

# THE EFFECT OF PROPERTY RIGHTS PROTECTION ON CAPITAL STRUCTURE: EVIDENCE FROM A CHINESE NATURAL EXPERIMENT

**Yixin Liu**

University of New Hampshire

([yixin.liu@unh.edu](mailto:yixin.liu@unh.edu))

**Yu Liu**

University of Texas at Rio Grande Valley

([yu.liu@utrgv.edu](mailto:yu.liu@utrgv.edu))

**William L. Megginson**

University of Oklahoma

([wmegginson@ou.edu](mailto:wmegginson@ou.edu))

**Zuobao Wei**

University of Texas at El Paso

([zwei@utep.edu](mailto:zwei@utep.edu))

June 15, 2019

## Abstract

We examine how changes in property rights security impact firm capital structure decisions by exploiting a natural experiment, the enactment of China's Property Rights Law in 2007 (the Law). Using a large dataset of China's non-listed firms, we document a significant decrease in leverage after the Law's passage. This finding is consistent with the "reinvestment hypothesis" which stipulates that as property rights protection strengthens, firms are willing to reinvest more of their profits, thus leading to less use of external debts (Johnson, McMillan and Woodruff, *American Economic Review*, 2002). These results also hold when we examine listed Chinese firms and when we account for potentially confounding events occurring after the Law's passage. In subsample analyses of the unlisted firms, we find that financially constrained firms experience an increase in leverage relative to unconstrained ones following the Law's enactment. In subsample analyses of the listed firms, we find that financial constraint plays an insignificant role in the property rights – leverage relation.

JEL Classification: K11 G32 G38

Keywords: China; Property rights protection; Capital structure; Leverage

Please address correspondence to:

**William L. Megginson**

Price College of Business

307 West Brooks, 205A Adams Hall

The University of Oklahoma

Norman, OK 73019-4005

Tel: (405) 325-2058; Fax: (405) 325-7688

E-mail: [wmegginson@ou.edu](mailto:wmegginson@ou.edu)

# **The Effect of Property Rights Protection on Capital Structure: Evidence from a Chinese Natural Experiment**

## **Abstract**

We examine how changes in property rights security impact firm capital structure decisions by exploiting a natural experiment, the enactment of China's Property Rights Law in 2007 (the Law). Using a large dataset of China's non-listed firms, we document a significant decrease in leverage after the Law's passage. This finding is consistent with the "reinvestment hypothesis" which stipulates that as property rights protection strengthens, firms are willing to reinvest more of their profits, thus leading to less use of external debts (Johnson, McMillan and Woodruff, *American Economic Review*, 2002). These results also hold when we examine listed Chinese firms and when we account for potentially confounding events occurring after the Law's passage. In subsample analyses of the unlisted firms, we find that financially constrained firms experience an increase in leverage relative to unconstrained ones following the Law's enactment. In subsample analyses of the listed firms, we find that financial constraint plays an insignificant role in the property rights – leverage relation.

Keywords: China; Property rights protection; Capital structure; Leverage

JEL Code: K11 G32 G38

June 15, 2019

# The Effect of Property Rights Protection on Capital Structure: Evidence from a Chinese Natural Experiment

## 1. Introduction

The effect of secure property rights has been examined extensively in the literature. Recent studies investigating property rights protection at the country level show that poor protection can lead to lower investments, slower economic growth, and negative stock market reactions (Knack and Keefer, 1995; Acemglu et al., 2001; Claessens and Laeven, 2003; Girardi and Bowles, 2018). Other recent studies focus on firm level policies and report a positive effect of property rights on corporate governance, resource allocation, profit reinvestment, R&D activity, cash holdings and firm productivity (Cull and Xu, 2005; Lin, Lin and Song, 2010; An, 2013; Lu, Png and Tao, 2013; and Kusunadi, Yang and Zhou, 2015). Although the extant literature has recognized the importance of property rights security, little is known about whether and how changes in property rights protection influence firm capital structure choices, one of the most fundamental corporate policies. We address this question in this study.

*Ex ante*, it is unclear how property rights security influences firm capital structure choices. We propose and test two hypotheses. The “reinvestment hypothesis (RIH)” is based on empirical findings in Johnson, McMillan and Woodruff (JMW, 2002) and Cull and Xu (2005). Johnson, McMillan and Woodruff (JMW, 2002) find that entrepreneurs in five transition economies with the least secure property rights reinvest 40% less of their profits than those with the most secure property rights, irrespective of whether bank finance is or is not available. They argue that entrepreneurs will not invest if they don’t expect to be able to keep the returns from their investment. JMW further pronounce that “*secure property rights are both necessary and sufficient to induce investment by entrepreneurs* (pp.1336).” Consistent with this thesis, Cull and Xu (2005) find a positive correlation between property rights protection and reinvestment rates in China’s private firms. Based on the findings above, we hypothesize that as property rights protection strengthens, especially when the government is newly constrained by law from expropriating private profits, entrepreneurs are incentivized to reinvest more of their retained earnings and use less external debt. Therefore, the RIH predicts that firm leverage decreases as property rights become more secure, *ceteris paribus*.

The second hypothesis we examine, the “financial constraint hypothesis (FCH),” emphasizes the role of creditors in influencing firm-level capital structure choices. This literature stipulates that in a business environment where creditor rights are insecure--where the right to seize collateral from a defaulting borrower is not well protected or debt covenants are hard to enforce--banks may choose to curtail their lending to entrepreneurs (Djankov et al., 2008). Consistent with this hypothesis’ predictions, empirical studies find that small and medium sized enterprises tend to have higher debt levels in countries with efficient bankrupt laws (McNamara, Murro and O'Donohoe, 2017). Moreover, financially constrained firms are more likely to forego, or postpone, attractive investment opportunities if these cannot be funded with internal cash flows (Campello, Graham and Harvey, 2010).

The enactment of China’s Property Rights Law in 2007 strengthens creditor rights, giving creditors greater incentives to lend to entrepreneurs. However, we expect the Law to have uneven impacts on firms with different degrees of financial constraints. With added creditor rights protection, creditors are more willing than before to lend to financially constrained firms. Thus, the FCH predicts an increase in leverage in financially constrained firms over relatively unconstrained ones, as property rights protection improves.

To investigate the effect of property rights on firm leverage choices, we exploit a natural experiment in this study. China passed its Property Rights Law (referred to as “the Law”, hereafter) in 2007 at the Fifth Session of the 10<sup>th</sup> National People’s Congress (NPC). For at least two reasons, the passage of the Law represents an opportune setting for our study of corporate capital structure choice. First, prior to the enactment of the Law, China had provided very little formal recognition and protection of private property rights since the founding of the People’s Republic of China in 1949. The Law for the first time established the formal institution of private property rights protection in China’s legal system (Zhang, 2008). Therefore, the enactment of the Law can be viewed as an exogenous shock for research purposes, allowing us to isolate the impact of property rights on firm decisions without having to deal with reverse causality or other endogenous complexities. Second, the Law has two focal points relevant to our study, beginning with specific provisions that strengthen creditors’ rights in the event of defaults, incentivizing creditors to lend.<sup>1</sup>

---

<sup>1</sup> Article 170 of the Property Rights Law explicitly gives creditors the security interest priority in receiving compensation when the debtor defaults or the loan contract is not property enforced. Article 179 specifies that creditors have priority in receiving compensation from selling secured assets in case of debtor defaults or other conditions that lead to materialization of right to collateral.

Equally important, the Law broadly strengthens property rights protection for private business owners against government expropriation. This added protection is likely to encourage entrepreneurs to increase capital investments.

In a related paper, Berkowitz, Lin and Ma (2015) use an event study framework to examine the effect of the Law on firm value in China's listed firms, and find that the passage of the Law has a positive effect on Tobin's Q. While we also examine the effect of the Law's passage on listed Chinese firms as a robustness test, we choose to focus on China's unlisted sector in our paper, for three reasons. First, prior to 2007, most publicly listed firms in China were former state-owned enterprises restructured or carved out for publicly listing, and the government continued to hold significant ownership in many of these firms after 2007. As such, political interference is widespread in the listed sector. Second, one of the main objectives of the Law is to protect the property rights of private business owners against the "grabbing hands" of the government, since the dominance of state ownership had already been enshrined in China's first constitution in 1954 and in the subsequent amendments (Zhang, 2008). In addition, China's Company Law of 2006 (and subsequent revisions) explicitly protects cash flow rights of shareholders of limited liability or joint stock companies (Yueh, 2011). Thus, it is much more difficult for the government to expropriate from listed firms than from firms in the unlisted sector. Third, unlisted firms are more financially constrained than listed firms, as the listed ones have greater access to the capital markets for funding (Li, Yue and Zhao, 2009). Allen, Qian and Qian (2005) also point out that most of China's bank credit is issued to firms in the state and listed sectors and that the private sector only received 24% of bank credit or loans. In summary, China's unlisted sector is particularly constrained by the country's institutional development. Therefore, the strengthening of property rights should have more pronounced effects in the unlisted sector, making it a more suitable setting to examine our research question.

We first conduct full sample comparisons of firm leverage ratios in the Law's pre- versus post-enactment periods. We find that the average firm in the sample experiences a significant leverage decrease following the Law's enactment. This is consistent with the reinvestment hypothesis, which argues that entrepreneurs are more willing to reinvest their own profits and use less external debt as property rights protection strengthens. Our results hold after checking for robustness and other alternative explanations.

To test the financial constraint hypothesis, we partition the full sample into various subsamples largely based on a firm's relative ease of access to external finance prior to the Law's passage. The FCH points to a more pronounced effect of the Law on financially constrained firms than on the unconstrained ones. We choose ownership structure, firm size and asset tangibility to proxy the financial constraint level faced by firms.<sup>2</sup>

We first investigate the effect of asset tangibility on the relation between property rights and leverage. JMW (2002) use collateral as a proxy for access to finance since firms with more collateral have better access to external debt. Cerqueiro, Ongena and Roszbach (2016) stipulate the importance of collateralization on banks' incentives to provide credit, design contracts and monitor borrowers. We use fixed assets over total assets as a proxy for asset tangibility (Berkowitz et al, 2015). Prior to the Law's enactment, in making lending decisions, creditors relied heavily on the amount of fixed assets that could be collateralized. As property rights protection strengthens, creditors are more willing to lend to firms with low tangibility but good profit histories and future prospects, such as service industry firms and high-tech companies. Our subsample findings are consistent with the FCH and supports the notion that the Law benefits low tangibility firms more than high tangibility ones for gaining access to external debt.

We then examine the effect of ownership structure on the property rights-leverage relation. Though our sample consists of mostly privately-owned firms, the average firm in the sample still contains about 11% government or collective ownership. Government ownership has been linked to a higher likelihood of political intervention and a greater risk of pursuing non-economic objectives at the expense of other stakeholders (Cull and Xu, 2005; Jefferson and Rawski, 2002; Megginson and Borisova, 2011; Wei et al. 2005). Chinese firms with government ownership have also been linked to soft-budget constraints due to better access to state-owned banks (Cull and Xu, 2005; Megginson et al. 2014). Therefore, we argue that private firms are more financially constrained than state-owned firms. We find that relative to firms with government ownership, private firms experience an increase in leverage after the Law takes effect, consistent with the FCH. This finding suggests that the Law effectively incentivizes creditors to lend more to private firms.

We also examine the effect of firm size on the property rights-leverage relation and find that small firms experience an increase in leverage relative to large firms after the Law's enactment,

---

<sup>2</sup> Investment-cashflow sensitivity is not employed to proxy financial constraints, as Kaplan and Zingales (1997) show that such sensitivity provides no useful measure of financial constraints.

also consistent with FCH predictions. Firth et al. (2009) contend that smaller firms have difficulty obtaining external finance in developing economies. Small firms also have few political connections, which are vital channels to gain access to credit in developing countries such as China, where financial systems are underdeveloped and dominated by state-owned banks. After the Law takes effect, creditor rights are better protected. As such, banks should be more willing to consider loan applications from smaller firms that they would have ignored previously. This size effect is also consistent with Beck et al. (2005), who show that smaller firms are more financially constrained and that when institutional obstacles are eased, smaller firms benefit more.

