthens. These all reveal that upstream available funds for lending firms from financial markets do affect the participation of non-financial firms in the shadow banking system. Furthermore, we employ the crisis episode (2008 Q4 to 2010 Q4) to explore the impact of the crisis and government stimulus plan. It is found that the 2008 financial crisis shrinks the re-lending business, and state-controlled firms are affected less than do private-controlled ones.

After identifying the shadow banking activities, we further study the potential factors affecting the extent of participation of non-financial firms: growth opportunity, corporate governance and external finance dependence. We find that better growth opportunity, stronger corporate governance and higher dependence on external

finance would deter firms from engaging in re-lending activities.

This study is inspired by Shin and Zhao (2013), who also examine the role of non-financial firms as surrogate intermediaries in emerging economies. However, they only focus on the correlation between financial assets and liabilities of all firms and observe the signs of coefficients. In contrast, our study attempts to detect the re-lending activities from various angles. This study also complements Acharya et al. (2015) and Allen et al. (2015) that examine wealth management products (WMP) and entrusted loans, respectively, in China. Unlike WMP and entrusted loans, the re-lending examined in this study is the most opaque part of shadow banking activities, and our study attempts to detect its existence and explore its determinants.

Our paper makes several contributions to the literature. First, it is one of the papers in the first wave to study shadow banking in emerging economies, and focuses on one form of shadow banking closely linked with real economy and beyond the financial industry. Second, it will shed some light on the transmission channels of monetary policies in the presence of the shadow banking system. Lastly, this paper gives some policy implications for regulating shadow banking activities. The identification of prevalent re-lending activities should alert regulators to the non-negligible risks generated by the re-lending business to financial system, although it helps credit-constrained firms to raise funds to a certain extent. If a fraction of firms cannot repay their loans, a chain reaction could be set into motion in the whole economy. We know that the root cause of re-lending business is the distorted financial system reflected in financial repression policies, etc. As long as these underlying

problems are not solved, more forms of shadow banking activities would emerge even if re-lending business of non-financial firms were curbed.

The remainder of paper is organized as follows. Section 2 briefly discusses the relations to the literature. Section 3 is the introduction of background information in Chinese shadow banking. Section 4 specifies the identification methodology and describes the data and summary statistics. Sections 5 and 6 present the empirical results for the existence of re-lending business and the factors influencing the business. Section 7 concludes.

## **2. Relations to the Literature**

Most of the existing literature has focused on the shadow banking system in the advanced economies. From the microeconomic perspective, the literature studies the micro mechanisms of the shadow banking system in financial intermediation and financial markets including asset-backed securities, Repos, money market mutual funds (MMMFs), securities lending and asset-backed securities (ABS)<sup>5</sup>. They examine the design and risk brought to the financial sector for each activity (e.g. Krishnamurthy, Arvind, Nagel, and Orlov, 2011; Arteta, Carey and Correa, 2012; Acharya, Schnabl, and Suarez, 2013; Kacperczyk, Marcin, and Schnabl, 2013), suggesting that securitization doesn't realize the traditionally designed function, risk transfer. The literature also explores the underlying causes of the financial crisis either empirically or theoretically, such as problems in credit ratings, agency problems in

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<sup>5</sup> The definition and inclusion vary in different agencies, and here we just list the common activities.

banks, government induced distortions and increased systematic risk but decreased idiosyncratic risk induced by securitization (Adelino and Manuel, 2009; Ashcraft, Adam, Goldsmith-Pinkham, and Vickery, 2010; Fahlenbrach, Rudiger, and Stulz, 2011; Gennaioli, Shleifer, and Vishny, 2013). Also regulation in shadow banking sector has received certain attention in studies. Gorton and Metrick (2010) propose to use bankruptcy harbor on repos and establish strict controls by chartering new forms of narrow banks for MMMFs; Ricks (2010) examines the efficiency of potential approaches for policy intervention, and finds that the insurance regime is most efficiency maximizing.

The paper is also closely related to the literature on related-party loans, which is prevalent across emerging economies. The related-party lending often occurs between firms under a common owner or management; or it is often an internal decision to allocate capital across subsidiaries of a business group, in order to overcome some market frictions (Khanna and Yafeh, 2005). A number of studies estimate the magnitude, economic consequences and determinants of related-party loans. Bertrand et al. (2002) find that Indian groups channel resources away from firms in which the controlling shareholders have relatively low cash flow rights to firms in which they have high cash flow rights. Buchuk et al. (2013) investigate “tunneling” using a dataset of intra-group lending in Chile. Gopalan et al. (2007) argue that the intra-group loans are typically lent at zero interest rates. Lin et al. (2013) find that related lending could avoid excessive reliance on outside lenders, especially banks.

Thus, related-party lending is usually an outcome of internal capital markets or



corporate tunneling, whereas the re-lending business reflects the transition of non-financial firms toward de facto financial intermediaries. One paper that should be mentioned is Jiang, Lee and Yue (2010). It takes “other receivables” as a measure of tunneling-related loans in China before 2006, which is also used in our paper to stand for a fraction of re-lending loans after 2006 when related party loans were cleaned up.

Although much of the literature focuses on shadow banking, either empirically or theoretically, studies on Chinese shadow banking, especially on shadow banking activities in non-financial firms, are very limited. Some papers only examine the activities of commercial banks, which play the most important role in shadow banking sector in China. They try to answer why shadow banking grows so rapidly these years or whether the shadow banking activities would bring systemic risks or impose pressures on the solvency of the banking sector. Hachem and Song (2016) explore the behavior of commercial banks, but isolate the regulatory triggers for shadow banking by documenting the differences between small and medium-sized banks and Big Four banks. They show that banks’ loan-to-deposit ratio and reserve requirements are the key factors triggering the involvement of small and medium-sized banks in shadow banking, but Big Four step into the market only in order to “defend the market share”. Li and Hsu (2013) mainly examine the financial risks produced by shadow banks and run a stress test for banks; they find that large financial institutions face certain solvency and credit risks, and suggest to push forward the progress on interest rate liberalization.

Moreover, some papers pay attention to several specific forms of shadow

banking activities in China. Acharya et al. (2015) examine the characteristics of the largest component of shadow banking, wealth management products (WMP), and explore the impacts of interest rate policies and bank regulation on the development of WMP, using WMP data of 25 largest commercial banks in China. Allen et al. (2015) focus on entrusted loans, a similar form with re-lending business; they find that firms with privileged access to financial markets tend to lend more to less privileged non-financial firms, and differentiate lenders and loan characteristics between non-affiliated and affiliated loans. By examining illegal and illegitimate re-lending, our analysis complements the above two studies so as to provide a more complete overview of shadow banking activities in corporate China.

### **3. An Overview of Shadow Banking in China**

Although the 2008 financial crisis somehow interrupted the securitization markets, a recent pickup in shadow banking activities in Euro area and the United Kingdom has already emerged (FSB, 2013c). Emerging economies such as Southeast Asian countries and Mexico are also involved in this wave, but the growth of shadow banking in China stands out.

As with the advanced economies, the drivers of shadow banking in emerging markets often include, among others, the search for yields, the creation of information-insensitive assets, and the escape from capital requirements (Gorton, 2012). The regulation of interest rates on deposits and credit quota in the Chinese banking system strongly motivates the growth of wealth management products and

off-balance sheet activities, which constitutes part of shadow banking in China; nonbank financial firms in India complement the formal credit allocation in rural areas (Acharya et al., 2013). However, as mentioned earlier, the forms and components of shadow banking system are very different from those in the advanced economies where most of shadow banking activities involve various categories of nonbank financial entities, such as investment banks, dealers, hedge funds, etc., and are driven by the securitization markets. In emerging economies, the chains between lenders and borrowers are much shorter and simpler, and non-financial firms typically serve as financial intermediaries or middlemen between banks and credit-constrained firms. In this sense, the shadow banking system is bank-centric and works in the shadow of banks.

The Chinese shadow banking system has been expanding explosively since 2006. According to FSB calculation, its size takes the fifth place in the world in 2012 and the third in 2014. By the end of March in 2014, social financing<sup>6</sup> from shadow banking accounts for 35% of GDP, and its growth rate is nearly twice that of bank credit. In a financially repressed system, there is a tension between the shortage of financial instruments and the increasing demand of households for investment and risk sharing when China is getting richer. To gain higher yields than those on time deposits in banks, Chinese households are willing to devote funds to the shadow banking sector; the weighted average return of WMP is at least 1% higher than the returns on bank deposits and government bills since 2010. Meanwhile, small and

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<sup>6</sup> Social financing from shadow banking equals to total social financing computed by People's Bank of China deducting bank loans, equity-like items and bond issues.

medium-sized enterprises (SMEs) have difficulties in obtaining bank loans.<sup>7</sup> Also, financial intermediaries actively participate in financial innovations to alleviate the problems of credit quotas (e.g. the ratio of loans to deposits cannot be above 75%) and the requirements for capital adequacy ratio.

China's shadow banking activities include, in descending order of volume, banks' wealth management products, trust business, agency of assets management, private financing and local government and enterprises financing<sup>8</sup>. The re-lending activities among non-financial firms we study just belong to the category of private lending. It is reasonable to believe that the size of private lending is underestimated because of the illegal and illegitimate nature of private lending.

Financial frictions and imperfections in emerging economies are well documented in the literature. China is no exception (Allen et al., 2005). In contrast to SOEs, SMEs and private enterprises (PEs) are more likely to suffer from discrimination in credit markets and credit constraints due to their limited collateral and lack of political support, and thus have to resort to informal finance or self-finance. SOEs could finance more than 30 percent of investment by bank loans while PEs only have less than 10 percent (Song et al., 2011). This resource misallocation may impede economic development and lower the aggregate total factor productivity.

To alleviate financial constraints, Chinese firms develop many financing channels either in the banking sector or in the shadow banking sector<sup>9</sup>. The first one is

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<sup>7</sup> Financing demands are strongly concentrated on business entities (most are small and medium enterprises), infrastructure industry, and real-estate industry. (Shen, 2013)

<sup>8</sup> Report in People's Bank of China, 2012.

<sup>9</sup> We don't plan to list the elements of shadow banking sector in China exhaustively, but introduce some certain measures for non-financial firms to obtain more funds.

trust business, especially trust loans. Trust industry has flourished since the 1990s and expanded explosively after 2009. At the end of 2012, the proportions of trust funds devoted to infrastructure industry, real-estate industry and business entities are 23.6%, 9.9% and 26.6%<sup>10</sup>, respectively. Real-estate enterprises began to use trust loans as important financing channels after the global financial crisis, and the number of trust loan plans for real-estate industry has risen to more than 40 units in 2012, amounting to 488 billion Yuan. Still the trust channel is limited for the financing of credit-constrained firms in recent years since trust companies rarely provide funds to young firms or private firms without high-quality collaterals.

The second channel is Wealth Management Products (WMP) in credit categories, which are like ABS in the US, backed by various pooled loans and sold to individual investors. These financial contracts developed very fast, the number of which grew from 89 to 3345 units over the period 2006-2009. Both trust products and WMPs are not helpful for the credit-constrained firms, since most of the credits are used for the mortgages and infrastructure construction by local governments. Besides, regulatory authorities began to notice the unitary credit WMP, and China Banking Regulatory Commission (CBRC) closed the channel to issue loans through corporations between banks and trust companies in December 2010.

The third channel, which is also the one most closely related to our research, is entrusted loans. This is one way of lending between two firms, permitted by laws. According to *Notice of People's Bank of China on Issues Concerning Entrusted Loans*

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<sup>10</sup> The data resources are from Wind database and Trust industry association.

by *Commercial Banks* (2000), individuals or enterprises are permitted to provide funds to entrust commercial banks to issue loans using these funds. In the process, fund providers could appoint the fund receivers. Normally, a large firm with better access to bank loans can re-lend these funds to a credit-constrained firm by entrusting the funds to commercial banks to grant the loans. Here re-lending can also happen when the lending non-financial firms borrow from banks and then lend to other non-financial firms, if they do not use their own funds to lend. Although some local government authorities have restricted this business worrying about the underlying risk since 2010, entrusted loans have still developed explosively in recent years. The scale of entrusted loans increased by 2.55 trillion Yuan in 2013, making up 28.6% of the increase in total social financing, and the total amount has risen 65% from 2011 to 2013, reaching 8.2 trillion Yuan. In 2013, the number of announcements from listed companies concerning entrusted loans amounted to 397<sup>11</sup>.

This channel partly solves the problem of indirect financing for SMEs and PEs, but it has many limitations. Firstly, a large proportion of entrusted loans flow to real estate sector and local government financing platforms, rather than normal private or small firms with good investment opportunities. Secondly, regulation authorities began to worry about the risks brought by entrusted loans in 2014 and required commercial banks to disclose the information on entrusted loans to People's Bank of China (PBC) Consequently, this channel will face stricter regulation in the following years.

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<sup>11</sup> Data is quoted from PBC *China Financial Stability Report 2014*.

Although the above financing channels alleviate the financial constraints to an extent, private lending remains as one considerable source of funds for SMEs and PEs, and one prominent form of private lending is the direct lending among firms or individuals without the involvement of banks. This is one of the most opaque parts of shadow banking sector in China. The scale of private lending was estimated to be about 3.38 trillion Yuan, and this figure might jump to 4.5-5.5 trillion at the end of 2014<sup>12</sup>. For Wenzhou (one city in southeast China) only, the scale of private lending reached 110 billion Yuan in 2011.