Before concluding that the Law's passage was the only, or even primary cause of the decline in Chinese company leverage after 2006, we examine the possible confounding impact of three other significant policy and macroeconomic events that occurred shortly after the Law became effective in March 2007. These are: (1) adoption of a new labor protection law in 2007, which increased employment security for Chinese employees; (2) a new enterprise income tax law, which reduced effective tax rates for most Chinese incorporated firms, also passed in 2007; and (3) the onset of the Global Financial Crisis in 2008, to which the Chinese government adopted swift and effective counter-measures, including flooding the economy with easy bank credit. We conclude our basic results that the Law's adoption lead to a significant decline in leverage for Chinese firms is robust to all these potential confounding events. We also examine whether the Law's passage lead to a decline in leverage for China's listed companies, and confirm that listed firms also reduced leverage after 2006.

Our paper makes several contributions to the literature. First, we are among the first to provide direct evidence that property rights protection matters in firm capital structure decisions. JMW (2002) attempt to disentangle the intricacies of property rights, access to finance, and profit reinvestment in five transition economies in eastern Europe and the former Soviet Union. We exploit an exogenous shock and directly examine the link between property rights and firm leverage decisions in China, the world's biggest transition economy. Specifically, we provide novel evidence that property rights significantly influence firms' borrowing in China's unlisted sector, and that ownership structure, firm size, and asset tangibility all significantly impact the property rights-capital structure relationship.

Second, we add new empirical evidence to the literature on how institutions impact firm-level financial decisions. It has been well documented that legal systems impact the development

of financial markets (La Porta et al., 1998; La Porta et al., 2008) and that corporate and personal tax rates are important determinants of capital structure and investment behavior (Fazzari, Hubbard and Petersen, 1988; Faccio and Xu, 2015; Zwick and Mahon, 2017). Macroeconomic factors—such as financial sector development, government borrowing and macroeconomic uncertainty—also play a more important role influencing the leverage of U.S. firms than do firm characteristics (Graham, Leary and Roberts, 2015). Although many institutional factors have been shown to affect capital structure, McMillan (1997) and Shleifer and Vishny (2002) argue that there exists a hierarchy among institutions, where certain institutions will function only after others have been established and functioning properly. Indeed, JMW (2002) show that the institution of property rights takes precedence over financial systems. And they specifically point out that “*if property rights are insecure, it is immaterial whether or not finance is available* (pp. 1336).” Our paper adds empirical evidence supporting the importance of the institution of property rights protection in affecting firm leverage decisions.

Last, but not least, our paper adds to the very limited but growing literature examining firm behavior in China’s private sector (Acharya and Xu, 2017; Firth et al., 2009; Gao, Harford and Li, 2013; Gao, Harford and Li, 2017). To date, most of the business research on China focuses on the publicly listed sector and somewhat overlooks the increasingly important private sector.<sup>3</sup> This is despite the fact that the non-state sector’s share of industrial output has grown from 22% in 1978 to about 80% in 2016 (Chen, Liu and Su, 2013; Garnaut, Song and Fang, 2018) and by 2018 the private sector provides over 80% of jobs in the country and accounts for more than 60% of China’s fixed-asset investment.<sup>4</sup>

The rest of the paper is organized as follows. Section 2 provides institutional background on China’s Property Rights Law of 2007 and presents an overview of China’s private sector. Section 3 discusses empirical methods and describes our data and sample. Section 4 and 5 present and discuss the empirical results related to the reinvestment hypothesis (full sample analysis) and the financial constraint hypothesis (subsample analysis), respectively. Section 6 examines the effect of China’s Property Rights Law on capital structure in listed firms, while Section 7 concludes.

---

<sup>3</sup> A few notable exceptions are Cull and Xu (2005), Firth et al. (2009), Li et al. (2009), Chen et al. (2013).

<sup>4</sup> China Daily, 3-6-2018, “China’s private sector contributes greatly to economic growth: federation leader.”

## **2. Institutional Background**

### *2.1. The 2007 Property Rights Law of China*

Since the adoption of China's famous "Opening-Door" policy in 1978, various economic reforms were enacted that sparked spectacular economic growth. As China's economy became more market-oriented, protection of property rights became a pressing issue. On March 16, 2007, after a fourteen-year legislative marathon, the long awaited and highly debated Property Rights Law of China passed the National People's Congress.

The Property Rights Law was adopted to define and protect private property and the rights of private property owners. The Law was widely acclaimed as a substantial step toward protection of private property rights. Zhang (2008) points out that the Law fills in the country's "legal blank" with regards to private property and property in general. The Law establishes a framework badly needed for the regulation as well as protection of property rights, and it reinforces the inviolable nature of private property in China. The latter is particularly important because the principle that private property is inviolable was denied in China until 2004, when the 1982 Chinese Constitution was amended for the fourth time.<sup>5</sup>

The Property Rights Law was intended to be a comprehensive legislation on property, with 247 articles comprising five parts and nineteen chapters. Several features are worth noting, beginning with the equal protection of public and private ownership. For years, public ownership enjoyed supreme status in China, as many believed that socialist economies were all centered on public ownership. The Property Rights Law, for the first time, makes equal protection a basic principle of the law of property. For example, Article 4 of the Property Rights Law is clear that a violation of property rights is prohibited, regardless of the type of property owner.

Second, creditor rights are strengthened. Part Four of the Property Rights Law, "Security Interests in Property", concerns the rights involving mortgages, pledges and liens. The Law gives creditors a security interest priority in having their claims paid in case of default. For example, Article 170 stipulates that "the holder of security interests shall have the priority in having his

---

<sup>5</sup> The current version of the Constitution of China was adopted in 1982 by the 5th National People's Congress with further amendments in 1988, 1993, 1999 and 2004. The 2004 amendment includes guarantees regarding private property. Specifically, under Article 13, citizens' lawful private property was declared "inviolable". This was the first time that private property was clearly stated in the Chinese constitution since 1949. It was also the first time in China that private property was deemed constitutionally inviolable.

claim paid if a debtor defaults or the conditions for enforcement of the said interests, as agreed upon by the parties concerned, arise.” According to Article 179, ‘Where a debtor or a third party, for guaranteeing the payment of debts, mortgages property to a creditor instead of transferring of the possession of such property, if the debtor defaults or the conditions for enforcement of the interest, as agreed upon by the parties concerned, arise, the creditor shall have priority in having his claim paid with the property.’ Article 174 gives creditors of security interest priority in getting insurance monies, compensation or indemnities “in case of damage or destruction, loss or requisition of the mortgaged property during the period of guarantee”. The law also clarifies the scope of security interest as it “embraces the principal creditor’s right and the interest therefrom, penalty, damages and expenses for safekeeping of the property used as security and for enforcing security interest.” (Article 173).<sup>6</sup>

We utilize the 2007 Property Rights Law enactment in China as a natural experiment to study firm capital structure decisions. Because the passage of the Law by the People’s Congress of China is outside the control of individual businesses, it can be considered as an exogenous shock to firms. The Law involves universal strengthening of property rights protection. Therefore, the Law offers an ideal setting to study how firm leverage policies change in response to better property rights protection without endogeneity concerns.

## 2.2. *Private firms in China*

Most of the research on capital structure is devoted to publicly traded firms in numerous developed and developing economies, especially the United States. Public firms and private firms may be systematically different from each other regarding their ownership structures, financing frictions, agency problems and asymmetric information issues (Acharya and Xu, 2017; Firth et al., 2009; Gao, Harford and Li, 2013; Gao, Harford and Li, 2017). The lack of available data on private firms limits comparable research on privately held firms in developing economies. This is particularly the case for China. The Chinese statistical authorities began publishing data on registered private firms in the industrial and service sectors in the late 1990s. According to their data, the number of registered private enterprises grew from 443,000 in 1996 to 5,918,000 in 2012 (National Bureau of Statistics of China, 1998; 2013c, 28-29), accounting for more than 70% of all

---

<sup>6</sup> The English-language text of the Property Rights Law is available for downloading at [http://www.npc.gov.cn/englishnpc/Law/2009-02/20/content\\_1471118.htm](http://www.npc.gov.cn/englishnpc/Law/2009-02/20/content_1471118.htm).

firms. Private firms have also become important employers in the economy. As of 2010, employment in registered private firms exceeded 94 million (National Bureau of Statistics of China, 2011a, 125). They are also economically important in terms of industrial output. Roughly 30% of the output in the industrial sector in 2010 was produced by private companies. Huang (2012) reports that the private sector in China accounted for about 50 percent of national GDP in 2011. Despite their huge economic importance, private firms in China have been under-researched by economists. Our study offers a look into the capital structure decisions of Chinese private firms.

### 3. Methodology and Data

#### 3.1. Full sample analysis: The reinvestment hypothesis

To analyze the impact of the Property Rights Law on corporate capital structure decisions for the full sample, we employ an OLS approach in which we compare firm leverage ratios before and after the enactment of the Law.

In the full sample, we estimate Eq (1) below:

$$Y_{it} = \delta \text{POST}_t + \gamma X_{it} + \alpha_i + \alpha_t + \varepsilon_{it} \quad (1)$$

Where  $i$  indexes firms,  $t$  indexes time,  $Y_{it}$  is a measure of firm capital structure,  $X_{it}$  are control variables,  $\text{POST}_t$  is a year indicator variable that equals one for the Law's post enactment years, and zero for the pre-enactment years.  $\varepsilon_{it}$  is an error term. The firm effects,  $\alpha_i$ , control for any fixed differences across firms, while year dummies,  $\alpha_t$ , control for aggregate fluctuations.  $\delta$  is our coefficient of interest, which estimates the impact of the Property Rights Law. The reinvestment hypothesis predicts a negative and significant  $\delta$ .

We examine four measures of capital structure. Leverage (LEV) is the total debt ratio, defined as total liabilities over book assets (Li et al., 2009). We then break the total debt ratio into two components. AP is accounts payable scaled by book assets, which captures the main noninterest-bearing component of total liabilities. Debt is defined as total liabilities minus accounts payable divided by book assets, as a proxy for firms' use of interest-bearing debt. LTD is long-term liabilities over book assets, where CSMAR defines liabilities with maturities greater than one year as long-term liabilities.

Following previous capital structure literature (Chen, Jiang and Lin, 2014; Öztekin, 2015), we employ the following control variables ( $X$ 's) to explain firm capital structure decisions. Firm

size, as measured by the natural log of total assets, has been argued to lower the likelihood of bankruptcy as well as bankruptcy costs (Booth et al., 2001; Frank and Goyal, 2009; Öztekin, 2015). Tangible assets can be viewed as good candidates for collateral (Titman and Wessels, 1988; Öztekin, 2015). We measure asset tangibility as fixed assets divided by total assets. Petersen and Rajan (1994) suggest that a company becomes better known as it ages and this reputation expands its access to capital. We thus control for firm age, measured as the natural log of the number of years since start plus one, in our regressions. We also include the profitability measure, return on assets ROA, as Myers and Majluf (1984) suggest that firms use debt financing only when internal funding is insufficient. We calculate ROA as operating profit divided by book assets. Sales growth is used to proxy for a firm’s growth opportunities (Frank and Goyal, 2009). We calculate sales growth as sales-last year’s sales divided by last year’s sales. We also include a measure of the Chinese market development level in each province, in light of the finding in Li et al. (2009) that regional development differences matter to firm leverage decisions in China. Proposed by Fan and Wang (2009), the marketization index has a range from 0 to 10, with a higher value indicating a higher degree of market development at the province level.

### 3.2. *Subsample analyses: The financial constraint hypothesis (FCH)*

While it is important to examine the effect of the Property Rights Law on an average firm in the full sample, from a policy implication perspective, it is more meaningful to investigate how the Law impacts firms with different characteristics. In our subsample analyses, we focus on the effect of financial constraints on the property rights-leverage relation. To test the FCH, we employ a difference-in-differences (DID) approach and estimate Eq (2), as shown below:

$$Y_{it} = \delta_1 \text{CHARACTERISTIC}_{it} + \delta_2 \text{CHARACTERISTIC}_{it} \times \text{POST}_t + \delta_3 \text{POST}_t + \gamma X_{it} + \alpha_i + \alpha_t + \varepsilon_{it} \quad (2)$$

Where  $\text{CHARACTERISTIC}_{it}$  represents a firm’s characteristic we want to study. We examine three firm characteristics, private ownership (Private, defined as the fraction of non-state/non-collective shares), firm size (Ln\_ASSETS), and asset tangibility (FA, defined as the ratio of fixed assets to total assets), all of which are used as proxies for financial constraints in this study. The coefficient of the interaction term  $\text{CHARACTERISTIC}_{it} \times \text{POST}_t$ ,  $\delta_2$ , is the key coefficient of interest in Eq (2). The FCH predicts a significant  $\delta_2$ , the sign of which depends on the specific measure of financial constraint.

The firm characteristics used to proxy financial constraints in Eq (2) are continuous variables. As a robustness check, we modify Eq (2) as below:

$$Y_{it} = \delta_1 \text{CHARACTERISTIC\_DUM}_{it} + \delta_2 \text{CHARACTERISTIC\_DUM}_{it} \times \text{POST}_t + \gamma X_{it} + \alpha_i + \alpha_t + \varepsilon_{it} \quad (3)$$

Where CHARACTERISTIC\_DUM<sub>i</sub> represents a dummy variable defined according to each characteristic's relative value in the pre-enactment period. For instance, when we study the moderating effect of private ownership, we define PRIV\_DUM equals one if a firm has neither state nor collective ownership in the pre-enactment period and zero otherwise. Similar dummy variables are defined for firm size and asset tangibility.

### 3.3. *Data and sample*

Our initial data is from a dataset developed by China Stock Market & Accounting Research (CSMAR), which covers over 1.28 million unique non-listed companies from 1998-2012. It also reports firm production activities and financial information. One feature of this database worth noting is that it provides detailed information on firm ownership structure over time. To investigate the effect of the Property Rights Law on firm capital structure, we focus on three years before and three years after the Law took effect in 2007.<sup>7</sup> Our sample thus spans the period of 2004-2009. We exclude financial firms. We also require sample firms to have sales greater than RMB 1 million (roughly US\$131,500 in 2007 USD value) and to have more than 20 full-time employees. This procedure eliminates micro firms from the sample.<sup>8</sup> To ensure the comparability of companies, we further require sample firms to exist at least three years before and after the enactment of the Law. Our final sample has 629,221 firm-year observations for more than 107,000 unique firms. We winsorize all the dependent variables and Ln\_ASSETS, FA, ROA and GROWTH at the top and bottom 1%.

**\*\*\*\*\* INSERT FIGURE 1 HERE\*\*\*\*\***

Figure 1 shows our sample distribution by industry. Our sample firms come from a variety of industries, with textile, metal/nonmetal, equipment, and electronic and computer industries

---

<sup>7</sup> Though China's Property Rights Law was enacted on March 16, 2007, Berkowitz, et al (2015) use Dec. 29, 2006 as the event date in their paper, the day a draft of the Law was accepted by the 10<sup>th</sup> Standing Committee of the People's Congress. Therefore, we argue that it is reasonable to consider 2007 as a post-enactment year.

<sup>8</sup> Cull and Xu (2005) require their sample firms to have at least 20 (15) employees in the manufacturing (service) industry, respectively.

having the highest concentration of firms. These industries together account for more than 50% of the sample. Another significant portion of the sample companies operate in the food, wood-processing and raw chemical industries.

Table 1, Panel A provides descriptive statistics for sample firms. The average company in our sample has a book value of assets of RMB 77 million (median RMB 21 million). Fixed assets represent a nontrivial fraction of total assets, with a mean value of 34% (median 31%). Mean ROA is an impressive 10% with a comparable sales growth rate of 30%, while the median of ROA and sales growth are 4% and 13%, respectively. Our sample firms are 11 years old on average.

Debt is an important source of financing for our sample firms. The total debt ratio (LEV), calculated as total liabilities over total assets, has a mean value of 0.56 and a median of 0.58. We also partition the total debt ratio into an interest-bearing component versus a non-interest-bearing component. Our variable DEBT captures the use of interest-bearing debt in the capital structure and is calculated as total liabilities minus accounts payable divided by book assets. This ratio has a mean value of 0.40 (median 0.39), which suggests that the majority of the debt used by our sample firms bears interest. The non-interest-bearing component of debt is measured by AP (accounts payable scaled by book assets), which has a mean value of 0.16 (median 0.10). Most of our sample firms have difficulty raising long-term debt (LTD), as shown by the mean value of LTD of 0.04, where LTD is estimated as long-term liabilities with maturity over one year divided by total assets.

We also report information on PRIVATE, an ownership variable which measures the percentage of private ownership in a firm (non-state and non-collective). As shown, our sample firms are dominated by private ownership. On average, private ownership accounts for 89% of shareholdings in our sample, and more than 75% of sample firms are 100% privately owned. The variable POST equals one if a firm-year observation falls within the three post-enactment years, 2007-2009, and zero otherwise.

We conduct a univariate comparison of firm capital structures before and after the enactment of the Law. Specifically, we look at the means of the various debt ratios before (2004-2006) and after (2007-2009) the passage of the Property Rights Law. Table 1, Panel B reports the results. LEV decreases from 0.564 to 0.548. DEBT shows a slight drop from 0.404 to 0.399 in the post-enactment period, while LTD shows a similar pattern. All the decreases are significant at the 1% level. Panel B suggests that after the passage of the Law, firms use less debt in their capital

structures, consistent with the reinvestment hypothesis that with strengthened property rights protection, entrepreneurs are willing to reinvest more internally generated profits and use less external financing.

Table 1, Panel C reports the Pearson correlation coefficients for variables used in our analyses. Consistent with the literature, large sample firms tend to use more debt, as do mature firms. The marketization index has a positive correlation with a firm's debt use, possibly due to the availability of capital and better enforcement of contracts. Private ownership is negatively associated with firm debt use. This is consistent with the observation that in developing countries, private businesses have more difficulties than state-owned enterprises in accessing external debts (Firth et al., 2009).

\*\*\*\*\* INSERT Table 1 HERE\*\*\*\*\*

#### **4. Empirical Results: The Reinvestment Hypothesis**

##### *4.1. The baseline results*

We first investigate the effect of property rights protection on capital structure choices for the full sample. We estimate our baseline model, Eq (1), and present the panel regression results using clustered standard errors in Table 2. The explanatory variable of interest is POST, the indicator variable for the Law's post-enactment period. As shown in Table 2, the coefficients of POST are negative and significant for all four measures of leverage, indicating that leverage decreases after the enactment of the Law. These results are consistent with the reinvestment hypothesis, which predicts that when property rights protection improves, firms are willing to reinvest more of their profits, leading to less use of external debt.

Table 2 also documents the effects of key firm characteristics on firm capital structure choices. Firm size (Ln\_ASSETS) is negatively related to total debt ratio (LEV), and this outcome is entirely driven by firms' declining usage of supplier credits (AP). As shown in columns (3) and (4), after excluding AP from total liabilities, firm size becomes positively linked to the use of interest-bearing debt (DEBT) and long-term debt (LTD), respectively. These results indicate that bigger firms have better access to external interest-bearing debt than smaller firms. Asset tangibility (FA) is negatively linked to total debt ratio (LEV) and total interest-bearing debt ratio (DEBT), but positively linked to long-term debt ratio (LTD). The latter indicates that when evaluating long-term loans, lenders focus on firms' fixed assets that can be collateralized.

Consistent with Petersen and Rajan (1994), firm age ( $\text{Ln\_AGE}$ ) is positively related to all measures of leverage, largely because older firms have longer verifiable business records and more established relations with suppliers and creditors. Firm profitability (ROA) is negatively linked to all four measures of leverage. These results suggest that on average, more profitable firms are less likely to borrow, consistent with the pecking order theory of capital structure (Myers and Majluf, 1984). As expected, high growth firms borrow more (GROWTH).

\*\*\*\*\* **INSERT Table 2 HERE**\*\*\*\*\*

#### 4.2. *Robustness checks*

The enactment of China's Property Rights Law in March of 2007 represents an exogenous shock to firm-level decisions, as well as to creditors' lending behavior. In the three post-enactment years, there could be other confounding macro and/or policy shocks, which would conflate our results. To address this concern, we carefully examine all business-related laws passed by the People's Congress of China and all major macro policy initiatives carried out by the government in 2007, 2008, and 2009. During this three-year period, China passed three major pieces of business-related legislations, namely, the Property Rights Law of China in March 2007 (the focus of this study), the Labor Law of China in June 2007, and the Enterprise Tax Law in January 2008. Additionally, the Chinese government adopted aggressive policy responses to the Global Financial Crisis, which began in late 2008. We examine the possible impact of each of these events in this section. In section 6, we also examine whether the Law's passage lead to a decline in leverage for China's listed companies.

##### 4.2.1 *The effect of the labor law change in 2007*

The main theme of the Labor Law is the protection of worker's rights, including collective bargaining for wages and benefits and mandatory legally binding written contracts for all workers. We argue that the Labor Law does not have direct impact on firm-level capital structure choices, though it might affect other firm-level decisions.

The theoretical impact of better employment protection on unlisted firm leverage is ambiguous, and most of the precursor literature is from developed country economies. Agrawal and Matsa (2013) find that a reduction in labor force unemployment risk resulting from statutory improvements in (U.S.) state unemployment insurance laws is associated with a subsequent increase in corporate leverage in affected firms, implying that better employment protection reduces the need for companies to maintain low leverage to protect their workforce against

unemployment risk. On the other hand, Simintzi, Vig, and Volpin (2015) find that because increases in the stringency of national employment protection laws effectively increase fixed costs for companies, these legal changes are associated with subsequent *reductions* in corporate leverage.

#### 4.2.2 *The effect of the enterprise tax law change in 2007*

The Enterprise Income Tax Law of China was adopted at the 5th Session of the 10th National People's Congress on March 16, 2007. It went into effect on January 1, 2008.<sup>9</sup> The most relevant change in the new tax law is that the enterprise statutory tax rate was lowered from 33% to 25%. This change could potentially conflate our finding that leverage decreases was mainly resulted from the property rights law's enactment. First, the lowering of marginal tax rate reduces the interest tax-shield benefit from long-term debt usage. As a result, firms may reduce their long-term debt usage, leading to an overall decrease in leverage. However, as shown in Table 1 (Panel B), the long-term debt component (4.5%) for an average firm in our sample is significantly smaller than the short-term debt component (40.4% - 4.5% = 35.9%). A simple calculation would show that the loss in interest tax-shield due to the reduced tax rate is an economically insignificant amount of RMB 23,452 per year for the average firm with total book assets of RMB 81.43 million (assume an 8% cost of debt). Therefore, we argue that long-term debt interest tax-shield loss is not a significant driving force for firms to reduce debt ratios.

Another potential conflating effect of the new tax law is that firms can keep more of their profits for investments due to reduced tax rate, leading to less need for external debt (the pecking order theory). To address this concern, we control for firm operating profit (ROA) in all our regressions, and our results hold.

The second relevant change in the new tax law is that the super-preferential tax treatment for foreign firms was eliminated. Our dataset does not contain foreign ownership information. Hence, we are unable to empirically examine the effect of this provision on firm capital structure choices. However, we argue that this provision works in our favor. Before the enactment of the 2007 enterprise tax law, foreign firms in China paid very little or no taxes and extended period of time. Therefore, they did not benefit from the long-term debt interest tax-shield. After the new tax law went into effect, foreign firms have to pay taxes similar to their domestic counterparts. This in turn may incentivize foreign firms to use more long-term debt due to new interest tax-

---

<sup>9</sup> [http://www.fdi.gov.cn/1800000121\\_39\\_3339\\_0\\_7.html](http://www.fdi.gov.cn/1800000121_39_3339_0_7.html)

shield benefits, *ceteris paribus*.