Even many reputed SOEs have established subsidiaries to carry out shadow banking. For instance, a survey shows that 64 non-financial listed companies make loans to other companies in the first three quarters in 2011, and the amount is about 16.9 billion dollars, an increase of 38.2 percent over the same period of 2010.<sup>13</sup> Over a half of these firms lend at the interest rates higher than basic bank interest rates, reaching 24.5% annually at the highest level. Definitely this business generates considerable income for non-financial firms. For example, about one quarter of the profits of Yangzijiang Shipbuilding Holdings came from lending business in 2011. This direct re-lending business and entrusted loans constitute a substantial part of China's shadow banking system.

To study the behavior of re-lending in corporate shadow banking, we have some caveats. Firstly, direct lending activities between two non-financial firms are forbidden by laws. According to documents issued by the Supreme People's Court in

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<sup>12</sup> This figure is predicted by ANZ research reports.

<sup>13</sup> The data is quoted from <Economic Daily>.

1990 and the *General Provisions for Lending of People's Bank of China* enacted in 1996, lenders must be approved by PBC to engage in lending business and must register with the State Administration for Industry and Commerce. If debt disputes occur, the court could declare the lending contracts to be invalid. In reality, however, the inter-firm financial intermediation was popular and widespread. The Chinese government understood that re-lending could benefit both borrowing and lending firms, but at the same time was also concerned about the potential risks of debt default disputes. In response, the governments and judicial system were forced to make some concessions by providing a certain degree of *de facto* recognition of re-lending activities.<sup>14</sup> Overall, lending activities conducted by non-financial firms are illegal till now.

Because of the illegality and illegitimacy of re-lending, firms do not record re-lending activities transparently and put into clear accounting subjects in financial reports directly. Thus, the relevant data are limited. Nonetheless, our interview with industry experts suggests that re-lending activities were often recorded into the account of “other receivables”. At the same time, we can also trace re-lending activities from other abnormal patterns in financial statements. Hence, our research could only shed some light on the re-lending behavior using some indirect evidence. As stated above, the re-lending business is different from related-party lending. It is not limited to internal capital markets or tunneling activities; it provides another

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<sup>14</sup> *Notice of the Supreme People's Court on Issuing the Several Opinions on Providing Judicial Guarantee and Services for Accelerating the Transformation of the Economic Development Mode* in 2010 and *Notice of the Supreme People's Court on Legally and Properly Hearing Cases on Disputes over Private Lending to Promote Economic Development and Maintain Social Stability* in 2011 both show tolerance of inter-firm lending activities.



channel for companies possessing idle cash holdings to make more profits and also help high-productivity but credit-constrained companies to obtain necessary capital. It is a complement to the formal financial system.

As substantiated in Jiang et al. (2010), tunneling-motivated related-party lending activities were typically recorded in the account of “other receivables”. Fortunately, Chinese companies were forced to clean up a substantial amount of related-party loans i.e. loans to controlling shareholders in 2005 by China Securities Regulatory Commission (CSRC) and 2006 by eight government authorities; if this type of loan was not solved before 31 Dec, 2006, corporate top management would be arrested if necessary. Thus, much of our analysis focuses on the post-2006 period when the account of “other receivables” most likely captures the growing re-lending business.

It is noteworthy that in advanced economies nonbank lending actually has also grown rapidly since banks face many regulatory constraints and cannot grant loans flexibly, especially in long-term fund provision. Direct corporate lending develops extensively in the U.S. and Europe, where many nonbank entities, such as private equities and pension funds, become new lenders. IMF (2014) points out that the share of nonbank loans in leveraged lending rose from 20% in 2000 to 80% in 2013. Besides, peer-to-peer lending online platform started to take effect, although the scale is small. Thus, our study of private lending in China can help shed some light on this prevalent phenomenon.

## 4. Methodology and Data

### 4.1 Identification strategies

The fact that direct re-lending business of non-financial firms is forbidden in laws hampers the identification process, but we could still draw some indirect evidence based on financial theories.

**Strategy 1** In the spirit of Shin and Zhao (2013), we examine the relationship between liquid financial assets and financial liabilities so as to detect whether the increase in debts is devoted to real investments or to re-lending business. According to the influential “pecking order” theory (Myers, 1984), firms prefer to employ internal funds first and only tap the external funds when internal funds are inadequate.<sup>15</sup> Then, financial assets and financial liabilities on the balance sheets are negatively correlated, which captures the fund flows of firms borrowing external funds and investing internal funds at the same time. More specifically, when a firm intends to finance investments, it begins with a decrease in liquid assets, such as cash holdings or bank deposits, and then turns to borrow from banks or issue new bonds either because internal funds are inadequate or because the firm plans to keep some liquid assets for daily operations. Thus, we should observe that financial assets and financial liabilities move in opposite directions.

However, banks take deposits and make loans, resulting in the same direction of movements in financial assets and liabilities. If firms serve as financial intermediaries by simultaneously borrowing and lending, they may exhibit a similar pattern, and the

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<sup>15</sup> For the purpose of our identification, we do not need firms to strictly adhere to pecking order theory. As long as internal financing is the first shot, the strategy still works. And we will make a simple test of the hypothesis in the appendix.

pecking order theory would be violated. Then, financial liabilities will not exhibit a negative correlation with financial assets, or even show a positive relationship because firms tend to re-lend a proportion of funds raised to other firms and keep the remaining funds in financial assets waiting for future usage.

In employing Strategy 1 to detect shadow banking activities, we conduct regressions of financial assets on financial liabilities (both scaled by total sales). A positive and statistically significant relationship will lend support to the existence of re-lending activities.

To facilitate our test, we use the subsample of U.S. firms as a benchmark, and compare the results of the sample of Chinese firms with those of U.S. firms to further detect the potential re-lending activities of Chinese firms.

We will also compare the activeness of firms with different ownership types in participating re-lending activity, i.e., central government-controlled firms (central SOEs), local government-controlled firms (local SOEs), private-controlled firms, foreign-controlled firms, etc..

**Strategy 2** This strategy is inspired by Japan's experience in the 1980s. Non-financial firms in Japan conducted a "carry trade" to earn profits through issuing corporate securities at low costs in international markets and depositing the raised funds into banks as time deposits to earn high interest rates following the liberalization of the Japanese banking system. Thus, non-financial firms could earn money on the interest rate spread and change their roles vis-à-vis those of banks from debtors to creditors. Hattori et al. (2010) identify carry trade by observing the reverse

correlation between liquidity ratio and business fixed investment. If non-financial firms operate normally, the liquidity ratio should be negatively correlated with business fixed investment, because of high opportunity costs of cash holdings either from financial liabilities or from internal funds, and firms would be optimally matching the timing of fund raising and business fixed investment. Nonetheless, these costs would decrease if firms could deposit available funds into banks to earn interest income, so that the correlation becomes loose or even vanishes.

There is a similar case in China. Firms do not need to worry about time mismatch if they could re-lend the surplus funds to other firms. Thus, we conduct regressions of liquid financial assets on business fixed investment. A non-negative correlation implies the existence of re-lending activities.

The above two strategies mainly try to capture the re-lending activities by observing financing patterns of non-financial firms. The following analysis turns to examine specific cash inflows and outflows associated with certain re-lending business in corporate balance sheets. The analysis is centered around the account of other receivables where re-lending activities are mostly recorded.

**Strategy 3** According to our interview with industry experts in China, the re-lent loans on balance sheets of non-financial firms are usually put into the accounts of “other receivables” or “short-term investments”. As balance sheets usually do not provide details about “short-term investments”, we therefore focus on “other receivables” as the account reflecting re-lending activities for the analysis.

The constituents of “other receivables” are varied, containing loans to employees

and other companies, settlement amounts due for non-current asset sales, rents receivable, term deposits, etc. These businesses are not ordinary transactions, and simple surveys of footnotes in financial statements indicate that a proportion of other receivables are associated with lending activities. It is noteworthy that other receivables only capture a fraction of re-lending activities.

In normal operation of non-financial firms, the ratio of other receivables to sales maintains a stable trend, especially for firms operating in the same industry. If firms exhibit a relatively high ratio over a certain period, compared to the mean and median ratios of the same industry, it is reasonable to conjecture that these firms are involved in shadow banking activities.

We first carry out regression analysis of other receivables on financial liabilities (both scaled by total sales). A positive relationship indicates that firms borrow funds for re-lending and put the income generated by re-lending into the account of other receivables. The regressions include trade receivables to control for the practice of trade credit as a consistent sales habitual practice of some firms, and free cash flow is included to control for the sufficiency of available funds to participate in such activities outside the main business.

Next, we trace shadow banking activities by observing the flow of income generated from re-lending. According to accounting standards, the interest income from bank deposits is incorporated into the item of “interest revenue”, but the interest income generated from re-lending to other firms is not allowed to put into this item. Based on the information obtained from our interview with industry experts and

review of corporate reports, some firms use the interest revenue from re-lending to write down “financial expenses”, and others allocate it to the item of “other operating income”. For example, Shenzhen SJET Supply Chain Co., a non-financial firm, is engaged quite much in re-lending activities, the scale of which reaches 420 million yuan; before the establishment of a financial subsidiary to deal with these businesses in 2013, the firm recorded the loans in the item of “other receivables” and put the revenue into the item of “non-operating income”. Thus, we can examine the relationship between other receivables and other operating income or financial expenses to detect re-lending activities.

### *3.2 Sample description*

We collect a sample of 2549 companies in China during the period 1990-2013 with 32769 firm-year observations, and much of our analysis focuses on the period 2006-13 when re-lending is prevalent. The firm level data mainly comes from Compustat Global database, supported by Standard & Poor’s financial services, which provides accounting data. We also supplement the data from the Wind database, which provides information on the ownership nature of companies, stock prices, earning indicators, shareholder identity and structure, institutional investors’ stockholdings, etc. These two databases are merged using ISIN code<sup>16</sup>. Observations lacking necessary financial variables such as cash and short-term investment, total receivables, and plant, property and equipment (PPE) are dropped from the sample.

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<sup>16</sup> We exclude observations without ISIN code, and if one firm has two ISIN codes or one ISIN is connected to two firms, these observations are also dropped. Besides, we exclude the observation with ISIN code but without firm name. Then the data left consists of 27521 observations, 2305 firms.

After the exclusion, the data set consists of 2303 firms and 27417 observations.<sup>17</sup>

The selection of Compustat database for all relevant balance sheet items is for the convenience of comparison between Chinese companies and the U.S. ones because the accounting standards and industry classifications are maintained to be consistent between Compustat Global and Compustat North America. This ensures comparable application of U.S. industry level data to the same industry in China in the following analysis.

[Table 1]

Table 1 presents some descriptive statistics over the period of 1990-2013 in Panel A and 2006-2013 in Panel B. The financial information in each year is quoted from the financial reports of the preceding year. Since what we are interested in is the re-lending activities, the focuses are variables used in the identification process. The table shows that the mean of financial assets and financial liabilities are 768.5 million and 1522 million Yuan, with large deviations, respectively. It is also observed that the mean ratios of total receivables to total assets and other receivables to total assets are 0.18 and 0.04, respectively. We also report some fundamental financial information of firms as control variables in regressions: firm size, growth of total assets, sales, leverage, ROA and P/E ratio. Since corporate governance variables like ownership structure may influence the firm's decisions on whether to do re-lending, we also include some shareholder identity information. It shows that the proportions of local SOEs, central SOEs and PEs in this sample are 34%, 15% and 42%, respectively,

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<sup>17</sup> The actual size of sample used in different analysis depends on the data availability and is indicated in each step.

which indicates that private-controlled firms are the most prevalent form. As expected, the mean fraction of shares held by the largest shareholder (Block) is 0.39, indicating a fairly concentrated ownership structure. The average fraction of shares controlled by institutional investors is 25.83%. As institutional investors often help to monitor firm operations, the proportion of institutional investors' shareholding may affect re-lending business. Besides, we also consider the percentage of firms in which banks are among the top ten largest shareholders because a close tie with banks leads to an easy access to financing and surplus funds for re-lending. Thirty percent of 27417 firm-year observations involve banks as controlling shareholders. The patterns of key variables over 2006-2013 is similar with variations in 1990-2013.

[Figure 1 and 2]

Figure 1 depicts the movements of financial assets and liabilities more clearly. Financial assets and liabilities are both scaled by sales and winsorized at 1% and 99% since sales exhibit large variations. The figure indicates that these two variables are almost co-moving, contrary to the predictions of the pecking order theory. Figure 2 shows the trend of median business fixed investment growth rate and liquid financial assets scaled by sales. We observe a change in correlation between cash holdings and the timing of business fixed investment. Before year 2000, liquid assets held by non-financial firms exhibited a reasonable negative relationship with lagged growth rate of investment, but later the negative correlation gradually vanished, and these two variables became positively correlated except during the financial crisis period. These two figures both give the directions for multivariate analysis in Section 5.



## **5. Empirical Results**

### *5.1 Detecting shadow banking activities in non-financial firms*

#### *5.1.1 Strategy 1: financial assets and financial liabilities*

Panel A in Table 2 presents the regression results for the sample of Chinese firms. Explanatory variables include financial liabilities scaled by sales, firm size, ROA, and leverage. Financial assets incorporate short-term investments and cash holdings, and financial liabilities are equal to the sum of short-term debts and long-term debts.

[Table 2]

Column 1 shows that financial assets are positively associated with financial liabilities, and the estimated coefficient is statistically significant at the 1% level. This indicates that these two variables co-move over the sample period, which is contrary to the prediction of the pecking order theory. Columns 2-4 report that the statistical significance and the positive relationship are unchanged after including firm-level controls, firm and year fixed effects. This unusual correlation implies unusual financing activities. One may argue that holding the funds raised in the form of cash or short-term investments is for the firm to wait for a better timing to conduct fixed investments. It is noteworthy, however, that the opportunity costs of holding funds are relatively high because of high interest rates charged by banks. Hence, firms typically have clear investment plans before borrowing money. Besides, we will exclude the possibility of waiting for investments by examining the relationship between liquid

financial assets and business fixed investments in the subsequent analysis; we will also reinforce our conjecture that parts of borrowed funds are devoted to re-lending business by observing the co-movements of other receivables and financial liabilities.

Next, in Column 5, we take the U.S. firms as a benchmark to do analogous analysis. The estimated coefficient of financial liabilities is significantly negative, which presents a striking contrast to the Chinese firms.

[Figure 3]

In addition to the different patterns documented in empirical results, Figure 3 shows that Chinese firms and US firms behave differently in accumulating cash holdings. Some large US firms, such as Microsoft and Apple, tend to accumulate cash holdings through issuing bonds, which is often regarded as precautionary savings. Hence we should take this issue into consideration when we examine the correlation between financial assets and financial liabilities to identify the existence of re-lending business. Though the results in Table 2 have confirmed that the mode of accumulating cash holdings and issuing bonds contemporaneously is not universal across US firms, Figure 3 provides more clues to understand this issue. We could observe that the median ratio of either financial assets to sales or financial assets to total assets is much higher for Chinese firms than for US firms, indicating that non-financial firms in China play abnormally in the subject of financial assets.

In China, large firms and SOEs always have better access to credit markets. Since different degrees of credit constraints affect the availability of funds for re-lending, it is hypothesized that less credit-constrained companies are more likely to

engage in shadow banking activities. Table 3 shows the regression results for the subsamples of local SOEs, central SOEs, private-controlled companies, widely-held companies and foreign-controlled firms. Obviously, firms with different ownership types behave differently. The estimated coefficient of financial liabilities is negative and statistically significant in the subsample of private-controlled firms and positive and insignificant in the subsample of foreign-controlled firms, which indicates that private-controlled firms and foreign-controlled firms apparently do not participate actively in the re-lending business. In contrast, central SOEs, local SOEs and widely-held companies all produce positive estimated coefficients which are significant at the 1% level. The positive correlation between financial assets and financial liabilities is most prominent for central SOEs, where a one percentage point increase in the ratio of financial liabilities to sales translates into a nearly 0.16 percentage point increase in the ratio of liquid financial assets to sales.

These results are consistent with our expectation. On the one hand, private-controlled firms face more difficulties than do SOEs in obtaining external finance for investments so that they lack sufficient funds to re-lend to other firms; on the other hand, private-controlled firms have higher profitability and productivity growth than do SOEs (Nazrul et al., 2006; Dollar and Wei, 2007; Song et al., 2011, etc.). Consequently, re-lending business is not very attractive for private-controlled firms, while SOEs often lack good investment opportunities so that they are more attracted to the re-lending business outside their main business lines.

[Table 3]

### *5.1.2 Strategy 2: financial assets and business fixed investments*

An increase in business fixed investments would lead to a decrease in cash holdings when firms operate normally so as to minimize the opportunity costs of holding idle funds. In contrast, if firms borrow from banks in order to re-lend, obviously the relationship between liquidity ratio and business fixed investment becomes weak or even reversed because firms do not need to match the timing of raising funds and that of disbursements for investments carefully to avoid high opportunity costs of cash holdings. Furthermore, excess demand for finance under financial repression leads to a seller's market for loans; re-lending firms have the priority to set interest rates and terms of loans. This advantage loosens the relationship between business fixed investments and liquid financial assets further.

[Table 4]

Table 4 presents the regression results with different samples. Without re-lending business, an increase in business fixed investments would induce a decrease in liquid financial assets (e.g., cash holdings). U.S. firms follow the normal pattern: Column 5 shows that business fixed investments keep a negative correlation with financial assets.

Then we turn to examine the data for Chinese firms. In Column 1, the estimated coefficient of business fixed investments is significantly positive in the whole sample, indicating that firms' internal funds are not likely used for real investments. In Columns 2-4, both state-controlled and private-controlled firms display a positive

correlation between business fixed investment and financial assets, whereas widely-held companies do not.

*5.1.3 Strategy 3: Tracing out the shadow banking activities on the financial statements*

Firstly, we examine the correlation between financial liabilities and other receivables to detect whether a fraction of borrowed funds would be used for re-lending business.

[Table 5]

Table 5 indicates that financial liabilities are strongly positively associated with other receivables. In the regressions, we add free cash flow to control for the availability of funds, and trade receivables to control for the size of receivables account closely related to trade or other normal business activities. In the whole sample regression in Column 1, a one percentage point increase in the logarithm of financial liabilities to sales corresponds to a 0.15 percentage point increase in the logarithm of other receivables to sales ratio, which is statistically significant at the 1% level. Column 5 presents the regression results for the sample of U.S. firms. There is also significant correlation between financial liabilities and other receivables. But we observe that the same model produces a lower explanatory power ( $R^2$  around 3.8%) for the sample of U.S. firms.

In Columns 2-4 of Panel A, we present the regression results for the sub-samples of state-controlled firms, private-controlled firms, and widely-held firms, respectively. Clearly, there is significant correlation in all the three groups. Nonetheless, the

estimated coefficient of financial liabilities for private-controlled firms is the smallest, suggesting that private-controlled firms may be engaged least in re-lending business.

In Columns 1-2 of Panel B, we examine the differential patterns of state-controlled firms and private-controlled firms by adding interaction terms of financial liabilities with SOE dummy and PE dummy. It is shown that state-controlled firms (private-controlled firms) have a tighter (looser) correlation between financial liabilities and other receivables than do non-state-controlled firms (non-private-controlled firms). Thus, a higher proportion of external funds raised flows into other receivables in SOEs, and they are more engaged in re-lending business.

One caveat is that we focus on the re-lending business covered in “other receivables” in this study, though re-lending firms may put the re-lent loans into other accounting items such as “short-term investments”. These un-examined accounts, however, usually do not have subsidiary accounts to specify the movements of funds for re-lending business, and more importantly, firms in the same industry do not have a convergence trend in these items, while “receivables” series items, i.e., the ratio of total receivables to sales, are close for firms in the same industry according to trade literature, which facilitates the detection of firms conducting re-lending and the comparison between Chinese firms and U.S. firms. Given the opacity of re-lending business, what we catch from “other receivables” is most likely still an underestimated figure of the actual amount of re-lending business.

To further address the potential noise contained in other receivables, we employ the industrial median of the ratio of other receivables to sales of U.S. firms as

benchmark, and subtract it from the ratio of other receivables to sales of Chinese firms engaged in the same industry. Presumably this U.S. benchmark-adjusted ratio can exclude the impacts of some normal factors on the variation of other receivables and capture better the effects of re-lending activities. In Columns 3-5 of Panel B, we conduct regressions for the whole sample, the state-controlled group and the private-controlled group, respectively. We find that financial liabilities are significantly correlated with U.S. benchmark-adjusted other receivables/sales ratio in the whole sample and in the sub-sample of state-controlled firms, whereas the correlation in the private-controlled subsample is positive but statistically insignificant. This finding is consistent with other results in Table 5, and mitigates to some degree our concern with the appropriateness of the measure of other receivables.

Then we turn to trace the interest income generated from re-lending business. Table 6 presents the regression results with “non-operating income” and “financial expenses” as dependent variables.

[Table 6]

In Column 1 of Panel A, we observe statistically significant positive relationship between other receivables and non-operating income in the whole sample. Columns 2-5 compare the state-controlled firms and the private-controlled firms. Clearly, state-controlled firms exhibit a much stronger positive correlation between other receivables and non-operating income.

Meanwhile, Panel B of Table 6 examines the relationship between other receivables and financial expenses. Since financial expenses are mainly determined

by interest expenses generated by corporate debts, we include financial liabilities as control variable in the model. Column 1 presents a significant and negative relationship between other receivables and financial expenses, suggesting that revenues from re-lending are used to cover financial expenses<sup>18</sup>. Columns 2-5 compare the state-controlled and private-controlled firms. Both groups show a negative correlation between other receivables and financial expenses, and there is no striking difference between the two groups.

## *5.2 The role of policies in re-lending business*

### *5.2.1 The impact of monetary policies on re-lending business*

To better explore the mechanism of re-lending business, we examine the variation of such activities over different periods of policy changes and the impacts on the relationship between financial assets and liabilities. Since monetary policies are mostly exogenous to non-financial firms but exert an undeniable impact on firms' subsequent financing decisions, exploring the role of monetary policies provides a clean setting to better identify the re-lending business. We choose two kinds of policies: monetary policies and government policy responses to crisis. The intuitions behind these policies are straightforward: the tight or loose monetary policies affect the available funds for re-lending business by different firms differentially; similarly, the crisis responses, especially the four trillion yuan stimulus plan in the 2008 financial crisis, have differential effects on shadow banking activities of different

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<sup>18</sup> In contrast, the correlation between other receivables and financial expenses are significantly positive before 2006.



firms and across different industries. In essence, the identification strategy is a Difference-in-Differences (DID) approach.

Taking into consideration both the fact that related loans have been cleaned up from the account of other receivables after 2006 and the availability of data for monetary policies, we employ quarterly data in the period 2007-2013 for this part of analysis. Monetary policy indicators include deposit reserve ratio, M2 and Shanghai interbank offered rate (SHIBOR); we also quote social financing data to measure bank loan availability from PBC for robustness check. When deposit reserve ratio and SHIBOR are decreased (increased) and M2 is increased (decreased), monetary policy is expansionary (contractionary).

[Table 7]

Panel A in Table 7 presents the regression results to show the impacts of monetary policies on the relationship between financial assets and financial liabilities.<sup>19</sup>

First, we should note that the inclusion of monetary policy indicators doesn't change the sign and significance of the estimated coefficients of financial liabilities in these regressions. We add the dummy variables for tightness of monetary policy and the interaction term of these indicators with the key variable, financial liabilities. The results show that the relationship between financial assets and financial liabilities becomes loose when monetary policies are tight, whatever monetary policy indicator is used.

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<sup>19</sup> For brevity, we use Strategy 1 in this part of analysis. Results for other strategies are qualitatively similar.

The negative impact of tight monetary policy is logical: the precondition to re-lending business is that firms are able to obtain funds from banks or bond markets to lend; monetary tightening would make the amount of available funds for lending shrinks and thus re-lending activities are negatively affected. The results are consistent and complementary with empirical finding in Chen et al. (2016), which shows that entrusted lending of nonbank trustee decreases in response to tight monetary policy. Also, the positive coefficients of tight monetary policy indicator are meaningful, suggesting that non-financial firms tend to keep more liquidity assets for cautionary purpose in monetary tightening periods.

Panel B shows the impacts of monetary policies on SOE and PE subgroups. Columns 1-4 show that a monetary tightening measured by deposit reserve ratio and SHIBOR statistically significantly weaken the relationship between financial assets and liabilities for both SOE and PE subsamples, and the impact is larger in magnitude for private-controlled firms than for state-controlled firms. Columns 5-6 show that a tight monetary policy measured by M2 significantly weakens the relationship between financial assets and liabilities for private-controlled firm group only but not for state-controlled group.

In Panel C, we also explore the different patterns of state-controlled firms and private-controlled firms further by adding interaction terms of ownership dummies and monetary tightening indicator variables<sup>20</sup>. Clearly, state-controlled firms are less adversely affected by monetary tightening than do non-state-controlled firms.

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<sup>20</sup> If applying SHIBOR indicator, the results are very similar.

In general, private-controlled firms were hit harder by tight monetary policies than did state-controlled firms. This may be because private-controlled listed firms are still slightly disadvantaged in getting access to external finance compared with state-controlled companies. During periods of monetary tightening, private-controlled companies are more affected by the shrinkage of bank loans, and thus they are engaged less in shadow banking activities.

For robustness checks, we employ bank loan and entrusted loans data from social financing statistics to examine the impacts of the upstream available funds on re-lending business. The item of RMB bank loans represents the total amount of loans the society could obtain from banks; entrusted loans are the total amount of entrusted loans, a kind of substitute for direct loans between two firms, as illustrated in section 3. It's reasonable to hypothesize that the more available bank loans there are in the economy, the more firms can carry out re-lending business; but the case of entrusted loans are ambiguous: on one hand, more funds devoted to entrusted loans lead to fewer funds for re-lending business; on the other hand, firms that are active in entrusted loans business may also focus on re-lending business.

In Table 8, we observe from Columns 1-4 that a large amount of bank loans or entrusted loans would strengthen the positive relationship between financial assets and financial liabilities (see the interaction terms of financial liabilities with bankloans, and entrusted loans). This suggests that re-lending business is more active when there are more bank loans available in the economy so that non-financial firms can more easily borrow bank loans to re-lend to other firms. This finding reinforces

the conclusions of negative effects of monetary tightening as more bank loans suggest a more loose monetary environment. Similarly, when entrusted loan business is in boom, direct re-lending business is also booming, which suggests that the two forms of shadow banking activities may well complement each other. Besides, we also observe that more bank loans in economy would decrease the amount of liquidity financial assets held by non-financial firms, possibly due to no worries about shortage of funds in the loose environment.