#### 4.2.3 *The effect of the 2008-2009 financial crisis*

There could also be another alternative explanation to the overall leverage decrease in the post-period documented in Table 2. Two of the three post-enactment years coincided with the 2008-2009 global financial crisis, which was characterized by widespread credit crunches. It could be that during the financial crisis, China's credit supply to the private sector declined, contributing to the overall leverage decrease documented in this study. Though we control for year fixed effects in all of our regressions, we provide two additional robustness checks to address this concern.

We first compare pre- and post-enactment leverage changes by using only 2006 as the pre- and 2007 as the post-enactment year, thus excluding the financial crisis years of 2008 and 2009. These results are free from the effects of the 2008-2009 financial crisis and are highly consistent with our baseline results shown in Table 2.<sup>10</sup>

We next examine China's credit supply over the sample period. We use the World Bank's measure of credit supply, defined as domestic credit to the private sector over GDP. As shown in Figure 3, China's credit supply to private sector experienced a gradual down trend, starting in the pre-enactment years and continuing into the post-years of 2007 and 2008. However, on the outset of the global financial crisis (the third quarter of 2008), the Chinese government announced a large stimulus package (RMB 4 trillion, or US\$580 billion) that combined an active fiscal policy and an expansionary monetary policy (Li, Willett and Zhang, 2012). As a result, credit supply to private sector experienced a huge jump in 2009, from about 100% GDP in 2008 to over 120% GDP in 2009 (Figure 3). The fact that credit supply increased during the financial crisis helps strengthen the reinvestment hypothesis explanation of the main finding of our study. At the minimum, we can qualitatively rule out credit crunch during the financial crisis being the cause of the documented leverage decrease following the Law's enactment.

Empirically, we include China's domestic credit to the private sector over GDP as a control variable and re-estimate Eq. (1). The results are highly consistent with those documented in Table 2 across all dependent variables.<sup>11</sup> As discussed earlier, this policy initiative, also an exogenous shock, works in favor of our reinvestment hypothesis.

---

<sup>10</sup> The results are untabulated for brevity reasons and available upon request.

<sup>11</sup> The results are untabulated for brevity reasons and available upon request.

\*\*\*\*\* INSERT Figure 2 HERE\*\*\*\*\*

In summary, we argue that the aforementioned policy and macroeconomic events do not weaken our overall results that the enactment of the property rights law lead to the overall leverage decrease.

## 5. Empirical Results: The Financial Constraint Hypothesis

In subsample analyses below, we focus on the impact of financial constraints on the property rights-leverage relation. We partition the full sample into various subsamples largely along the line of a firm's relative ease of access to external finance in the pre-enactment period. As discussed earlier, the Financial Constraints Hypothesis predicts a more pronounced effect of the Law on financially constrained firms than on the unconstrained ones, relatively speaking. More specifically, we expect to observe a leverage increase in the financially constrained firms following the Law's enactment. As mentioned earlier, we use three firm characteristics as proxies for financial constraints, namely private ownership, firm size, and asset tangibility. We estimate DID Eq (2) and Eq (3) to obtain the panel regression results.

### 5.1. *The effect of asset tangibility*

We conclude this section by investigating the effect of asset tangibility on the relation between property rights protection and firm capital structure decisions. We use fixed assets (FA) over total assets as a proxy for asset tangibility (Li et al., 2009; Berkowitz et al, 2015). Prior to the Law's enactment, when making lending decisions, creditors focused heavily on the amount of fixed assets that could be collateralized (Firth et al. 2009; Chen et al. 2013; Cerqueiro, Ongena and Roszbach, 2016). Hence, firms with low asset tangibility are more financially constrained than are high asset tangibility ones in terms of access to external credits. As private property rights protection is institutionalized post-enactment, the credit market becomes more developed. As a result, credit analyses become more sophisticated and are no longer a mere evaluation of collateral. Like their counterparts in developed economies, Chinese lenders are more willing to lend to firms with low tangibility but a solid business history or prospects, such as firms in the service and high-tech industries that traditionally have low asset tangibility.<sup>12</sup>

---

<sup>12</sup> Lim, Macias and Moeller (2014) argue that intangible assets can be very effective in generating cash. Loumiotis (2012) contends that sophisticated lenders accept liquid and re-deployable intangible assets as

The financial constraint hypothesis predicts that post-enactment, firms with low tangibility experience a bigger increase in leverage than those with high tangibility. We present our DID regression results in Table 3. As shown in Panel A, the coefficients of the interaction term, FA\*POST, are negative and significant for all three leverage measures (columns (1), (3) and (4)), indicating a negative correlation between firm leverage and asset tangibility. These findings provide strong evidence that as property rights become more secure, firms with relatively low asset tangibility improve their access to external credit.

In Panel A, the asset tangibility measure (FA) is a continuous value. As a robustness check, we divide the full sample firms into three groups by asset tangibility dummies, low (FA\_low=1 if bottom third), middle (FA\_mid=1 if middle third), and high tangibility (FA\_high=1 if top third, our default category). We re-estimate our DID models and the results are presented in Panel B. The results are fully consistent with those in Panel A. Moreover, firms in both the bottom third and the middle third experience a significant leverage increase over firms in the top third group.

\*\*\*\*\* INSERT Table 3 HERE\*\*\*\*\*

## 5.2. *The effect of ownership structure*

Owing to the legacy of China's planned economy, various levels of governments continue to take stakes in some of the firms in the private sector. Government ownership in developing economies represents a double-edged sword. On the one hand, governments have political, non-profit maximization objectives (Megginson and Netter, 2001). Government ownership has been linked to a greater expropriation risk (Bai et al., 2006) and a higher political intervention risk (Jefferson and Rawski, 2002; Cull and Xu, 2005; Borisova et al., 2015). On the other hand, government ownership helps establish political connections between the firm and state-owned banks, leading to better access to capital (Firth et al., 2009). When the institutional environment is weak, entrepreneurs with political connections tend to reinvest more than entrepreneurs without political connections (Ge et al., 2017). Cull and Xu (2005) and Megginson et al. (2014) further argue that government ownership leads to soft-budget constraints. *Ceteris paribus*, government ownership is linked to fewer financial constraints, whereas private ownership is linked to more financial constraints.

---

collateral, as they have identified ways to leverage, finance and value intangible assets. Ellis and Jarboe (2010) provide examples of intangible asset-backed loans.

*A priori*, it is not clear how government ownership affects the property rights protection-capital structure relation. Creditors' willingness to lend clearly is influenced by their perceptions of the likelihood of being 'robbed' by the government in case of default. Putting a check on the government's "grabbing hand" by giving equal protection to public and private property (Zhang, 2008), the Law may alleviate creditors' concerns and strengthen their willingness to extend credit to firms with government ownership. The reduced concern for the grabbing hand would predict a more pronounced effect of the Law on leverage as firm government ownership rises.

A counter argument could be made that firms with little or no government ownership are more attractive to lenders. Cull and Xu (2005) find that the share of private ownership has a positive effect on the rates of profit reinvestment. Borisova et al (2015) also show that in "normal" times—before the 2008-10 Global Financial Crisis—state ownership of a firm's stock increases the cost of its bonds, then the relationship flips during the crisis as investors put greater weight on the implicit guarantee aspect of state ownership. Private firms tend to be better run than SOEs, yet they lack the easy access to capital that comes with government ownership in China (Firth et al., 2009). As such, firms with little or no government ownership have a strong demand for capital. By incentivizing creditors to lend, the Property Rights Law could exert a larger impact on these firms by influencing both the supply and demand sides of capital acquisition.

Table 4 contains the estimation results of our DID regression models. Our primary variable of interest is the interaction term, PRIVATE\*POST, the interaction of firm percentage private ownership (PRIVATE) and the indicator for the Law's post-enactment period (POST). As indicated in Column (1), the coefficient of the interaction term is significant and negative, indicating a decline in total debt ratio (LEV) as private ownership increases in the post-enactment period. However, this decline is entirely attributable to the decrease in the accounts payable component of total liabilities (AP, column (2)). In fact, as shown in columns (3) and (4), respectively, the interest-bearing debt ratio (DEBT) and long-term debt ratio (LTD) both increase significantly as private ownership increases.

As a robustness check, we interact POST with PRIV\_Dum, a dummy equal to one if a firm is 100% privately owned, and zero otherwise. We re-estimate our DID models and report the results in Panel B. These results further support our conjecture that the effect of the Property Rights Law on firm-level interest-bearing leverage choices is more pronounced in private firms with little or

no government ownership. In conclusion, results in this section indicate that private firms in general benefit more from the Law than state-owned enterprises.

\*\*\*\*\* INSERT Table 4 HERE\*\*\*\*\*

### 5.3. *The effect of firm size*

We now explore the role of firm size in the relationship between property rights protection and capital structure choices. Beck et al. (2005) study how firm size affects the relationship between firm growth and business obstacles (legal, financial and corruption problems) and find that smaller firms consistently face higher levels of business obstacles. They further find that when financial and institutional development weakens these growth obstacles, small firms benefit more than large firms. Cull and Xu (2005) argue that weak property rights protection represents a major obstacle to firm development. They also document evidence among Chinese firms that access to finance and government expropriation affect small firms more than large ones. The enactment of China's Property Rights Law represents a major institutional advancement. As such, we expect the Law to have a more pronounced effect on small firms than on large firms. Specifically, we expect that, post-enactment, smaller firms will experience a bigger increase in leverage than will large firms. We test this conjecture in this section.

Table 5 reports our DID regression results for the size effect. As shown in Panel A, the coefficients for the interaction between firm size (Ln\_ASSETS) and post-enactment of the Law (POST), Ln\_ASSETS\*POST, are significant and negative in both interest-bearing debt measures (columns (3) and (4)). The negative sign indicates that, post-enactment, leverage decreases as firm size increases. In other words, small firms exhibit significantly bigger leverages increase than do large firms in the post-enactment period.

In Panel A, firm size is a continuous measure. As a robustness check, we follow Beck et al. (2005) and divide the full sample into three size groups using dummy variables: Small=1 (if in the bottom third in size), Middle=1 (if in the middle third), and Large=1 (if in the top third), which is the default category in our regressions. We re-estimate our DID models and report the results in Panel B. The coefficients of the interaction terms, Small\*POST and Middle\*POST, are our focus here and are mostly positive and significant across the leverage measures. These results are consistent with those in Panel A, although the size effect is nonlinear. In particular, we observe that post-enactment, medium-size firms experience a significantly bigger increase in all three measures of leverage than do large firms (columns (1), (2) and (4)). Small firms also experience a

bigger increase in their long-term debt ratios (LTD) than do large firms (column (4)). In addition, small firms receive relatively more supplier credit (AP) than do large firms following the Law's passage (column (2)).

\*\*\*\*\* INSERT Table 5 HERE\*\*\*\*\*

## **6. The Effect of the Law on the Listed Sector**

The focus of our study is on the unlisted sector, where we find empirical evidence supportive of both the “reinvestment hypothesis” in section 4 (full sample analysis) and the “financial constraint hypothesis” in section 5 (subsample analyses). As a robustness check, in this section we examine the effect of the property rights law on China's listed firms. We argue in the introduction and reiterate here that different market, institutional and regulatory forces are at work in influencing firm level decisions for the unlisted and listed firms. Therefore, we conjecture the enactment of China's property rights law should have different effects on these two groups of firms.

It is tempting to quantitatively compare how the Law impacts leverage decisions of the unlisted versus the listed firms. However, in addition to the aforementioned different forces influencing unlisted and listed firms, we observe two notable imbalances between these two groups. The first is the huge difference in sample sizes. The final unlisted sample has 629,161 firm-year observations (Table 1, Panel A), whereas the sample of listed manufacturing firms has 5,246 firm-year observations (Table 6). The second is the dramatically different firm sizes between these two groups. The median (mean) total asset in the unlisted sample is RMB 20.72 (81.43) million (Table 1, Panel A), while the median (mean) total assets in the listed sample is RMB 1,619 (1,301) million (Table 6). Measured by median (mean), a listed firm is 78 (16) times larger than an unlisted firm. If we were to use firm size as one of the matching criteria, we would be matching the largest unlisted firms versus the smallest listed firms, which would make it difficult to generalize and interpret the matching results. Therefore, we argue that the unlisted and listed sectors are not empirically comparable. Instead, we opted to examine the effect of the Law on the listed firms separately, as opposed to a matching analysis. We infer qualitative comparisons with the unlisted firms based on the empirical results.