[Table 8]

Columns 5-6 consider the different patterns of SOEs and PEs. Clearly, state-controlled firms ride on the formal credit boom more strikingly than non-state-controlled firms, whereas private-controlled firms perform worse than non-private-controlled firms in re-lending activities in periods of formal credit boom.

In short, tight monetary policies impede the involvements of non-financial firms in re-lending business, probably through the shrinkage of the availability of upstream funds that firms could obtain from banks or corporate bond markets.

[Table 10]

### *5.2.2 Re-lending in the global financial crisis episode*

Another episode we're interested in is the 2008 global financial crisis. During this period, the exports of Chinese firms were heavily affected and many small firms went bankrupt; export volume decreased by 8.2% in 2008 and total export and import volume decreased by 13.9%<sup>21</sup> in 2009. The normal operations of firms face

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<sup>21</sup> Data is quoted from official website of Ministry of Commerce:  
<http://zhs.mofcom.gov.cn/aarticle/Nocategory/201004/20100406888239.html>.

great challenges and thus it is reasonable to conjecture that re-lending business would shrink since firms devote most of their efforts to seeking survival. But Chinese government launched four trillion yuan stimulus plan in November 2008, injecting more liquidity into markets. Large state-owned banks were advised to help the implementation of the stimulus plan and thus had expanded credit supply since the 4<sup>th</sup> quarter of 2008. For firms in key industries favored by this government plan, they had better access to obtain bank loans. These two counteracting forces make the impact of the crisis ambiguous.

We add a crisis dummy variable into models as well as the interaction term. We define 2008 Q4 to 2010 Q4 as the crisis period because from the fourth quarter of 2008 the sign of recession in exports was just beginning to emerge and the government launched the rescue plans in November 2008. Also the choice of the ending quarter is identified with the ending time of the four billion yuan plan.

In Table 9, we could observe that the interaction term of the crisis dummy and financial liabilities produces a negative estimated coefficient. Hence, the relationship between financial assets and financial liabilities is weakened in the financial crisis period, which suggests that financial crisis deters non-financial firms from engaging in re-lending activities to some extent. Meanwhile, the crisis dummy itself produce a positive impact on financial assets, suggesting that firms tend to hold more cash holdings in the crisis period; this is consistent with the results in tight monetary policy parts.

Columns 3-4 look at the subsamples of state-controlled firms and private-controlled firms, respectively. Re-lending activities were curbed in both types of listed firms in the crisis episode, and the decline for private-controlled firms is more striking. Columns 5-6 compare the re-lending activities of state-controlled firms and private-controlled firms in the context of the whole sample by adding triple interaction terms of financial liabilities, financial crisis and ownership type indicators. It is shown that state-controlled firms were less hit in re-lending activities than non-state-controlled firms, whereas private-controlled firms were more affected negatively than non-private-controlled ones.

Combing these two results, it can be concluded that the 2008 financial crisis curbed the re-lending business, and the negative impact was larger for private-controlled firms than for state-controlled ones.

## **6. Factors Influencing Firms' Re-lending Business**

The above analysis has indicated that shadow-banking business is more prominent in state-controlled firms than in private-controlled firms, and we conjecture that this difference is due to the better access of SOEs to formal external finance on the one hand and more profitable business opportunities in private-controlled firms on the other hand. Thus, we are motivated to examine potential factors from three sides: firms' growth opportunities and profitability, corporate governance structure, and credit or liquidity constraints. If a firm has many promising investment projects and growth opportunities, it would not have many idle funds to engage in such an illegal

and illegitimate business. If a firm is more credit-constrained or operates in an industry with more external finance dependence, it may lack sufficient funds to do re-lending. Besides, corporate governance structure, such as ownership structure, may affect the decision-making on normal operations. In general, a company with stronger corporate governance may be less likely to do re-lending because of illegitimacy of the business.

As the account of other receivables catches a big chunk of re-lending business, we use it as a proxy for re-lending activities and focus on the analysis of the factors influencing the variation in the size of other receivables.

### *6.1 Growth Opportunities*

Table 10 provides an analysis of growth factors affecting the degree of involvement in shadow banking business. We employ other receivables scaled by total assets as dependent variable. Growth and profitability factors include lagged ROA, P/E ratio (a stock's price divided by the company's after tax earnings over the 12 month period), growth rate of total assets, and profit growth. We also include log ratio of total assets to control for size effect.

[Table 10]

From Columns 1-5, we observe that firms with higher profitability (lagged ROA), better growth prospects (higher P/E ratio), and stronger business growth (total assets growth) display a smaller size of re-lending activities. Overall, the results in Table 10 signify that fast-growing companies tend to focus on their main business line and are less involved in re-lending business.

Columns 6 and 7 conduct regressions for the subsample of state-controlled companies and private-controlled one, respectively. A high P/E ratio plays a significant role in curbing re-lending in the group of state-controlled group, but not in the private-controlled group. A high profitability (ROA) and asset growth significantly deter re-lending in private-controlled firms.

### *6.2 Corporate governance*

We are also interested in the role of corporate governance in re-lending business. Re-lending is illegal and illegitimate, which contains substantial legal and regulatory risks. Then, firms with stronger corporate governance are expected to be less likely to conduct re-lending.

To explore the impact of corporate governance mechanism, we choose five governance measures: the percentage of shares held by the largest shareholder (Block), concentration of shareholding by top ten shareholders (Herfindahl\_10), whether CEO is the chairperson of the board of directors (chairmanCEO), percentage of shares held by directors (shareratioofdirector), and the proportion of outside (non-paid) directors (ratio\_nonpaidDIR). These measures are related to the conflicts of interests between shareholders and managers and between large shareholders and minority shareholders.

In Columns 1-5 of Table 11, we first put each governance measure into the regression separately. Each of them produces statistically significant effects. Clearly, more concentrated ownership structure, a larger shareholding by directors, a separation between CEO and board chairperson, and a higher proportion of outside



directors in the board would help curb the re-lending activities. In Column 6, we put all these factors together into the regression. The latter three factors still produce negative and significant estimated coefficients. The relatively lower importance of ownership concentration in suppressing re-lending may reflect the fact that ownership concentration contains considerable risks of expropriation of minority shareholders by large shareholders in emerging markets. Columns 7 and 8 carry out regressions in the sub-sample of state-controlled firms and private-controlled firms separately. It is shown that largest shareholder ownership share, directors' shareholding, and the fraction of outside directors play a particularly significant role in containing re-lending in the group of state-controlled firms, whereas a high level of ownership concentration of top shareholders and directors' shareholding is more effective in reducing re-lending in the group of private-controlled firms.

Overall, the results demonstrate that strong corporate governance can help curb re-lending activities.

[Table 11]

### *6.3. Credit Constraints*

To engage in re-lending business, non-financial firms should have abundant free cash flows or reliable fund-raising channels, or the normal operations of main business may be affected. We investigate the impacts of credit constraints and external finance dependence on re-lending activities. We adopt four measures: External finance dependence (EFdependence), Inventory (Inven), Tangibility and Trade Credit (TrCredit). EFdependence is calculated as capital expenditure minus the

sum of cash flow from operations plus decrease in inventories and increase in payables divided by capital expenditure; it gauges external funding requirements for long-term projects. Inven equals the ratio of inventories to sales and presents the duration of production cycle and the needs for short-term funds. Tangibility is the proportion of net plant, property and equipment (PPE) in total book asset value, and measures the scale of assets firms could use as collateral to raise funds. TrCredit is defined as the change in accounts payable divided by the change in total assets; trade credit is one form of finance complementary to formal credit channels<sup>22</sup>.

The calculation of these measures utilizes the data from North America Compustat database for all U.S. firms and is based on year-by-year industry median. We select U.S. firms as benchmark rather than using the Chinese corporate data directly for several considerations. U.S. firms operate more closely to steady-state equilibrium and the U.S. financial markets have fewer frictions, so the data could more accurately reflect the demand for external finance by each industry in the absence of binding credit constraints.

[Table 12]

Table 12 provides regression results. Columns 1-4 present the results on the impacts of each of the four measures on re-lending separately. As expected, Columns 1 and 4 (the external finance dependence and trade credit) show that re-lending business is less active for firms in industries that are more dependent on external finance. The more external funds the industry demands, the fewer other receivables

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<sup>22</sup> These measures are quoted from Rajan and Zingales (1998), Kroszner et al. (2007) and Monava (2008, 2011, 2012), and these papers have illustrated the choice and calculations of such measures in detail.

and fewer shadow banking activities there are. Conversely, abundant trade credit promotes re-lending business (Column 4). High balances in TrCredit provide part of short-term funds for firms. Obviously, firms would do more re-lending if they are less liquidity constrained. However, the ratio of inventories to sales and tangibility are not related to involvement of firms in re-lending. Column 5 puts all the four measures together into the regression, and the delivers the same conclusion.

When examining the role of credit constraints in the state-controlled and private-controlled subsamples in Columns 6 and 7 respectively, we find that external finance dependence would diminish significantly re-lending activities of private-controlled firms, whereas state-controlled companies do not exhibit significant effect. Meanwhile, a higher amount of trade credit (and thus a relief of liquidity constraint) would push private-controlled firms to do more re-lending, whereas it has no significant effect in the group of state-controlled firms.

These results show that private-controlled firms are much more subject to liquidity constraints than do state-controlled firms, and consequently their relending activities are more sensitive to the availability of liquidity.

Overall, firms are more likely to engage in re-lending business if they have fewer growth opportunities and weaker corporate governance structure, and operate in industries with less external finance dependence or a higher frequency of trade credit. Referring to ownership nature, state-controlled firms are affected more by growth opportunities but less by the state of industries' credit constraints.

Table 13 provides a comparison of the median values of various measures of firm profitability and growth opportunity, corporate governance, and credit/liquidity constraints between state-controlled firms and private-controlled firms. Strikingly, private-controlled firms dominate state-controlled firms in all the measures of profitability and growth opportunity. In terms of corporate governance, the difference is less clear-cut. State-controlled firms show a higher degree of ownership concentration and a higher proportion of outside directors, whereas private-controlled firms display a higher level of director shareholdings.

When we turn to credit and liquidity constraints, we find that state-controlled firms exhibit a higher degree of dependence on external finance, a higher degree of asset tangibility, a smaller inventory, and a lower level of trade credit than do private-controlled firms. This is consistent with the facts that state-controlled firms are more frequently engaged in capital-intensive industries and have better access to formal finance than do private-controlled firms. The easy access to formal financial system makes the industrial characteristics of external finance dependence, etc. play no significant part in affecting the firms' participation in the re-lending activity. Hence, we observe that state-controlled firms are less subject to credit or liquidity constraints in table 12 when they consider embarking on re-lending business.

Combining Table 13 with the results in Tables 10-12, we find that the lower profitability of main business, lack of growth opportunity, and easy access to formal financial system are likely to be the most important reasons for state-controlled firms to be engaged in shadow banking activities more intensively.

One concern may be whether other receivables are an accurate measure of re-lending business. Some segments of other receivables are not related to the re-lending business. It needs further exploration in future research to solve this problem.

## **7. Conclusions**

Despite a large literature on the shadow banking system in the advanced economies, the attention paid to their counterparts in emerging economies has been scant. This paper studies re-lending business of non-financial firms, an important aspect of shadow banking activities in emerging markets based on the experience of corporate China. Firms do not conform to the predictions of the pecking order theory that changes in financial assets and liabilities tend to move in opposite directions when internal and external funds are both applied in financing investment projects. The engagement in re-lending business leads to a simultaneous increase in financial assets and liabilities because firms behave as financial intermediaries in such a case. The non-negative correlation between liquid financial assets and lagged business fixed investments show that spare funds stay as cash holdings waiting for usage rather than financing investment projects, which further supports the existence of re-lending business. We find that financial liabilities always maintain a significantly positive relationship with other receivables, in which re-lending business is typically recorded, indicating that part of external funds raised indeed flow into re-lending loans. Besides, an increase in other receivables will lead to an increase in non-operating income and a decrease in financial expenses, two of which stand for the interest income from re-

lending business after 2006. We should also notice that state-owned enterprises participate more prominently in re-lending business. For robustness, we introduce exogenous monetary policy indicators into our analysis, and find that the signs and statistical significance of all regression results are consistent. Tight monetary policies impede firms to engage in re-lending business. These results support the prevalence of re-lending business over the sample period.

We examine the factors affecting the extent of participation in re-lending business for non-financial firms. We show that firms with higher profitability and better growth opportunities are less likely to do re-lending. We also find that firms with stronger corporate governance features are engaged less in re-lending business. Finally, we observe that external finance dependence restricts firms to do re-lending since strong external finance represents longer period of turnover of cash flows; meanwhile, trade credit provides more short-term liquidity for firms, promoting the developments of re-lending; still the results show that state-controlled enterprises are less affected by an industry's external finance dependence.