We first discuss descriptive statistics of the listed sample, in comparison to the unlisted sample. We then test the reinvestment hypothesis by analyzing the full sample. Lastly, we test the financial constraint hypothesis by analyzing various subsamples of the listed firms.

### 6.1. *Full sample analysis: the reinvestment hypothesis*

In our analyses of the listed firms, we include only firms in the manufacturing sectors, since our unlisted sample includes only manufacturing firms.<sup>13</sup> In addition to the aforementioned differences in firm size and number of observations between the unlisted versus the listed firms, we also observe other interesting comparisons. As shown in Table 6 (listed firms) and Table 1 (Panel A, unlisted firms), the mean total liabilities (LEV) for the listed firms is 55% of book assets, similar to that of the unlisted firms (56%). However, the components of LEV are quite different between these two groups. Unlisted firms rely much more on supplier credits (AP, 16%) and less on long-term debt (LDT, 4%), compared to the listed firms that have a mean AP of 9% and LDT of 8%. This is expected given that listed firms have access to bond market and better access to formal financial institutions, relative to unlisted firms.

We also observe that on average, the unlisted firms (Table 1, Panel A) are five times as profitable as the listed firms (Table 6), measured by ROA. Furthermore, unlisted firms on average grow faster than the listed firms by 7 percentage points. These two observations are important and provide further support to our argument that the unlisted sector is a more useful setting to examine the effect of China's property rights law on firm capital structure choices. First, the fact that the unlisted firms are much more profitable affords them the freedom to reinvest more of their retained earnings if they perceive that the Law helps constrain bureaucrats from appropriating the fruits of their investments. Second, the fact the unlisted sector grows at a much higher rate but had historically been and continued to be disadvantaged by the formal financial institutions called for policy actions to level the playing field.<sup>14</sup> One such action was the enactment of the 2007 property rights law. Hence, we reiterate that the unlisted sector is a more useful setting to examine if the Law has made incremental improvement for the financially disadvantaged firms.

\*\*\*\*\* **INSERT Table 6 HERE** \*\*\*\*\*

We re-estimate Eq. (1) using the full sample of listed manufacturing firms and report the results in Table 7. As shown, total liabilities (LEV), total debt (DEBT) and long-term debt (LTD)

---

<sup>13</sup> All the results in Section 6 are largely the same if we use all listed firms exclusive of financial and utilities firms.

<sup>14</sup> See the article in Wall Street Journal on 4/1/2019, entitled, "China's Entrepreneurs are Left High and Dry Despite a Flood of Credit," <https://www.wsj.com/articles/chinas-entrepreneurs-are-left-high-and-dry-despite-a-flood-of-credit-11554111004?mod=searchresults&page=1&pos=17>

all exhibit a significant decrease following the passage of the Law, consistent with the prediction of the reinvestment hypothesis.

\*\*\*\*\* **INSERT Table 7 HERE** \*\*\*\*\*

## 6.2. *Subsample analyses: the financial constraint hypothesis*

In this subsection, we partition the full sample of listed firms into various subsamples by their relative degrees of financial constraint. Following the methods used in the analysis of unlisted firms, we use three measures of financial constraint to partition the listed sample, i.e., asset tangibility (FA), ownership structure (PRIVATE), and firm size (Ln\_ASSETS). We re-estimate Eq. (2) and report the results in Table 8.

In Panel A, we report the regression results of the effect of asset tangibility (FA) on the property rights law – leverage relation. As shown, the coefficients of the interaction term, FA\*POST, are insignificant for all four measures of leverage. These results suggest that, for publicly listed firms, creditors do not change how they rely on collaterals when making lending decisions before and after the Law’s passage. To the contrary, for unlisted firms, creditors significantly reduce their reliance on asset tangibility after the passage of the Law.

In Panel B, we report the regression results of the effect of private ownership (PRIVATE) on the property rights law – leverage relation. As shown, the coefficients of the interaction term, PRIVATE\*POST, are insignificant for total liabilities (LEV), total debt (DEBT) and long-term debt (LTD). Existing studies have shown that state ownership is linked to soft-budget constraint, whereas private ownership is linked to more financial constraints (Cull and Xu, 2005; Megginson, et al. 2014). However, the results documented here suggest that, once becoming publicly traded, creditors do not distinguish whether the shares are owned by the government or by private investors, before and after the Law’s passage. Put differently, ownership structure in the listed firms has no impact of the property rights law – leverage relation. On the other hand, for unlisted firms, creditors are more willing to lend to private firms as creditor rights protection improves.

Lastly, we examine the effect of firm size (Ln\_ASSETS) on how the Law affects leverage decisions, and report the results in Panel C. As shown, the coefficients of the interaction term, Ln\_ASSETS\*POST, are insignificant for total liabilities (LEV), accounts payable (AP) and long-term debt (LTD). These results suggest that firm size, used here as a proxy for financial constraint, has no impact on how the Law influences firm’s decisions on total liabilities, supplier credit, or long-term debt. However, the coefficient is positive and significant for total debt (DEBT),

suggesting that the Law helps bigger (i.e., less financially constrained) firms improve their total debt capacity. This is opposite to the results documented in our analysis of the unlisted firms, where we find that the Law helps smaller (i.e. more financially constrained) firms improve their leverage position.

In summary, the findings in this subsection indicate that, for publicly listed firms, the degree of financial constraint plays little role in how China's property rights law of 2007 influence firm capital structure choices. To the contrary, in our analyses of the unlisted firms, we find that financial constraint plays an important role in how the Law influences firm capital structure decisions. Specifically, we find that financially constrained firms benefit more than the unconstrained ones as a result of the Law's enactment in terms of accessing external debt capital.

The fact that the financial constraint hypothesis holds for unlisted firms but not for the listed firms provides further support for our contention that the unlisted sector is a more appropriate setting to examine the effect the Law on firm capital structure choices.

\*\*\*\*\* **INSERT Table 8 HERE** \*\*\*\*\*

## **7. Conclusions**

This paper exploits a natural experiment, the enactment of China's Property Rights Law in 2007, to investigate the impact of property rights protection on firm capital structure. The Law contains specific provisions designed to strengthen creditor rights and to restrain governments from expropriating private property. These provisions, if enforced effectively, should incentivize creditors to lend and private businesses to invest in capital projects. However, *ex ante*, it is unclear how the Law would impact firm leverage choices, as there exist alternative hypotheses that point in both directions.

We employ a large dataset of non-listed Chinese firms in this study. Regression results from our full sample analyses show an overall decrease in leverage following the Law's enactment. These findings are consistent with the reinvestment hypothesis in that with better property rights protection, firms are willing to reinvest their retained earnings and thus use less external debt. Our results remain strong after several robustness checks.

Our findings of a decline in firm leverage at first seems to contradict one of the intended purposes of the Law, that is, to incentivize creditors to lend. We argue that this is not necessarily the case. The Law can still incentivize creditors to lend more, possibly to firms that they would not lend to previously. The financial constraint hypothesis predicts that pre-enactment financially

constrained firms should benefit more from the Law, relative to the unconstrained ones. In our subsample tests, we partition the full sample based on a firm's relative degree of financial constraint and employ a DID framework to empirically test this conjecture.

We find that the enactment of the Law indeed has different impacts on firms with different characteristics. First, ownership structure plays an important role in the relationship between property rights protection and firm leverage. In particular, post-enactment, interest-bearing debt ratios increase as private ownership in the firm increases. This is consistent with the notion that pre-enactment, private firms are financially more constrained than state-owned enterprises. Post-enactment, creditor rights, as well as private business profits, are better protected. This finding is important in that it provides empirical support for the effectiveness of the Law in encouraging lending to private businesses.

Second, we find that small firms experience a bigger leverage increase than large firms following the Law's passage. Smaller firms have fewer tangible assets, fewer political connections, and generally more financial constraints than large firms. Beck et al. (2005) find that small firms encounter more business obstacles (financial, legal and corruption) than large firms. When institutional developments weaken these constraints, small firms benefit more than their larger counterparts.

Third, we also document that the effect of the Law on capital structure varies with firm asset tangibility. Pre-enactment, firms with low asset tangibility are more financially constrained than those with high tangibility, since creditors mainly focused on a firm's fixed assets that could be collateralized. In the post-enactment period, with the enhanced creditor rights protection, lenders look beyond asset tangibility and give more weights to business history and/or project merits. As a result, low tangibility firms experience a bigger leverage increase.

In conclusion, our study adds novel and comprehensive evidence to the growing literature on the paramount importance of the institution of property rights protection in shaping business decisions, complimenting JMW (2002) and Cull and Xu (2005), among others. In particular, we find that secure property rights protection has important implications for firm capital structure choices, one of the most consequential corporate decisions.

## References

- Acemoglu, D., Johnson, S. and Robinson, J. A., 2001. Institutions as the fundamental cause of long-run economic growth. In: Aghion, Philippe, Durlauf, Stephen (Eds.), *Handbook of Economic Growth*, North Holland.
- Agrawal, A.K. and Madsen, D.A., 2013. Labor unemployment risk and corporate financing decisions. *Journal of Financial Economics* 108, 449-470.
- Allen, F., Qian, J. and Qian, M., 2005. Law, finance, and economic growth in China. *Journal of Financial Economics* 77, 57-116.
- An, Z., 2013. Private property rights, investment patterns, and asset structure. *Economics & Politics*, 25, 481-495.
- Acharya, V. and Xu, Z., 2017. Financial dependence and innovation: The case of public versus private firms. *Journal of Financial Economics* 124, 223-243.
- Bai, C.E., Lu, J. and Tao, Z., 2006. The multitask theory of state enterprise reform: Empirical evidence from China. *The American Economic Review* 96, 353-357.
- Beck, T., Demirgüç - Kunt, A. and Maksimovic, V., 2005. Financial and legal constraints to growth: does firm size matter? *The Journal of Finance* 60, 137-177.
- Berkowitz, D., Lin, C. and Ma, Y., 2015. Do property rights matter? Evidence from a Property Rights Law enactment. *Journal of Financial Economics* 116, 583-593.
- Booth, L. Aivazian, V.A., Demirgüç - Kunt, A., and Maksimovic V., 2001. Capital structure in developing countries. *Journal of Finance* 56, 87-130.
- Borisova, G., Fotak, V., Holland, K. and Megginson, W. L., 2015. Government ownership and the cost of debt: Evidence from government investments in publicly traded firms. *Journal of Financial Economics*, 118(1), 168-191.
- Borisova, G. and Megginson, W., 2011. Does government ownership affect the cost of debt? Evidence from privatization. *Review of Financial Studies* 24, 2693-2737.
- Campello, M., Graham, J. R. and Harvey, C. R., 2010. The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics* 97, 470-487.
- Cerqueiro, G., Ongena, S. and Roszbach, K., 2016. Collateralization, bank loan rates, and monitoring. *The Journal of Finance* 71, 1295-1322.
- Chen, Y., Liu, M. and Su, J., 2013. Greasing the wheels of bank lending: Evidence from private firms in China. *Journal of Banking & Finance* 37, 2533-2545.
- Chen, J., Jiang, C. and Lin, Y., 2014. What determine firms' capital structure in China? *Managerial Finance* 40, 1024-1039.
- Claessens, S. and Laeven, L., 2003. Financial development, property rights, and growth. *Journal of Finance* 58, 2401-2435.
- Cull, R. and Xu, L. C., 2005. Institutions, ownership, and finance: The determinants of profit reinvestment among Chinese firms. *Journal of Financial Economics* 77, 117-146.
- Djankov, S., Hart, O., McLiesh, C. and Shleifer, A., 2008. Debt enforcement around the world. *Journal of Political Economy* 116, 1105-1150.
- Ellis, I. and Jarboe, K., 2010. Intangible assets in capital markets. *Intellectual Asset Management* (May/June), 56-62.

- Faccio, M. and Xu, J., 2015. Taxes and capital structure. *Journal of Financial and Quantitative Analysis* 50, 277-300.
- Fan, G. and Wang, X., 2009. *NERI Index of Marketization of China's Provinces*. Economic Science Press, Beijing.
- Fazzari, S., Hubbard, R. G. and Petersen, B., 1988. Investment, financing decisions, and tax policy. *American Economic Review* 78, 200-205.
- Firth, M., Lin, C., Liu, P. and Wong, S.M.L., 2009. Inside the black box: Bank credit allocation in China's private section. *Journal of Banking & Finance* 33, 1144-1155.
- Frank, M. and Goyal V., 2009. Capital structure decisions: Which factors are reliably important? *Financial Management* 38, 1-37.
- Gao, H., Harford, J. and Li, K., 2013. Determinants of corporate cash policy: Insights from private firms. *Journal of Financial Economics* 109, 623-639.
- Gao, H., Harford, J. and Li, K., 2017. CEO turnover–performance sensitivity in private firms. *Journal of Financial and Quantitative Analysis* 52, 583-611.
- Garnaut, R., Son, L. and Fang, C., 2018. *China's 40 Year of Reform and Development: 1978-2018*. ANU Press, July 2018.
- Ge, J., Stanley, L. J., Eddleston, K. and Kellermanns, F. W., 2017. Institutional deterioration and entrepreneurial investment: The role of political connections. *Journal of Business Venturing* 32, 405-419.
- Girardi, D. and Bowles, S., 2018. Institution shocks and economic outcomes: Allende's election, Pinochet's coup and the Santiago stock market. *Journal of Development Economics* 134, 16-27.
- Graham, J. R., Leary, M. T. and Roberts, M. R., 2015. A century of capital structure: The leveraging of corporate America. *Journal of Financial Economics*, 118(3), 658-683.
- Huang, M. F., 2012. *Annual Report of Nonstate-Owned Economy in China (2011-2012)*, November. Beijing, China: Social Sciences Academic Press.
- Jefferson, G. and Rawski, T., 2002. China's emerging markets for property rights: Theoretical and empirical perspective. *Economics of Transition* 10, 585-617.
- Johnson, S., McMillan, J. and Woodruff, C., 2002. Property rights and finance, *American Economic Review* 92, 1335-1356.
- Kaplan, S. N., and Zingales, L., 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints? *Quarterly Journal of Economics* 112, 169-215.
- Knack, S., Keefer, P., 1995. Institutions and economic performance: Cross-country tests using alternative institutional measures. *Economics and Politics* 7, 207-227.
- Kusnadi, Y., Yang, Z. and Zhou, Y., 2015. Institutional development, state ownership, and corporate cash holdings: Evidence from China. *Journal of Business Research* 68, 351-359.
- La Porta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R. W., 1998. Law and finance. *Journal of Political Economy* 106, 1113-1155.
- La Porta, R., Lopez de Silanes, F. and Shleifer, A., 2008. Economic consequences of legal origins. *Journal of Economic Literature* 46, 285-332.
- Li, K., Yue, H. and Zhao, L., 2009. Ownership, institutions, and capital structure: Evidence from China. *Journal of Comparative Economics* 37, 471-490.

- Li, L., Willett, T. D. and Zhang, N., 2012. The effects of the global financial crisis on China's financial market and macro-economy. *Economics Research International* 2012, 1-6.
- Lim, S. C., Macias, A. J. and Moeller, T., 2014. Intangible assets and capital structure. *Baylor University working paper*.
- Lin, C., Lin, P. and Song, F., 2010. Property rights protection and corporate R&D: Evidence from China. *Journal of Development Economics* 93, 49-62.
- Loumioti, M., 2012. The use of intangible assets as loan collateral. *Working paper*, University of Southern California.
- Lu, Y., Png, I. P.L. and Tao, Z., 2013. Do institutions not matter in China? Evidence from manufacturing enterprises. *Journal of Comparative Economics* 41, 74-90.
- McMillan, J., 1997. "Markets in Transition," in Kreps, D. and Wallis, K., 1997. *Advances in Economics and Econometrics: Theory and Applications*. Cambridge University Press, 1997, pp. 210-239
- Mc Namara, A., Murro, P. and O'Donohoe, S., 2017. Countries lending infrastructure and capital structure determination: The case of European SMEs. *Journal of Corporate Finance* 43, 122-138.
- Meggison, W. and Netter, J., 2001. From state to market: A survey of empirical studies on privatization. *Journal of Economic Literature* 39, 321-389.
- Meggison, W., Ullah, B. and Wei, Z., 2014. State ownership, soft-budget constraints, and cash holdings: Evidence from China's privatized firms. *Journal of Banking & Finance* 48, 276-291.
- Myers, S. C. and Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not. *Journal of Financial Economics* 13, 187-221.
- Öztekin, Ö., 2015. Capital structure decisions around the world: Which factors are reliably important? *Journal of Financial and Quantitative Analysis* 50, 301-323.
- Petersen, M. and Rajan, R. G., 1994. The determinants and implications of corporate cash holdings. *Journal of Financial Economics* 52, 3-46.
- Shleifer, A. and Vishny, R.W., 2002. *The Grabbing Hand: Government Pathologies and Their Cures*. Harvard University Press.
- Simintzi, E., Vig, V. and Volpin, P., 2015. Labor protection and leverage. *Review of Financial Studies* 28, 560-591.
- Titman, S. and R. Wessels, 1988. The determinants of capital structure choice. *Journal of Finance* 43, 1-19.
- Yueh, L., 2011. *Enterprising China: Business, Economic, and Legal Developments Since 1979*. Oxford University Press.
- Wei, Z., Xie, F. and Zhang, S., 2005. Ownership structure and firm value in China's privatized firms: 1991–2001. *Journal of financial and quantitative analysis* 40, 87-108.
- Zhang, M., 2008. From public to private: The newly enacted Chinese Property Rights Law and the protection of property rights in China. *Berkeley Bus. LJ* 5, p.317.
- Zwick, E. and Mahon, J., 2017. Tax policy and heterogeneous investment behavior. *American Economic Review* 107, 217-48.

**Table 1. Summary Statistics**

Our sample includes all firm-years in CSMAR's non-listed firms' database during the 2004-2009 period subject to the twin requirements of sales greater than RMB 1 million and full-time employees greater than 20. The non-listed firms' database includes only manufacturing firms. Panel A reports descriptive statistics, Panel B reports univariate tests of leverage measures pre- and post-enactment of the Property Rights Law, and Panel C reports Pearson correlation coefficients.

LEV is total liability over book assets. AP is accounts payable over book asset. DEBT is total liabilities minus accounts payable, then scaled by book assets. LTD is long-term liability over book assets. ASSETS is book assets in thousands of RMB. FA is fixed assets over book assets. AGE is the establishment years of a firm. ROA is operating profit over assets. Growth is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). PRIVATE is the percentage of non-state and non-collective ownership shares.

**Panel A: Summary statistics of key variables**

Variable	Mean	1st Quartile	Median	3rd Quartile	Std. Dev.	N
	<b>Unlisted Firms, Manufacturing</b>					
LEV	0.56	0.37	0.58	0.76	0.27	629,161
AP	0.16	0.02	0.10	0.23	0.18	629,161
DEBT	0.41	0.19	0.39	0.59	0.26	629,161
LTD	0.04	0.00	0.00	0.01	0.11	629,161
Assets (in million RMB)	81.43	9.15	20.72	55.81	213.10	629,163
Ln_Assets	17.02	16.03	16.85	17.84	1.39	629,159
FA	0.34	0.17	0.31	0.49	0.22	629,161
Firm_Age	2.16	1.79	2.20	2.56	0.71	629,164
ROA	0.10	0.01	0.04	0.12	0.20	629,161
Growth	0.30	-0.06	0.13	0.40	0.90	573,251
POST	0.50	0.00	0.00	1.00	0.50	629,221
Private	0.89	1.00	1.00	1.00	0.29	628,554

**Panel B: Univariate test of capital structure measures**

Significance of pre- versus post-enactment mean difference is based on t-test statistics.

	Pre-enactment	Post-enactment	Mean difference
<b>Unlisted Firms, Manufacturing</b>			
LEV	0.571	0.558	-0.013***
AP	0.164	0.153	-0.011***
DEBT	0.407	0.406	-0.001*
LTD	0.045	0.041	-0.003***

Panel C: Correlation coefficient matrix

Correlations significant at least at the 10% level are shown in bold font.

<b>Unlisted Firms, Manufacturing</b>										
	<b>LEV</b>	<b>AP</b>	<b>DEBT</b>	<b>LTD</b>	<b>Ln_ASSETS</b>	<b>FA</b>	<b>Ln_AGE</b>	<b>ROA</b>	<b>GROWTH</b>	<b>POST</b>
AP	<b>0.37</b>									
DEBT	<b>0.77</b>	<b>(0.30)</b>								
LTD	<b>0.20</b>	<b>(0.12)</b>	<b>0.29</b>							
Ln_ASSETS	<b>0.02</b>	<b>(0.07)</b>	<b>0.07</b>	<b>0.15</b>						
FA	<b>(0.18)</b>	<b>(0.24)</b>	<b>(0.02)</b>	<b>0.21</b>	<b>0.05</b>					
Ln_AGE	<b>0.03</b>	<b>(0.06)</b>	<b>0.07</b>	<b>0.09</b>	<b>0.22</b>	<b>(0.03)</b>				
ROA	<b>(0.27)</b>	<b>(0.13)</b>	<b>(0.19)</b>	<b>(0.04)</b>	<b>(0.15)</b>	<b>0.10</b>	<b>(0.04)</b>			
GROWTH	<b>(0.02)</b>	<b>(0.01)</b>	<b>(0.01)</b>	<b>0.01</b>	<b>0.02</b>	<b>0.05</b>	<b>(0.13)</b>	<b>0.16</b>		
POST	<b>(0.02)</b>	<b>(0.03)</b>	<b>(0.00)</b>	<b>(0.02)</b>	<b>0.12</b>	<b>(0.03)</b>	<b>0.24</b>	<b>0.08</b>	<b>(0.10)</b>	
PRIVATE	<b>(0.04)</b>	<b>0.06</b>	<b>(0.08)</b>	<b>(0.15)</b>	<b>(0.11)</b>	<b>(0.08)</b>	<b>(0.30)</b>	<b>0.06</b>	<b>0.02</b>	<b>0.02</b>

**Table 2. Property Rights Law and Capital Structure**

This table reports regression results of firm capital structure changes surrounding the enactment of China's 2007 Property Rights Law. LEV is total liability over book assets. AP is accounts payable over book asset. DEBT is total liabilities minus accounts payable, then scaled by book assets. LTD is long-term liability over book assets. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). Ln\_ASSETS is the natural log of book assets in thousands of RMB. FA is fixed assets over book assets. Ln\_AGE is the natural log of firm age in years. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1. In all regressions, we include firm fixed effects. Standard errors, clustered at the firm level, are reported in parentheses. Significance levels at 1%, 5% and 10% are denoted by \*, \*\* and \*\*\* respectively.

**Unlisted Manufacturing Firms**

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)
Post	-0.0114*** (0.0007)	-0.0056*** (0.0005)	-0.0052*** (0.0007)	-0.0041*** (0.0003)
Ln_Assets	-0.0082*** (0.0011)	-0.0126*** (0.0007)	0.0038*** (0.0011)	0.0056*** (0.0004)
FA	-0.1442*** (0.0034)	-0.0797*** (0.0021)	-0.0633*** (0.0033)	0.0342*** (0.0015)
Ln_Age	0.0149*** (0.0014)	0.0003 (0.0009)	0.0149*** (0.0014)	0.0012* (0.0006)
ROA	-0.1268*** (0.0029)	-0.0284*** (0.0018)	-0.0976*** (0.0029)	-0.0029** (0.0012)
Growth	0.0042*** (0.0004)	0.0034*** (0.0003)	0.0008** (0.0004)	0.0005*** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	573240	573240	573240	573240
R2	0.75	0.67	0.70	0.66

**Table 3. Property Rights Law, Asset Tangibility and Capital Structure**

This table reports the DID regression results of the impact of asset tangibility on the Property Rights Law-capital structure relation. LEV is total liability over book assets. AP is accounts payable over book asset. DEBT is total liabilities minus accounts payable, all scaled by book assets. LTD is long-term liability over book assets. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). Ln\_ASSETS is the natural log of book assets in thousands of RMB. FA is fixed assets over book assets. Ln\_AGE is the natural log of firm age in years. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1.