By comparing state-controlled and private-controlled firms in terms of profitability and growth opportunity, corporate governance and credit/liquidity constraints, we find that state-controlled companies have lower profitability and fewer growth opportunities in their main business lines, but have better access to formal external finance. Thus, state-controlled companies show a stronger tendency to be involved in re-lending. The development of re-lending business has some positive impacts on Chinese financial system. First, it provides alternative financing channel

for SMEs, which have tremendous difficulties in accessing formal finance. Thus, re-lending promotes the growth of private businesses. Second, it solves part of information asymmetry in the process of granting bank loans in that firms usually lend to familiar borrowing firms and frequently have dealings with each other, so that lending firms get a relatively clear picture of the borrower, compared with the situations in bank loans. Besides, the negotiated interest rates on re-lending loans may provide a platform for testing liberalization of interest rates in China, promoting the marketization of financial system. But it should be noted that the re-lending business is out of regulation and brings potential risks into financial system. Regulatory authorities are expected to pay attention to this business.

Though we describe an important part of shadow banking activities in non-financial firms, it's just the tip of iceberg in the Chinese shadow banking sector. These activities are actually motivated by regulatory policies and immature financial markets. More forms of similar activities will emerge continuously as long as these issues are not resolved. We may conjecture that entities located in tight regulation areas are more likely to participate in various types of shadow banking activities, a prediction waiting for future studies. Furthermore, the economic consequences and risks brought by financial intermediary activities beyond financial industry need to be examined for future research, either empirically or theoretically; re-lending of funds among non-financial firms may improve the micro-level capital allocation and eliminate the financial frictions to a certain extent, since it is possible for capital to flow into firms with higher productivities and more investment opportunities. But the

risks cannot be ignored since they're financial activities directly carried out in the real economy. At another level, monetary policies should be taken into consideration. Tight and loose monetary policies generate different market conditions for the development of shadow banking activities through distinct transmission mechanisms; conversely, the development of shadow banking business may influence the effectiveness and process of normal monetary policy transmission mechanisms, which we will leave for future studies.



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**Table 1 Summary statistics.**

This table shows the summary statistics of key variables over the sample period of 1990 to 2013 in Panel A and 2006-2013 in Panel B. The data is from Compustat and Wind database. *FinAssets* is the sum of cash holdings and short-term investment; *FinLiabilities* is financial liabilities that is equal to the sum of short-term debts and long-term debts; *TREC\_TA* is a ratio of total receivables to total assets; *OREC\_TA* is a ratio of other receivables to total assets; *Fin expense* is financial expenses; *netPPE* is the item of net property, plant and equipment; *size* is log of total assets; *growth* is the growth rate of total assets; *leverage* is defined as total liabilities divided by total assets; *ROA* is return on assets; *PEratio* equals a stock's price divided by the company's after tax earnings over the 12-month period; *Local SOE*, *Central SOE* and *PE* are dummy variables indicating local government owned enterprises, central government owned enterprises and private enterprises, correspondingly; *Block* is the percentage of shares held by the largest shareholder; *Ins* is the percentage of shares held by institutional investors; *Bank* is a dummy suggesting that banks are among the top ten largest shareholders.

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Panel A: 1990-2013

	N	Mean	Median	P25	P75	Min	Max	Sd. dev
<i>FinAssets</i>	31534	768.5	188	58.43	500.8	0	118365	3488
<i>FinLiabilities</i>	31513	1522	196.5	47.58	645	0	495629	9514
<i>TREC_TA</i>	31436	0.177	0.153	0.0778	0.249	0	1.166	0.129
<i>OREC_TA</i>	31424	0.0459	0.0176	0.00607	0.0524	-0.0189	1.043	0.077
<i>Nonoperating income</i>	31533	54.44	5.643	-1.211	27.7	-50680	55403	680.8
<i>Fin expense</i>	21497	99.48	15.39	3.71	47.8	-30.2	26957	551.4
<i>netPPE</i>	27417	1398	326.5	131.1	842.5	-472.3	425994	7900
<i>size</i>	27402	7.175	7.1	6.366	7.921	-2.976	13.39	1.273
<i>growth</i>	25084	0.81	0.133	0.0231	0.319	-1	4723	40.01
<i>sales</i>	27417	2870	675.9	280.8	1772	-98.39	585480	14805
<i>leverage</i>	27383	0.551	0.476	0.322	0.616	-0.195	1013	6.334
<i>ROA</i>	27417	0.0608	0.0535	0.0209	0.0959	-64.82	64.75	0.573
<i>PEratio</i>	22080	93.47	40.34	22.57	74.36	-37798	59049	758.9
<i>LocalSOE</i>	27270	0.339	0	0	1	0	1	0.473
<i>CentralSOE</i>	27270	0.157	0	0	0	0	1	0.364
<i>PE</i>	27270	0.419	0	0	1	0	1	0.493
<i>Block</i>	22632	0.395	0.378	0.263	0.517	0.00084	1	0.168
<i>Ins</i>	16933	25.82	19.16	4.153	43.67	0	67.54	23.68
<i>Bank</i>	27417	0.306	0	0	1	0	1	0.461

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Panel B 2006-2013

	N	Mean	Median	P25	P75	Min	Max	Sd. Dev
<i>FinAssets</i>	15995	869.4	289.6	99.94	678.9	0	118365	3454
<i>FinLiabilities</i>	15995	1415	218.0	32.40	819.9	0	184156	6126
<i>TREC_TA</i>	15990	0.163	0.139	0.0682	0.230	0	0.990	0.122
<i>OREC_TA</i>	15990	0.0241	0.0107	0.00448	0.0237	0	0.975	0.0484
<i>Nonoperating income</i>	15995	73.75	12.16	1.697	44.88	-1745	27691	417.0
<i>Fin expense</i>	12985	78.19	15.89	3.612	53.11	-4.535	8117	302.9
<i>netPPE</i>	15995	1882	379.3	136.1	1062	-122.6	425994	9989

**Table 2 Financial assets and financial liabilities for non-financial firms in China and US.**

This table reports results of panel regressions for samples of non-financial firms in China and US. The dependent variable is log ratio of financial assets to sales ratio (*logfinassets\_sales*); financial assets include cash holdings and short-term investments. *logfinlia\_sales* is log ratio of financial liabilities scaled by sales; Financial liabilities are the sum of short-term debt and long-term debt. *Size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets. Columns 1-4 present estimated results of Chinese firms and column 5 present results of US firms. The ratios of financial assets to sales and financial liabilities to sales are winsorized at 1% level. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variables: <i>log (finassets_sales)</i>					
	China				US
	(1)	(2)	(3)	(4)	(5)
<i>logfinlia_sales</i>	0.0478*** (0.00583)	0.0170*** (0.00575)	0.0168*** (0.00576)	0.0172*** (0.00587)	-0.0389*** (0.0056)
<i>Size</i>		0.339*** (0.0100)	0.338*** (0.0101)	0.338*** (0.0101)	0.00890*** (0.0026)
<i>Leverage</i>			-3.90E-05 (0.0008)	-1.13E-05 (0.0008)	0.0332*** (0.0087)
<i>ROA</i>				0.0202 (0.0594)	-0.00136*** (0.0003)
<i>Constant</i>	-2.884*** (0.4240)	-4.266*** (0.4150)	-4.263*** (0.4150)	-4.265*** (0.4150)	-3.373*** (0.0518)
Observations	24,183	24,183	24,174	24,174	50,811
R-squared	0.100	0.144	0.144	0.144	0.033
Number of Firms	2,253	2,253	2,253	2,253	4,263

**Table 3 The correlation between financial assets and financial liabilities in firms with different ownership nature.**

This table reports results of panel regressions over the sample period of 2006-2013. The dependent variable is log ratio of financial assets to sales ratio (*logfinassets\_sales*); financial assets include cash holdings and short-term investments. *logfinlia\_sales* is log ratio of financial liabilities scaled by sales; Financial liabilities is the sum of short-term debt and long-term debt. *Size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets. Columns 1-5 examine subsamples of local government owned enterprises, central government owned enterprises, private enterprises, widely-held enterprises and foreign enterprises. The ratios of financial assets to sales and financial liabilities to sales are winsorized at 1% level. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variables: <i>log (finassets_sales)</i>					
	(1)	(2)	(3)	(4)	(5)
	LocalSOE	CentralSOE	PE	Widely-held	FE
<i>logfinlia_sales</i>	0.0320** (0.0129)	0.158*** (0.0207)	-0.0640*** (0.0110)	0.147*** (0.0497)	0.0263 (0.0469)
<i>ROA</i>	-0.172 (0.1590)	-0.12 (0.2730)	-0.242*** (0.0774)	0.341 (0.3870)	0.109 (0.4680)
<i>size</i>	0.150*** (0.0273)	0.332*** (0.0385)	0.626*** (0.0214)	0.349*** (0.0808)	0.603*** (0.1040)
<i>leverage</i>	-0.363*** (0.0747)	-1.471*** (0.1480)	0.00258*** (0.0008)	-0.136 (0.1110)	-1.654*** (0.3010)
<i>Constant</i>	-2.652*** (0.2260)	-3.313*** (0.3200)	-5.768*** (0.1410)	-3.847*** (0.6390)	-5.058*** (0.8340)
Observations	4,041	1,909	6,509	427	447
R-squared	0.052	0.127	0.254	0.215	0.397
Number of ISIN	573	282	1,164	68	78

**Table 4 Financial assets and business fixed investments.**

This table presents results of panel data regressions where the dependent variable is financial assets (winsorized at 1%). Financial assets include cash holdings and short-term investments. *fixinvestment* is business fixed investments, which is equal to the increase (decrease) in net property, plant and equipment (winsorized at 1%). *Size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets. Column 1 reports results over the full sample period of 2006-2013; columns 2-4 report results of state-owned firm (including both local government owned firms and central government owned firms in table 3), private firms, and widely-held firms, respectively. Column 5 reports results of US firms. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variable: <i>financial assets</i>					
VARIABLES	China				US
	(1) Full sample	(2) SOE	(3) PE	(4) Widely-held	(5) Full sample
<i>fixinvestment</i>	0.105*** (0.0109)	0.0368** (0.0154)	0.240*** (0.0186)	-0.053 (0.0628)	-0.147*** (0.0194)
<i>ROA</i>	16.85*** (5.8580)	351.6*** (100.8000)	34.62*** (5.8830)	577.1*** (37.5387)	-2.674* (1.4510)
<i>size</i>	448.3*** (9.6840)	668.1*** (19.9100)	372.4*** (9.8230)	735.9*** (70.3100)	204.9*** (17.0700)
<i>leverage</i>	5.031*** (0.5480)	97.61* (58.6700)	3.766*** (0.3950)	327.9*** (75.0700)	0.644** (0.2720)
<i>Constant</i>	-2,837*** (68.78)	-4,583*** (158.30)	-2,260*** (65.25)	-5,073*** (538.20)	-577.2*** (114.80)
Observations	15,066	6,442	7,275	478	11,268
R-squared	0.302	0.313	0.384	0.361	0.042
Number of ISIN	2,303	870	1,207	70	1,769

**Table 5 Other receivables and financial liabilities.**

This table presents estimated results of panel regressions. Dependent variable in Panel A and columns 1-2 of Panel B is logarithm of other receivables to sales ratio; dependent variable in columns 3-5 of Panel B is *orec\_subtract*, which is defined as other receivables scaled by sales minus industry median ratio of other receivables to sales of US firms. *logfinlia\_sales* is logarithm of financial liabilities scaled by sales. Financial liabilities are the sum of short-term debt and long-term debt. *logtraderec\_sales* is logarithm of trade receivables to sales ratio; *size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets; *soe* is a dummy variable, indicating whether a firm is state-owned; *pe* is a dummy that equals 1 for private firms, else 0; *logfinlia\_sales\*soe* is *logfinlia\_sales* multiplied by *soe* dummy; *logfinlia\_sales\*pe* is *logfinlia\_sales* multiplied by *pe* dummy. Ratios of other receivables to sales, financial liabilities to sales, and trade receivables to sales are all winsorized at 1%. Column 1 in Panel A report results of full sample over 2006-2013; columns 2-4 examine subsample of state-owned firms, private firms, and widely-held firms; column 5 reports the results of US firms. Columns 1-2 in Panel B include the interaction terms of financial liabilities with *soe* duummy (*logfinlia\_sales\*soe*) and financial liabilities with *pe* dummy (*logfinlia\_sales\*pe*), respectively; columns 3-5 examine the correlation between *finlia\_sales* (financial liabilities divided by sales) and *orec\_subtract* in full sample and subsamples of state-owned firms and private firms, respectively. For brevity, Panel B doesn't tabulate the results of control variables: *size*, *ROA*, *leverage*, *logtraderec\_sales*, and *traderec\_sales*. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

**Table 5 Other receivables and financial liabilities continued.**

Panel A					
Dependent variable: <i>logrec_sales</i>					
VARIABLES	China			US	
	(1) Full sample	(2) SOE	(3) PE	(4) Widely-held	(5) Full sample
<i>logfinlia_sales</i>	0.154*** (0.0158)	0.153*** (0.0226)	0.145*** (0.0255)	0.283*** (0.0943)	0.116*** (0.0327)
<i>logtraderec_sales</i>	0.209*** (0.0218)	0.176*** (0.0322)	0.255*** (0.0360)	0.211*** (0.0703)	0.295*** (0.0500)
<i>logfreecashflow</i>	0.0128 (0.0109)	-0.00995 (0.0155)	0.0435** (0.0174)	-0.00637 (0.0609)	0.0273 (0.0280)
<i>size</i>	0.0718** (0.0340)	0.101** (0.0500)	0.0135 (0.0538)	0.408* (0.2080)	-0.142* (0.0818)
<i>ROA</i>	-1.096*** (0.1560)	-1.235*** (0.3480)	-1.127*** (0.1950)	1.781* (1.0100)	-1.497*** (0.3300)
<i>leverage</i>	0.310*** (0.0627)	0.371** (0.1560)	0.288*** (0.0794)	0.409 (0.2490)	-0.512** (0.2190)
<i>Constant</i>	-4.073*** (0.2770)	-4.066*** (0.4270)	-4.000*** (0.4090)	-6.533*** (1.5330)	-2.134*** (0.6660)
Observations	7,488	3,455	3,342	242	2,910
R-squared	0.102	0.106	0.11	0.184	0.038
Number of ISIN	2,148	833	1,104	66	625

Panel B					
Dependent variable	<i>logrec_sales</i>			<i>orec_substract</i>	
	(1) Full sample	(2) Full sample	(3) Full sample	(4) SOE	(5) PE
<i>logfinlia_sales</i>	0.142*** (0.0137)	0.179*** (0.0142)			
<i>logfinlia_sales_soe</i>	0.0438** (0.0200)				
<i>logfinlia_sales_pe</i>		-0.0373* (0.0199)			
<i>finlia_sales</i>			1.508*** (0.2210)	0.332*** (0.0378)	0.41 (0.3460)



**Table 6 Non-operating income, finance expenses and other receivables.**

This table presents estimates of panel regressions where the dependent variable is log ratio of non-operating income (*logNon-operatingIncome*) in Panel A and log ratio of interest and related expenses (*logfinexp*) in Panel B over the period of 2006-2013. *logorec\_sales* is log of other receivables to sales ratio; *size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets; *soe* is a dummy variable, indicating whether a firm is state-owned; *pe* is a dummy that equals 1 for private firms, else 0. Column 1-3 in Panel A and B report the results of full sample, where we include interaction terms of *logorec\_sales* with *soe* dummy (*logorec\_sales\*soe*) and *logorec\_sales* with *pe* dummy (*logorec\_sales\*pe*) in columns 2-3, respectively. The samples in columns 4 and column 5 of Panel A and Panel B are state-owned firms and private firms. Firm and year fixed effects are included in all regressions, except for column 1-4 which add year fixed effects. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Panel A					
Dependent variable: <i>log (Non-operating Income)</i>					
	(1)	(2)	(3)	(4)	(5)
	Full sample	Full sample	Full sample	SOE	PE
<i>logorec_sales</i>	0.154*** (0.0109)	0.140*** (0.0135)	0.171*** (0.0160)	0.176*** (0.0173)	0.144*** (0.0151)
<i>logorec_sales*soe</i>		0.0405* (0.0222)			
<i>logorec_sales*pe</i>			-0.0306 (0.0214)		
<i>size</i>	0.879*** (0.0227)	0.878*** (0.0227)	0.878*** (0.0227)	0.644*** (0.0380)	0.968*** (0.0315)
<i>ROA</i>	1.688*** (0.0873)	1.681*** (0.0874)	1.687*** (0.0873)	3.088*** (0.2070)	1.784*** (0.1290)
<i>leverage</i>	0.00829 (0.0103)	0.00901 (0.0103)	0.00866 (0.0103)	0.307** (0.1220)	0.00834 (0.0116)
<i>Constant</i>	-3.832*** -0.166	-3.819*** -0.166	-3.820*** -0.166	-1.952*** -0.313	-4.646*** -0.213
Observations	13,126	13,126	13,126	5,344	6,609
R-squared	0.345	0.345	0.345	0.294	0.399
Number of ISIN	2,294	2,294	2,294	868	1,201

**Table 6 Non-operating income, finance expenses and other receivables, continued**

Panel B					
Dependent variable: $\log(finexp)$					
	(1)	(2)	(3)	(4)	(5)
	Full sample	Full sample	Full sample	SOE	PE
<i>logorec_sales</i>	-0.0367*** (0.0079)	-0.0376*** (0.0100)	-0.0316*** (0.0111)	-0.0364*** (0.0115)	-0.0456*** (0.0116)
<i>logorec_sales*soe</i>		0.00216 (0.0155)			
<i>logorec_sales*pe</i>			-0.01 (0.0152)		
<i>logfinlia_sales</i>	0.464*** (0.0091)	0.464*** (0.0091)	0.464*** (0.0091)	0.405*** (0.0134)	0.462*** (0.0137)
<i>size</i>	0.630*** (0.0171)	0.630*** (0.0171)	0.630*** (0.0171)	0.819*** (0.0261)	0.597*** (0.0254)
<i>ROA</i>	-0.234*** (0.0848)	-0.235*** (0.0849)	-0.235*** (0.0849)	0.293* (0.1650)	-0.167 (0.1080)
<i>leverage</i>	0.00570*** (0.0008)	0.00570*** (0.0008)	0.00569*** (0.0008)	0.924*** (0.0758)	0.00528*** (0.0008)
<i>Constant</i>	-1.552*** (0.1270)	-1.551*** (0.1270)	-1.548*** (0.1270)	-3.371*** (0.2250)	-1.531*** (0.1730)
Observations	11,784	11,784	11,784	5,146	5,588
R-squared	0.399	0.399	0.399	0.49	0.356
Number of ISIN	2,190	2,190	2,190	844	1,130

**Table 7 Tight monetary policies and re-lending business.**

This table reports the estimated results of panel data (quarterly) regressions over the period of 2007-2013 where the dependent variable is log ratio of financial assets scaled by sales (*logfinassets\_sales*). Monetary policy indicators include deposit reserve ratio, M2 and Shanghai interbank offered rate (SHIBOR); the data is provided by People's Bank of China. Correspondingly, we have three tight monetary policy indicators: *tight*, *M2tight*, and *shibortight*. *Tight* equals 1 if PBC increases deposit reserve ratio, else 0; *M2tight* equals 1 if the growth rate of M2 decreases, else 0; *shibortight* equals 1 if SHIBOR increases, else 0. *logfinlia\_sales* is logarithm of financial liabilities scaled by sales; *soe* is a dummy variable, indicating whether a firm is state-owned; *pe* is a dummy that equals 1 for private firms, else 0. *logfinlia\_sales\_tight*, *logfinlia\_sales\_M2tight* and *logfinlia\_sales\_shibortight* are interaction terms of *logfinlia\_sales* with *tight*, *M2tight*, and *shibortight*; *logfinlia\_tight\_soe* equals *logfinlia\_sales\_tight* multiplied by *soe* dummy; *logfinlia\_tight\_pe* equals *logfinlia\_sales\_tight* multiplied by *pe* dummy. *logfina\_sales*, *logfinlia\_sales* and *logorec\_sales* are winsorized at 1% level. The estimation in Panel A apply full sample data. Columns 1, 3, 5 in Panel B examine the subsample of state-owned firms in which the monetary policy indicators are deposit reserve ratio, M2 and SHIBOR, respectively; columns 2, 4, 6 examine the effects of tight monetary policies in the subsample of private firms. Panel C also examine the full sample but include the interaction terms of financial liabilities with tight monetary policy indicators as well as *soe* (*pe*) dummy. For brevity, we don't show the results of other control variables: *size*, *ROA*, and *leverage*. Firm and quarter fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

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Dependent variable: *logfinassets\_sales*

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)
<i>logfinlia_sales</i>	0.170*** (0.0041)	0.180*** (0.0044)	0.170*** (0.0041)	0.177*** (0.0048)	0.170*** (0.0041)	0.175*** (0.0046)
<i>tight</i>	0.223*** (0.0246)	0.229*** (0.0246)				
<i>logfinlia_sales_tight</i>		-0.0262*** (0.0044)				
<i>shibortight</i>			0.151*** (0.0244)	0.152*** (0.0244)		
<i>logfinlia_sales_shibortight</i>				-0.0121*** (0.0042)		
<i>M2tight</i>					0.223*** (0.0246)	0.224*** (0.0246)
<i>logfinlia_sales_M2tight</i>						-0.0106** (0.0041)

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**Table 7 Tight monetary policies and re-lending business, continued.**

Panel B						
	(1)	(2)	(3)	(4)	(5)	(6)
	SOE	PE	SOE	PE	SOE	PE
<i>logfinlia_sales</i>	0.198*** (0.0061)	0.152*** (0.0074)	0.200*** (0.0064)	0.144*** (0.0081)	0.197*** (0.0062)	0.144*** (0.0077)
<i>tight</i>	0.0711** (0.0326)	0.394*** (0.0448)				
<i>logfinlia_sales_tight</i>	-0.00951* (0.0057)	-0.0431*** (0.0081)				
<i>shibortight</i>			0.0215 (0.0324)	0.275*** (0.0445)		
<i>logfinlia_sales_shibortight</i>			-0.00912* (0.0055)	-0.0137* (0.0074)		
<i>M2tight</i>					0.0699** (0.0326)	0.386*** (0.0448)
<i>logfinlia_sales_M2tight</i>					-0.00465 (0.0055)	-0.0173** (0.0073)

Panel C			
	(1)	(2)	(3)
<i>logfinlia_sales</i>	0.181*** (0.0044)	0.181*** (0.0044)	0.181*** (0.0044)
<i>tight</i>	0.228*** (0.0246)	0.228*** (0.0246)	0.228*** (0.0246)
<i>logfinlia_sales_tight</i>	-0.0472*** (0.0061)	-0.00979* (0.0054)	-0.0217* (0.0118)
<i>logfinlia_tight_soe</i>	0.0404*** (0.0081)		0.0147 (0.0130)
<i>logfinlia_tight_pe</i>		-0.0461*** (0.0085)	-0.0342** (0.0135)



**Table 9 Financial crisis and re-lending business.**

This table reports the estimated results of panel data (quarterly) regressions over the period of 2007-2013 where the dependent variable is log ratio of financial assets to sales (*logfinassets\_sales*). *crisis* is a dummy which equals 1 for period 2008 Q4 to 2010 Q4. *logfinlia\_sales* is logarithm of financial liabilities scaled by sales; *soe* is a dummy variable, indicating whether a firm is state-owned; *pe* is a dummy that equals 1 for private firms, else 0; *size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets; *logfinlia\_crisis* is defined as *logfinlia\_sales* multiplied by *crisis* dummy; *logfinlia\_crisis\_soe* equals *logfinlia\_crisis* multiplied by *soe* dummy; *logfinlia\_crisis\_pe* equals *logfinlia\_crisis* multiplied by *pe* dummy. Columns 1-2 report results of full sample; columns 3-4 examine subsamples of state-owned firms and private firms.; columns 5-6 include interaction terms of log ratio of scaled financial liabilities with *crisis* dummy and *soe* (*pe*) dummy into full sample. *logfina\_sales* and *logfinlia\_sales* are winsorized at 1% level. Firm and quarter fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variable: <i>logfinassets_sales</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
	Full sample	Full sample	SOE	PE	Full sample	Full sample
<i>logfinlia_sales</i>	0.170*** (0.0041)	0.180*** (0.0043)	0.201*** (0.0060)	0.149*** (0.0071)	0.180*** (0.0043)	0.180*** (0.0043)
<i>crisis</i>	0.122*** (0.0242)	0.120*** (0.0242)	0.128*** (0.0314)	0.145*** (0.0449)	0.119*** (0.0242)	0.118*** (0.0242)
<i>logfinlia_crisis</i>		-0.0320*** (0.0047)	-0.0196*** (0.0060)	-0.0537*** (0.0089)	-0.0533*** (0.0068)	-0.0153*** (0.0056)
<i>logfinlia_crisis_soe</i>					0.0390*** (0.0089)	
<i>logfinlia_crisis_pe</i>						-0.0510*** (0.0094)
<i>size</i>	0.226*** (0.0092)	0.226*** (0.0092)	0.136*** (0.0127)	0.321*** (0.0149)	0.226*** (0.0092)	0.226*** (0.0092)
<i>ROA</i>	-0.00108*** (0.0003)	-0.00109*** (0.0003)	-0.00381 (0.0029)	-0.00108*** (0.0003)	-0.00110*** (0.0003)	-0.00111*** (0.0003)
<i>leverage</i>	-0.0149*** (0.0024)	-0.0148*** (0.0024)	-0.0289*** (0.0044)	-0.00505* (0.0030)	-0.0149*** (0.0024)	-0.0149*** (0.0024)
<i>Constant</i>	-1.986*** (0.0715)	-1.990*** (0.0715)	-1.512*** (0.1020)	-2.349*** (0.1090)	-1.987*** (0.0715)	-1.985*** (0.0715)
Observations	43,942	43,942	20,421	17,956	43,942	43,942
R-squared	0.086	0.087	0.095	0.092	0.088	0.088
Number of company	2,322	2,322	867	1,140	2,322	2,322