Asset tangibility is measured by FA in Panel A, and by tercile dummies based on 2006 FA in Panel B. FA\_Low and FA\_Mid are dummies equal to 1 if a firm is in the lowest or the middle tercile of firm tangibility, respectively, and 0 otherwise. In all regressions, we include firm fixed effects. Standard errors, clustered at the firm level, are reported in parentheses. Significance levels at 1%, 5% and 10% are denoted by \*, \*\* and \*\*\* respectively.

**Unlisted Manufacturing Firms**

Panel A: Using continuous asset tangibility measure, FA

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)
FA*POST	-0.0129*** (0.0028)	0.0183*** (0.0019)	-0.0321*** (0.0029)	-0.0126*** (0.0014)
POST	-0.0070*** (0.0012)	-0.0119*** (0.0009)	0.0058*** (0.0012)	0.0002 (0.0005)
Ln_ASSETS	-0.0081*** (0.0011)	-0.0127*** (0.0007)	0.0039*** (0.0011)	0.0056*** (0.0004)
FA	-0.1363*** (0.0037)	-0.0909*** (0.0024)	-0.0436*** (0.0037)	0.0420*** (0.0017)
Ln_AGE	0.0149*** (0.0014)	0.0004 (0.0009)	0.0148*** (0.0014)	0.0011* (0.0006)
ROA	-0.1263*** (0.0029)	-0.0292*** (0.0018)	-0.0963*** (0.0029)	-0.0024** (0.0012)
GROWTH	0.0041*** (0.0004)	0.0034*** (0.0003)	0.0007* (0.0004)	0.0004** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	573240	573240	573240	573240
R2	0.75	0.67	0.70	0.66

Panel B: Using FA tercile dummies as tangibility measures

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)
FA_Low	-0.0039 (0.0027)	0.0043** (0.0018)	-0.0086*** (0.0027)	-0.0007 (0.0012)
FA_Mid	-0.0063*** (0.0019)	0.0016 (0.0012)	-0.0081*** (0.0019)	-0.0006 (0.0009)
FA_Low*POST	0.0068*** (0.0017)	-0.0113*** (0.0013)	0.0195*** (0.0018)	0.0089*** (0.0009)
FA_Mid*PPOST	0.0083*** (0.0015)	-0.0059*** (0.0009)	0.0146*** (0.0015)	0.0064*** (0.0008)
POST	-0.0175*** (0.0014)	0.001 (0.0008)	-0.0186*** (0.0014)	-0.0098*** (0.0008)
Ln_ASSETS	-0.0083*** (0.0011)	-0.0132*** (0.0007)	0.0056*** (0.0010)	0.0055*** (0.0004)
FA	-0.1474*** (0.0036)	-0.0763*** (0.0022)	-0.0714*** (0.0035)	0.0322*** (0.0016)
Ln_AGE	0.0150*** (0.0014)	0.0006 (0.0009)	0.0135*** (0.0013)	0.0012* (0.0006)
ROA	-0.1264*** (0.0029)	-0.0298*** (0.0018)	-0.0930*** (0.0028)	-0.0023** (0.0012)
GROWTH	0.0042*** (0.0004)	0.0035*** (0.0003)	0.0007* (0.0004)	0.0005** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	573237	573237	573237	573237
R2	0.75	0.67	0.70	0.66

**Table 4. Property Rights Law, Ownership and Capital Structure**

This table reports DID regression results of the impact of ownership on the Property Rights Law-capital structure relation. LEV is total liability over book assets. AP is accounts payable over book assets. DEBT is total liabilities minus accounts payable, then scaled by book assets. LTD is long-term liability over book assets. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). Ln\_ASSETS is the natural log of book assets in thousands of RMB. FA is fixed assets over book assets. Ln\_AGE is the natural log of firm age in years. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1.

We use two private ownership measures, i.e., the continuous percentage of private shares (Panel A) and private ownership dummy (Panel B). PRIVATE is the percentage of non-state and non-collective shares. PRIV\_DUM is a dummy equal to 1 if a firm has no state or collective ownership in the pre-enactment period and 0 otherwise. In all regressions, we include firm fixed effects. Standard errors, clustered at the firm level, are reported in parentheses. Significance levels at 1%, 5% and 10% are denoted by \*, \*\* and \*\*\* respectively.

**Unlisted Manufacturing Firms**

Panel A: Using the percentage of private shares, PRIVATE

	LEV (1)	AP (2)	DEBT (3)	LTD (4)
PRIVATE	0.0024 (0.0023)	0.0075*** (0.0015)	-0.0055** (0.0024)	-0.0043*** (0.0012)
PRIVATE*POST	-0.0031 (0.0020)	-0.0155*** (0.0013)	0.0131*** (0.0021)	0.0076*** (0.0011)
POST	-0.0086*** (0.0019)	0.0079*** (0.0012)	-0.0164*** (0.0019)	-0.0107*** (0.0011)
Ln_ASSETS	-0.0081*** (0.0011)	-0.0124*** (0.0007)	0.0037*** (0.0011)	0.0055*** (0.0004)
FA	-0.1441*** (0.0034)	-0.0795*** (0.0021)	-0.0634*** (0.0033)	0.0339*** (0.0015)
Ln_AGE	0.0151*** (0.0014)	0.0011 (0.0009)	0.0143*** (0.0014)	0.0008 (0.0006)
ROA	-0.1267*** (0.0029)	-0.0282*** (0.0018)	-0.0978*** (0.0029)	-0.0031*** (0.0012)
GROWTH	0.0042*** (0.0004)	0.0033*** (0.0003)	0.0009** (0.0004)	0.0005*** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	572823	572823	572823	572823
R2	0.75	0.67	0.70	0.66

Panel B: Using private ownership dummy, PRIV\_DUM

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)
PRIV_DUM	0.0016 (0.0021)	0.0071*** (0.0014)	-0.0058*** (0.0021)	-0.0052*** (0.0011)
PRIV_DUM*POST	-0.0033** (0.0016)	-0.0127*** (0.0011)	0.0098*** (0.0017)	0.0045*** (0.0009)
POST	-0.0085*** (0.0015)	0.0050*** (0.0010)	-0.0133*** (0.0016)	-0.0078*** (0.0008)
Ln_ASSETS	-0.0081*** (0.0011)	-0.0124*** (0.0007)	0.0036*** (0.0011)	0.0055*** (0.0004)
FA	-0.1441*** (0.0034)	-0.0795*** (0.0021)	-0.0634*** (0.0033)	0.0339*** (0.0015)
Ln_AGE	0.0151*** (0.0014)	0.0011 (0.0009)	0.0143*** (0.0014)	0.0009 (0.0006)
ROA	-0.1267*** (0.0029)	-0.0281*** (0.0018)	-0.0978*** (0.0029)	-0.0030** (0.0012)
GROWTH	0.0042*** (0.0004)	0.0033*** (0.0003)	0.0009** (0.0004)	0.0005*** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	572712	572712	572712	572712
R2	0.75	0.67	0.70	0.66

**Table 5. Property Rights Law, Firm Size and Capital Structure**

This table reports DID regression results of the impact of firm size on the Property Rights Law-capital structure relation. LEV is total liability over book assets. AP is accounts payable over book asset. DEBT is total liabilities minus accounts payable, then scaled by book assets. LTD is long-term liability over book assets. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). Ln\_ASSETS is the natural log of book assets in thousands of RMB. FA is fixed assets over book assets. Ln\_AGE is the natural log of firm age in years. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1.

In Panel A, firm size measure is Ln\_ASSETS. In Panel B, we use tercile dummies based on 2006 Ln\_ASSETS. Small and Middle are dummies equal to 1 if a firm belongs to the lowest or middle tercile, respectively, and 0 otherwise. In all regressions, we include firm fixed effects. Standard errors, clustered at the firm level, are reported in parentheses. Significance levels at 1%, 5% and 10% are denoted by \*, \*\* and \*\*\* respectively.

**Unlisted Manufacturing Firms**

Panel A: Using Ln\_ASSETS as the firm size measure

	LEV (1)	AP (2)	DEBT (3)	LTD (4)
Ln_ASSETS*POST	-0.0009** (0.0004)	0 (0.0003)	-0.0011** (0.0004)	-0.0022*** (0.0002)
POST	0.0048 (0.0070)	-0.0055 (0.0049)	0.0128* (0.0072)	0.0332*** (0.0035)
Ln_ASSETS	-0.0076*** (0.0011)	-0.0126*** (0.0007)	0.0044*** (0.0011)	0.0069*** (0.0004)
FA	-0.1443*** (0.0034)	-0.0797*** (0.0021)	-0.0634*** (0.0033)	0.0340*** (0.0015)
Ln_AGE	0.0149*** (0.0014)	0.0003 (0.0009)	0.0149*** (0.0014)	0.0010* (0.0006)
ROA	-0.1271*** (0.0030)	-0.0284*** (0.0018)	-0.0979*** (0.0029)	-0.0035*** (0.0012)
GROWTH	0.0042*** (0.0004)	0.0034*** (0.0003)	0.0008* (0.0004)	0.0004** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	573240	573240	573240	573240
R2	0.75	0.67	0.70	0.66

Panel B: Using Ln\_ASSETS tercile dummies as firm size measures

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)
Small	0.0038 (0.0039)	0.0022 (0.0027)	-0.0003 (0.0039)	0.0024 (0.0016)
Middle	0.0001 (0.0026)	0.0008 (0.0018)	-0.0019 (0.0026)	-0.0012 (0.0012)
Small*POST	0.0036* (0.0019)	0.0043*** (0.0014)	0.0007 (0.0020)	0.0067*** (0.0008)
Middle*POST	0.0032*** (0.0012)	-0.0007 (0.0008)	0.0049*** (0.0012)	0.0062*** (0.0006)
POST	-0.0134*** (0.0010)	-0.0052*** (0.0007)	-0.0084*** (0.0010)	-0.0081*** (0.0005)
Ln_ASSETS	-0.0082*** (0.0011)	-0.0131*** (0.0007)	0.0055*** (0.0011)	0.0054*** (0.0004)
FA	-0.1444*** (0.0034)	-0.0802*** (0.0021)	-0.0641*** (0.0032)	0.0339*** (0.0015)
Ln_AGE	0.0149*** (0.0014)	0.0006 (0.0009)	0.0135*** (0.0013)	0.0011* (0.0006)
ROA	-0.1271*** (0.0030)	-0.0293*** (0.0018)	-0.0944*** (0.0028)	-0.0034*** (0.0012)
GROWTH	0.0042*** (0.0004)	0.0034*** (0.0003)	0.0008* (0.0004)	0.0004** (0.0002)
Firm fixed effects	Yes	Yes	Yes	Yes
N	573237	573237	573237	573237
R2	0.75	0.67	0.70	0.66

**Table 6. Summary Statistics for Listed Manufacturing Firms**

This table reports summary statistics for listed firms. Our sample includes all firm-years in CSMAR' listed firms' database during the 2004-2009 period. As non-listed firms' database includes only manufacturing firms, we include only listed manufacturing firms for comparison purpose. LEV is total liability over book assets. AP is accounts payable over book asset. DEBT is total liabilities minus accounts payable, then scaled by book assets. LTD is long-term liability over book assets. ASSETS is book assets in thousands of RMB. FA is fixed assets over book assets. AGE is the establishment years of a firm. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). PRIVATE is the percentage of non-state and non-collective ownership shares.

<b>Variable</b>	<b>Mean</b>	<b>1st Quartile</b>	<b>Median</b>	<b>3rd Quartile</b>	<b>Std. Dev.</b>	<b>N</b>
LEV	0.55	0.39	0.52	0.64	0.33	5,246
AP	0.09	0.04	0.07	0.12	0.07	5,246
DEBT	0.44	0.30	0.43	0.55	0.20	5,246
LTD	0.08	0.00	0.03	0.11	0.11	5,235
ASSETS (million RMB)	1,301.00	979.10	1,619.00	1,619.00	442.50	5,246
Ln_ASSETS	20.89	20.70	21.21	21.21	0.54	5,246
FA	0.33	0.20	0.31	0.45	0.17	5,246
Ln_AGE	2.43	2.20	2.48	2.71	0.34	5,246
ROA	0.02	0.00	0.03	0.06	0.10	5,246
GROWTH	0.23	-0.01	0.14	0.31	0.73	5,166
POST	0.50	0.00	0.00	1.00	0.50	5,246
PRIVATE	0.73	0.51	0.73	1.00	0.25	4,914

**Table 7. Property Rights Law and Capital Structure for Listed Manufacturing Firms**

This table reports regression results of firm capital structure changes surrounding the enactment of China's 2007 Property Rights Law. LEV is total liability over book assets. AP is accounts payable over book asset. DEBT is total liabilities minus accounts payable, then scaled by book assets. LTD is long-term liability over book assets. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). Ln\_ASSETS is the natural log of book assets in thousands of RMB. FA is fixed assets over book assets. Ln\_AGE is the natural log of firm age in years. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1. In all regressions, we include firm fixed effects. Standard errors, clustered at the firm level, are reported in parentheses. Significance levels at 1%, 5% and 10% are denoted by \*, \*\* and \*\*\* respectively.

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)
POST	-0.0174** (0.0078)	-0.0024 (0.0023)	-0.0200*** (0.0051)	-0.0078** (0.0033)
Ln_ASSETS	-0.1097* (0.0648)	0.0065 (0.0074)	0.0212 (0.0228)	0.0312** (0.0141)
FA	0.2541*** (0.0855)	0.0192 (0.0167)	0.0946** (0.0374)	0.0472** (0.0227)
Ln_AGE	0.1746*** (0.0285)	0.0376*** (0.0071)	0.1038*** (0.0188)	0.0435*** (0.0121)
ROA	-0.8870*** (0.1072)	-0.0924*** (0.0193)	-0.5898*** (0.0429)	-0.0911*** (0.0231)
GROWTH	0.0134* (0.0070)	0.0057*** (0.0020)	0.006 (0.0044)	0.0053*** (0.0016)
Firm fixed effects	Yes	Yes	Yes	Yes
N	5166	5166	5166	5155
R2	0.84	0.81	0.84	0.73

### **Table 8. Asset Tangibility, Ownership and Firm Size Interactions for Listed Manufacturing Firms**

This table reports the DID regression results of the impact of asset tangibility, ownership and firm size on the Property Rights Law-capital structure relation. LEV is total liability over book assets. AP is accounts payable over book asset. Debt is total liabilities minus accounts payable, all scaled by book assets. LTD is long-term liability over book assets. POST is a dummy equal to 1 for the post-enactment period (2007-2009) and 0 for the pre-enactment period (2004-2006). Ln\_ASSETS is the natural log of book assets in thousands of RMB. FA is fixed assets over book assets. Ln\_AGE is the natural log of firm age in years. ROA is operating profit over assets. GROWTH is sales growth measured as sales in year t minus sales in year t-1, then dividend by sales in year t-1.

Asset tangibility, ownership and firm size are measured by FA, PRIVATE, and Ln\_ASSETS, respectively. In all regressions, we include the same set of firm control variables and firm fixed effects as we do in unlisted firms regressions. Standard errors, clustered at the firm level, are reported in parentheses. Significance levels at 1%, 5% and 10% are denoted by \*, \*\* and \*\*\* respectively.

---

	LEV	AP	DEBT	LTD
	(1)	(2)	(3)	(4)

---

**Panel A: Property Rights Law, Asset Tangibility and Capital Structure**

FA*POST	0.0113 (0.0399)	-0.0101 (0.0092)	0.0123 (0.0250)	-0.0235 (0.0190)
POST	-0.0213 (0.0161)	0.0011 (0.0043)	-0.0243** (0.0102)	0.0004 (0.0065)
Firm Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
N	5166	5166	5166	5155
R2	0.84	0.81	0.84	0.73

---

**Panel B: Property Rights Law, Ownership and Capital Structure**

PRIVATE*POST	-0.0225 (0.0251)	-0.0136* (0.0071)	-0.0301 (0.0184)	-0.0023 (0.0122)
POST	0.0029 (0.0172)	0.0078 (0.0051)	0.0042 (0.0137)	-0.0068 (0.0099)
Firm Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
N	4838	4838	4838	4827
R2	0.82	0.80	0.83	0.73

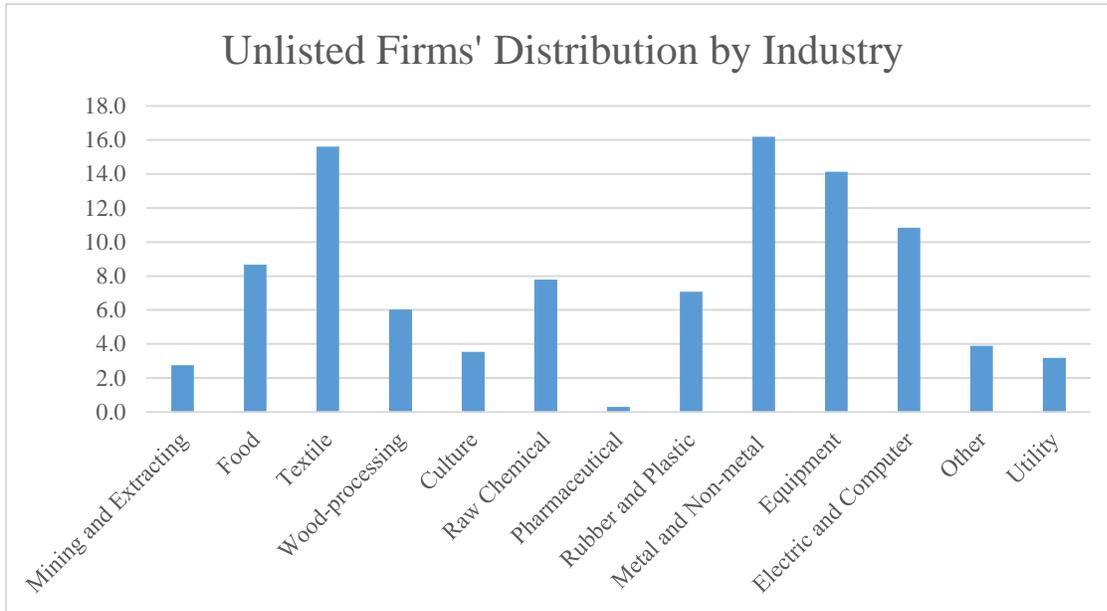
---

**Panel C: Property Rights Law, Firm Size and Capital Structure**

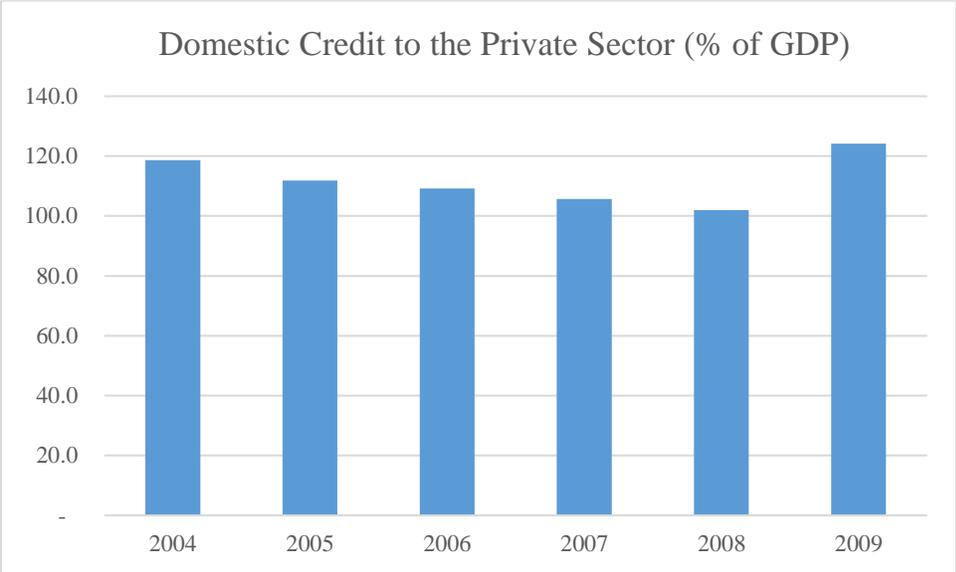
Ln_ASSETS*POST	0.0377 (0.0333)	0.0025 (0.0062)	0.0281** (0.0111)	0.0117 (0.0071)
POST	-0.8049 (0.6989)	-0.0545 (0.1299)	-0.6059*** (0.2321)	-0.2514* (0.1493)
Firm Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
N	5166	5166	5166	5155
R2	0.84	0.81	0.84	0.73

---

**Figure 1. Firm Distribution by Industry (%)**



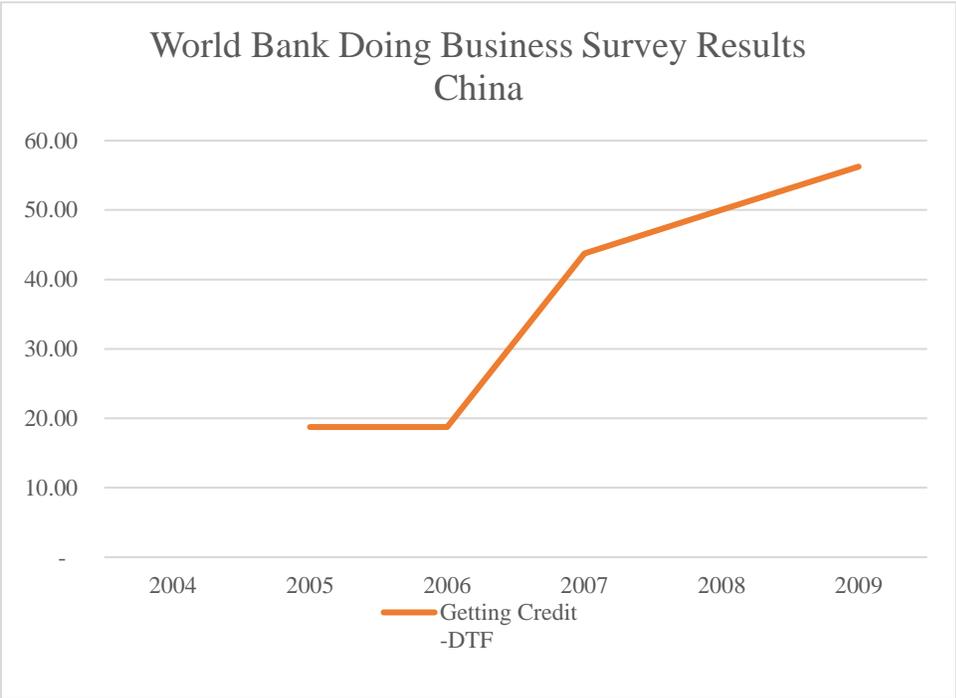
**Figure 2. China's Domestic Credit to the Private Sector: 2004-2009**



Data source: the World Bank

**Figure 3. China’s Doing Business Score of Getting Credit: 2004-2009**

According to the World Bank, getting credit measures each country’s “strength of credit reporting systems and effectiveness of collateral and bankruptcy laws in facilitating lending.” DTF stands for Distance to Frontier. According to World Bank: "An economy’s distance to frontier is reflected on a scale from 0 to 100, where 0 represents the lowest performance and 100 represents the frontier. "A higher score indicates that the regulatory performance of an economy improves.



Data source: the World Bank