**Table 10 Growth opportunity and re-lending business.**

This table presents estimated results of panel regressions over the period of 2006-2013 where the dependent variable is other receivables scaled by total assets (*orec\_ta*). We include four measures of growth opportunity in this table: ROA with one-year lag (*lagged\_ROA*), P/E ratio (*PEratio*), growth rate of total assets (*growth*), and profit growth (*profitgrowth*). *PEratio* equals a stock's price divided by the company's after tax earnings over the 12-month period. *size* is log ratio of total assets; *leverage* is liabilities divided by assets; *traderec\_ta* is trade receivables scaled by total assets. Columns 1-5 report results of full sample; columns 6 and column 7 examine subsamples of state-owned firms and private firms, respectively. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variable: <i>orec_ta</i>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full sample	Full sample	Full sample	Full sample	Full sample	SOE	PE
<i>lagged_ROA</i>	-0.0105*** (0.00243)				-0.0105*** (0.00256)	0.00867 (0.00570)	-0.0435*** (0.00369)
<i>PEratio</i>		-1.61e-06*** (0.00000)			-1.38e-06*** (0.00000)	-2.88e-06*** (0.00000)	1.12E-06 (0.00000)
<i>growth</i>			-2.32e-05*** (0.00001)		-1.98e-05*** (0.00001)	6.70E-06 (0.00001)	-2.69e-05** (0.00001)
<i>profitgrowth</i>				9.09E-08 (0.00000)	7.63E-08 (0.00000)	4.79E-08 (0.00000)	3.15E-07 (0.00000)
<i>size</i>	-0.00893*** (0.00071)	-0.00762*** (0.00084)	-0.00675*** (0.00070)	-0.00681*** (0.00068)	-0.00779*** (0.00091)	-0.00620*** (0.00111)	-0.0105*** (0.00149)
<i>leverage</i>	0.000667*** (0.00004)	0.000665*** (0.00004)	0.000668*** (0.00004)	0.000675*** (0.00004)	0.000673*** (0.00004)	0.0336*** (0.00292)	0.000657*** (0.00005)
<i>traderec_ta</i>	-0.0155** (0.00666)	-0.00818 (0.00800)	-0.00957 (0.00636)	-0.0099 (0.00617)	-0.00639 (0.00865)	0.000811 (0.01030)	-0.0277** (0.01390)
<i>Constant</i>	0.105*** (0.00525)	0.0948*** (0.00624)	0.0858*** (0.00518)	0.0861*** (0.00503)	0.0972*** (0.00672)	0.0616*** (0.00881)	0.130*** (0.01050)
Observations	14,402	13,105	15,060	15,451	11,957	5,853	5,129
R-squared	0.088	0.068	0.07	0.069	0.076	0.068	0.154
Number of ISIN	2,303	2,266	2,303	2,303	2,250	870	1,194

**Table 11 Corporate governance and re-lending business.**

This table presents estimated results of panel regressions where dependent variable is other receivables scaled by total assets (*orec\_ta*) over the period of 2006-2013. *Block* is percentage of shares held by the largest shareholder; *Herfindahl\_10* measures concentration of shareholdings, equal to the sum square of percentage of shares held by top 10 largest shareholders; *chairmanCEO* equals to 1 if CEO is the chairman or a vice chairman of the board of directors and equals 2 if not; *shareratioofdirector* is the percentage of shares held by directors; *ratio\_nonpaidDIR* is number of non-paid directors divided by number of directors; *size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets; *traderec\_ta* is trade receivables scaled by total assets. Columns 1-6 report results of full sample; columns 7 and column 8 examine subsamples of state-owned firms and private firms separately. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variable: <i>orec_ta</i>								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full sample	Full sample	Full sample	Full sample	Full sample	Full sample	SOE	PE
<i>Block</i>	-0.0488*** (0.0063)					-0.02 (0.0155)	-0.0387* (0.0220)	-0.00105 (0.0220)
<i>Herfindahl_10</i>		-0.0641*** (0.0082)				-0.0179 (0.0197)	0.0406 (0.0268)	-0.0716** (0.0288)
<i>shareratioofdirector</i>			-0.0332*** (0.0105)			-0.0281*** (0.0103)	-0.124** (0.0547)	-0.0317*** (0.0110)
<i>chairmanCEO</i>				-0.00299** (0.0015)		-0.00263* (0.0015)	-0.000119 (0.0022)	-0.00179 (0.0020)
<i>ratio_nonpaidDIR</i>					-0.0110*** (0.0035)	-0.0113*** (0.0036)	-0.0130*** (0.0043)	-0.00944 (0.0062)
<i>size</i>	-0.00487*** (0.0008)	-0.00421*** (0.0009)	-0.00686*** (0.0008)	-0.00602*** (0.0008)	-0.00671*** (0.0008)	-0.00451*** (0.0009)	-0.00463*** (0.0012)	-0.00371*** (0.0014)
<i>ROA</i>	0.00660*** (0.0004)	0.00663*** (0.0004)	0.00680*** (0.0004)	0.00624*** (0.0004)	0.00665*** (0.0004)	0.00631*** (0.0004)	-0.0300*** (0.0060)	0.0114*** (0.0006)
<i>leverage</i>	0.000762*** (0.0000)	0.000769*** (0.0000)	0.000758*** (0.0000)	0.000711*** (0.0000)	0.000757*** (0.0000)	0.000715*** (0.0000)	0.0314*** (0.0035)	0.000737*** (0.0000)
<i>traderec_ta</i>	-0.00847 (0.0074)	-0.0116 (0.0077)	-0.0148* (0.0077)	-0.01 (0.0074)	-0.0112 (0.0077)	-0.0139* (0.0076)	-0.0151 (0.0102)	-0.0301*** (0.0109)
<i>Constant</i>	0.0924*** (0.0060)	0.0814*** (0.0061)	0.0923*** (0.0062)	0.0858*** (0.0064)	0.0901*** (0.0062)	0.0907*** (0.0075)	0.0658*** (0.0108)	0.0973*** (0.0114)
Observations	13,512	13,325	12,575	12,971	13,174	12,127	5,530	5,528
R-squared	0.091	0.091	0.097	0.081	0.087	0.092	0.069	0.2
Number of ISIN	2,303	2,302	2,302	2,302	2,302	2,302	870	1,207



**Table 12 External finance dependence and credit constraints in re-lending business.**

This table presents estimated results of panel regressions where dependent variable is other receivables scaled by total assets (*orec\_ta*) over sample period of 2006-2013. EFdependence is calculated as capital expenditure minus the sum of cash flow from operations plus decrease in inventories and increase in payables divided by capital expenditure; Inven equals the ratio of inventories to sales; Tangibility is the proportion of net plant, property and equipment in total book-value assets; TrCredit is defined as the change in accounts payable divided by the change in total assets. The calculation of these measures utilizes the data from North America Compustat database for all U.S. firms and is based on year-by-year industry median, and thus four variables are included in this table: *m\_EFdependence*, *m\_Inven*, *m\_Tangi*, and *m\_TrCredit*. *size* is log ratio of total assets; *ROA* is return on assets; *leverage* is liabilities divided by assets; *traderec\_ta* is trade receivables scaled by total assets. Columns 1-5 report results of full sample; columns 6 and column 7 examine subsamples of state-owned firms and private firms, respectively. Firm and year fixed effects are included in all regressions. \*\*\*, \*\*, and \* represent statistical significance at 1%, 5% and 10% levels, respectively.

Dependent variable: <i>orec_ta</i>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full sample	Full sample	Full sample	Full sample	Full sample	SOE	PE
<i>m_EFdependence</i>	-4.58e-05** (0.00002)				-4.61e-05** (0.00002)	-3.80E-05 (0.00003)	-5.21e-05** (0.00003)
<i>m_Tangi</i>		0.00414 (0.00769)			0.00121 (0.00782)	0.00476 (0.01000)	-0.00857 (0.01230)
<i>m_Inven</i>			0.00953 (0.00670)		0.00752 (0.00680)	0.0165 (0.01100)	0.00515 (0.00912)
<i>m_TrCredit</i>				6.85e-05*** (0.00003)	6.91e-05*** (0.00003)	-1.12E-05 (0.00003)	0.000148*** (0.00004)
<i>size</i>	-0.00751*** (0.00067)	-0.00749*** (0.00067)	-0.00742*** (0.00067)	-0.00749*** (0.00067)	-0.00741*** (0.00067)	-0.00479*** (0.00104)	-0.00860*** (0.00101)
<i>leverage</i>	-0.000430* (0.00026)	-0.000429* (0.00026)	-0.000424* (0.00026)	-0.000433* (0.00026)	-0.000426* (0.00026)	0.0267*** (0.00312)	0.000617 (0.00103)
<i>ROA</i>	-0.000976 (0.00070)	-0.000973 (0.00070)	-0.000969 (0.00070)	-0.000983 (0.00070)	-0.000973 (0.00070)	-0.0316*** (0.00541)	-0.0172*** (0.00376)
<i>traderec_ta</i>	-0.0118** (0.00596)	-0.0119** (0.00596)	-0.0116* (0.00596)	-0.0117** (0.00596)	-0.0115* (0.00596)	-0.00582 (0.00999)	-0.0220*** (0.00781)
<i>Constant</i>	0.0943*** (0.00491)	0.0932*** (0.00527)	0.0926*** (0.00499)	0.0941*** (0.00491)	0.0924*** (0.00532)	0.0537*** (0.00899)	0.111*** (0.00765)
Observations	15,458	15,470	15,467	15,462	15,457	6,301	7,724
R-squared	0.06	0.059	0.059	0.06	0.06	0.068	0.099
Number of ISIN	2,246	2,246	2,246	2,246	2,246	843	1,178

**Table 13 medians of factors in state-owned firms and private firms.**

This table presents median values of all determinants examined in section 6 in the subsamples of state-owned firms and private firms. *PEratio* equals a stock's price divided by the company's after tax earnings over the 12-month period; *lagged\_ROA* is ROA with one-year lag; *growth* is the growth rate of total assets; *Block* is percentage of shares held by the largest shareholder; *Herfindahl\_10* measures concentration of shareholdings, equal to the sum square of percentage of shares held by top 10 largest shareholders; *chairmanCEO* equals to 1 if CEO is the chairman or a vice chairman of the board of directors and equals 2 if not; *shareratioofdirector* is the percentage of shares held by directors; *ratio\_nonpaidDIR* is number of non-paid directors divided by number of directors; *m\_EFdependence* is US industry median of the value that calculated as capital expenditure minus the sum of cash flow from operations plus decrease in inventories and increase in payables divided by capital expenditure; *m\_Inven* equals the US industry median ratio of inventories to sales; *m\_Tangi* is US industry median of the proportion of net plant, property and equipment in total book-value assets; *m\_TrCredit* is US industry median of the change in accounts payable divided by the change in total assets. According to Wilcoxon rank-sum tests, medians of all these variables are significantly different between these two subsamples, except *chairmanCEO*.

Factors	SOE	PE
<i>PEratio</i>	39.03	42.1
<i>ROA</i>	0.0357	0.0707
<i>growth</i>	0.106	0.167
<i>profitgrowth</i>	13.45	20.12
<i>Block</i>	0.392	0.31
<i>Herfindahl_10</i>	0.169	0.126
<i>chairmanCEO</i>	2	2
<i>shareratioofdirector</i>	1.72e-06	0.0468
<i>ratio_nonpaidDIR</i>	0.333	0.125
<i>m_EFdependence</i>	-0.220	-0.425
<i>m_Tangi</i>	0.243	0.171
<i>m_Inven</i>	0.119	0.126
<i>m_TrCredit</i>	0.0410	0.0494

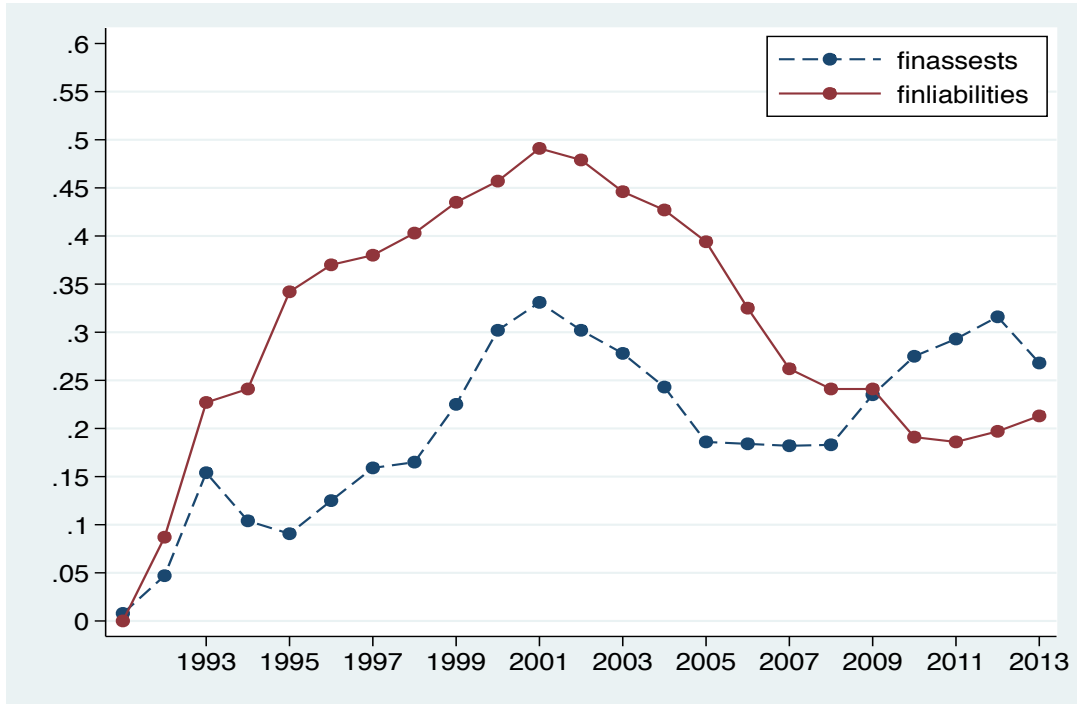


Figure 1 The trends of financial assets and financial liabilities. This figure plots the variations of financial assets scaled by sales and financial liabilities scaled by sales over the sample period 1990-2013. Financial assets include cash and short-term investments, and financial liabilities are sum of short-term debts and long-term debts.

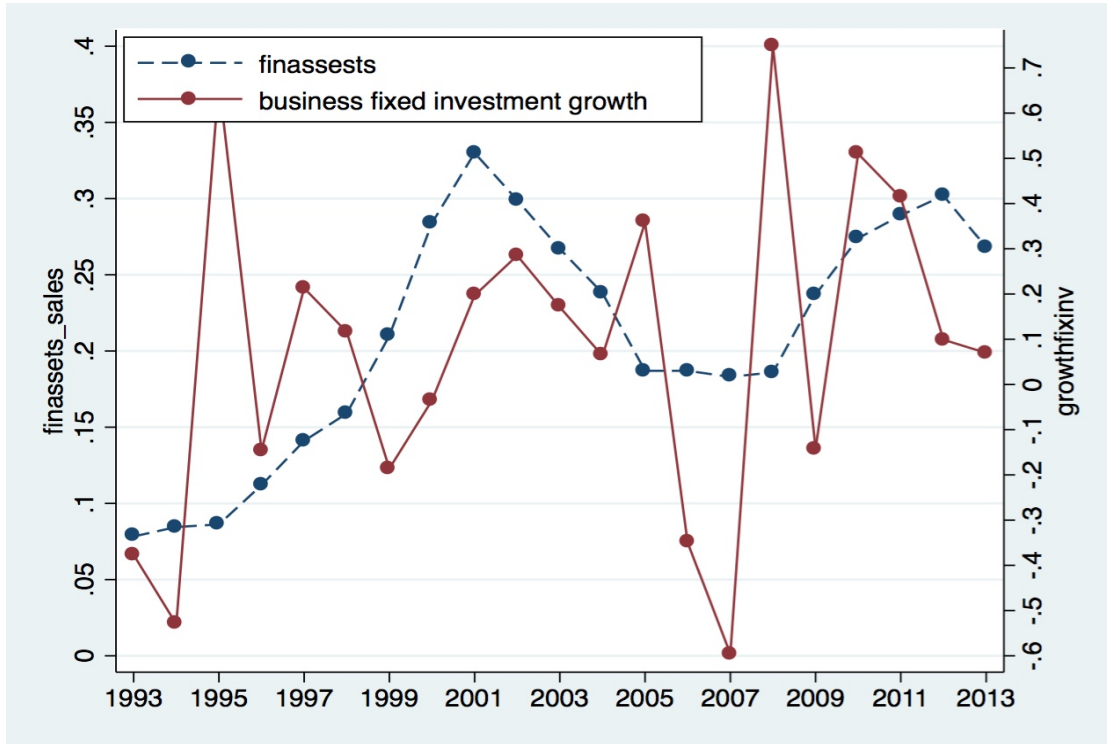


Figure 2 Trends of scaled financial assets and growth of business fixed investments over 1990-2013. Financial assets include cash holdings and short-term investments; business fixed investments is the increase (decrease) in the item of net property, plant and equipment.

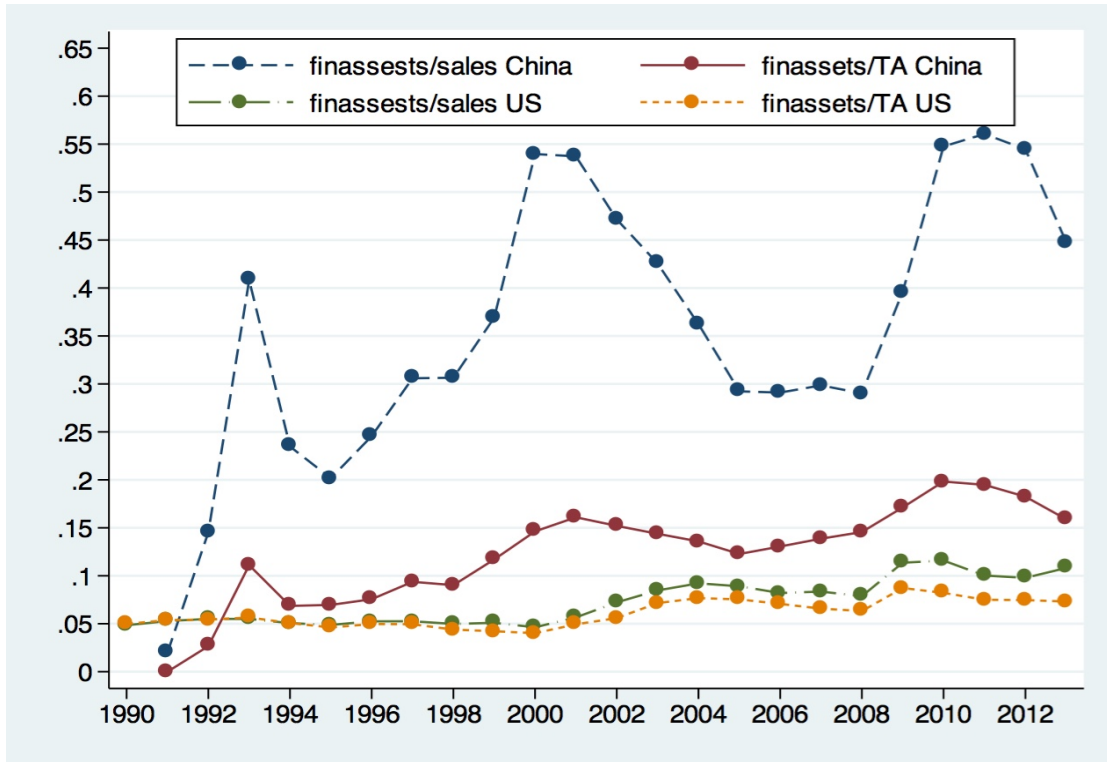


Figure 3 The comparison of cash holdings in Chinese firms and US firms. This figure plots median ratio of financial assets to aggregate sales and median ratio of financial assets to total assets for Chinese firms and US firms. Financial assets include cash holdings and short-term investments. TA is total assets of firms.

## Appendix A

### Pecking order theory tests for Chinese firms

A strand of literatures has tested the validity of pecking order theory in China (Ni and Yu, 2008; Tong and Green, 2005; Huang and Song, 2006). Usually the focus of these papers is on the capital structure and financing patterns, and alternative theory is trade-off hypothesis. Pecking order theory is proposed by Myer and Majluf (1984) based on asymmetric information, suggesting that there is no optimal debt ratio and firms prefer internal financing to external financing, debt preferred to equity when external funds are necessary. In contrast, trade-off theory requires firms to tradeoff benefits and costs of debts and suggests that similar firms should have close debt ratios.

In this paper, we use the unusual positive correlation between financial assets and financial liabilities and non-negative correlation between business fixed investments and financial assets to clarify the existence of re-lending business, and one prerequisite is that firms should use internal funds when they finance investments. This assumption partly conforms to the prediction of pecking order theory: firms only tap external funds when internal funds are insufficient. But we don't require Chinese firms to follow the financing pattern of pecking order theory and what we only need is internal funds are used (either partly or nearly all as pecking order theory predicts) when firms disburse real investments. Also we don't care about the preference between debt and equity.

For more convincingness, we still test the pecking order theory among Chinese firms in the appendix. In previous literatures, there are two directions for test: one is basic test, based on financial deficits are directly linked with debt and leverage; the other one focuses on determinants of capital structure. Here we repeat these two methods to specify that Chinese firms do not violate pecking order theory after 2000. The basic method is to test the following hypothesis:

$$\Delta D = \alpha + \beta DEF + \varepsilon;$$

$$\text{where } DEF = DIV + X + \Delta W - C$$

Here,  $\Delta D$  is change in outstanding long-term debt in Shyam-Sunder and Myer's model. But Ni and Yu (2008) suggest that Chinese firms prefer short-term debt as the main tool for financing, and thus we follow their instructions, applying change in total liabilities as  $\Delta D$ .  $DEF$  is fund deficit of each firm;  $DIV$  is cash dividends,  $X$  is capital expenditure,  $\Delta W$  is change in working capitals, and  $C$  is operating cash flows.

According to pecking order theory, the coefficient  $\beta$  should be equal to 1 since one-dollar fund deficit induce one-dollar increase in debt.

Table A present the test results. We observe that over the whole sample period 1990-2013 the coefficients of fund deficit are 0.322 at 1% significance level. Then we run analogous regressions over different sub-periods year by year, and find that 2000 is a critical. Before 2000, the correlation between fund deficit and liabilities are significantly negative, suggesting an obvious violation of pecking order theory; but after 2000, fund deficits keep a co-movement with change in liabilities. Although the coefficient is not equal to 1, it's still significantly positive and we cannot reject the zero hypothesis. After all, the requirement of 1 is the strictest form of pecking order theory; in reality, it's impossible for firms to draw external fund all from way of debt financing.

Thus the results show that Chinese firms do not violate predictions of pecking order theory after 2000. This conclusion is consistent with Huang and Tong (2006) over the period of 1994-2003 and Tong and Green (2007) over 2001-2003. Meanwhile, Ni and Yu (2008) find that larger firms follow pecking order theory but smaller firms do not.

Table A

Dependent variable: delta_liabilities			
	1990-2013	1990-1999	2000-2013
DEF	0.322*** (0.00764)	-0.479*** (0.045)	0.319*** (0.00795)
Observations	24,730	1,748	22,982
R-squared	0.074	0.124	0.073
Number of firms	2,545	948	2,545

Table B

Dependent variable: leverage						
	1990-2013	1990-1999	2000-2013	2000-2005	2006-2008	2009-2013
ROA	-8.363*** (0.5550)	-0.495*** (0.0711)	-1.043*** (0.0006)	-1.337*** (0.0621)	-0.554*** (0.0078)	-0.0274** (0.0134)
lnsales	-0.371*** (0.0946)	0.0109 (0.0101)	-0.01 (0.0064)	-0.0299* (0.0163)	-0.00908 (0.0181)	-0.0504*** (0.0049)
growth	- 0.00278** (0.0011)	-0.0309*** (0.0082)	0.000167** (0.0001)	-0.026 (0.0182)	-0.248*** (0.0040)	-3.78E-05 (0.0000)
lncashdiv	-0.0478 (0.0565)	-0.00726* (0.0037)	-0.0101*** (0.0036)	-0.0469*** (0.0093)	-0.0131* (0.0077)	0.00460** (0.0020)
Constant	3.933 3.2220	0.438*** (0.0950)	0.527*** (0.0379)	0.863*** (0.0976)	1.154*** (0.1190)	0.830*** (0.0323)
Observations	22,026	1,679	22,195	7,159	4,807	10,229
R-squared	0.016	0.096	0.994	0.109	0.999	0.04
Number of firms	2,301	928	2,534	1,514	1,924	2,445

Then we test pecking order theory from determinants of capital structure. We include some classical determinants into regressions: ROA, size (log ratio of sales), growth (growth rate of total assets) and cash dividends. According to predictions of pecking order theory, ROA, size, growth and cash dividends should have a negative, negative, positive and positive sign correspondingly. We divide full sample into different subgroups: 2000 is the critical for basic tests of pecking order theory, 2006 is the ending year for related loans and after 2009 the crisis has less impact and inter-corporate loans have more freedom. We could observe that most signs are consistent with expectation: profitability has a negative relationship with leverage; larger size induces more asymmetric information and more difficulty in obtaining external funds. But it's noted that cash dividends are only significantly positively correlated with

leverage over 2009-2013. It's nature that more cash payments for dividends lead to more fund deficits, and then more leverage; the negative relationship between cash dividends and leverage before 2009 is confusing.

Combing all the test results together, we still could conclude that non-financial firms in China do not violate pecking order theory, and especially evidence strongly supports pecking order hypothesis after 2009, the most important period during which we examine the re-lending business between firms.



## Appendix B Definitions of variables

Variables	Definitions
Financial assets	Cash holdings and short-term investments
Financial liabilities	Short-term debts + long-term debts
Business fixed investments	Increase (decrease) in net property, plant and equipment
Size	Log ratio of total assets
Growth	Growth rate of total assets
Leverage	Liabilities/Total assets
Block	Percentage of shares held by the largest shareholders
Public enterprises (pub e) <sup>1</sup>	No actual controllers
Local SOE	Actual controllers are local governments.
Central SOE	Actual controllers are central governments.
Private firms (pe)	Actual controllers are individuals.
Foreign firms (fe)	Actual controllers are foreign entities.
Tight	Dummy variable, increasing deposit reserve ratio is 1, else 0.
M2tight	Dummy variable, if the growth rate of M2 decrease, it's equal to 1, else 0.
Shibortight	Dummy variable, it's equal to 1 if 30 day weighted Shanghai interbank offer rate increases, else 0.
PE ratio	Price/earnings
MB ratio	Market value/Book value
Institute (ins)	Percentage of shares held by institutional investors
EFdependence	(Capital expenditure - cash flow from operations - decrease in inventories - increase in payables) / capital expenditure
Inventory (inven)	Inventories/sales
Tangibility	Tangible assets with the share of net plant, property and equipment / total book-value assets
TrCredit	Increase (decrease) in account payables / increase (decrease) in total assets

<sup>1</sup> The expressions in parentheses are abbreviations used in main text.