

# Institutions, Ownership Structures, and Firm Distress Resolution<sup>1</sup>

Joseph P.H. Fan

Jun Huang

Ning Zhu

The Chinese University of  
Hong Kong

Shanghai University of  
Finance and Economics

SAIF and  
UC Davis

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## ABSTRACT

We investigate how institutional factors influence the behavior of distressed firms in emerging markets, where bankruptcy laws are often weak and debtors have greater bargaining power in distress. By studying two comprehensive samples of distressed firms in China, we find that local government quality and corporate ownership structure matter considerably to distressed firm performance. Distressed companies facing stronger institutional discipline and, with greater private ownership, display relatively better operating performance, more conservative capital structure, and higher ultimate recovery likelihood. Our results hold when we control the endogeneity of entering distress, employ different institutional proxies, and implement various definitions for distress.

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<sup>1</sup> Fan is with the Chinese University of Hong Kong and can be reached at [pjfan@cuhk.edu.hk](mailto:pjfan@cuhk.edu.hk) by e-mail or 852-2609-7839 by phone. Huang is with Shanghai University of Finance and Economics and can be reached at [sufejun@gmail.com](mailto:sufejun@gmail.com) by e-mail or 86-21-65904822 by phone; Zhu (corresponding author) is with University of California, Davis, and can be reached at [nzhu@ucdavis.edu](mailto:nzhu@ucdavis.edu) by e-mail and 530-752-3871 by phone. Part of the work was completed when Huang was visiting the Chinese University of Hong Kong and Zhu was visiting Beijing University. We greatly appreciate comments from Henry Cao, Stijn Claessens, Asli Demurguc-Kunt, Phil Dybvig, Jay Huang, Simon Johnson, Jun Liu, Garry Twite, Colin Xu, Harold Zhang, and seminar participants at Australian National University, Bankruptcy and Distress Resolution Conference (Brookings Institute China Conference), Cheung Kong Graduate School of Business, China International Finance Conference (Dalian), China Research Workshop of the Chinese University of Hong Kong, the International Monetary Fund, and the World Bank. Joseph Fan thanks the financial support from Hong Kong GRF grant (442608) and Ning Zhu thanks the financial support from National Natural Science Foundation of China (70972009 and 70932002). All remaining errors are ours only.

# Institutions, Ownership Structures, and Firm Distress Resolution

## **ABSTRACT**

We investigate how institutional factors influence the behavior of distressed firms in emerging markets, where bankruptcy laws are often weak and debtors have greater bargaining power in distress. By studying two comprehensive samples of distressed firms in China, we find that local government quality and corporate ownership structure matter considerably to distressed firm performance. Distressed companies facing stronger institutional discipline and, with greater private ownership, display relatively better operating performance, more conservative capital structure, and higher ultimate recovery likelihood. Our results hold when we control the endogeneity of entering distress, employ different institutional proxies, and implement various definitions for distress.

## 1. Introduction

Bankruptcy is arguably the most important outlet to resolve distress in developed markets. During the past decade, over 30,000 bankruptcy cases were filed with the U.S. Bankruptcy Court (American Bankruptcy Institute) each year, and thousands of cases were filed in the United Kingdom and continental Europe (Davydenko and Franks 2008). The possibility of ex-post bankruptcy and the associated costs weigh heavily on the ex-ante determination of firm capital structure and cost of capital (Modigliani and Miller 1958, Brealey and Myers 1996, Welch 1997, White 1984). Given its importance, scholars have devoted numerous studies to understanding bankruptcy and designing the optimal approach to resolve distress.<sup>2</sup> Despite the recent debate on the pros and cons of the liquidation-based (i.e. Chapter 7 in the United States) and the reorganization-based (i.e. Chapter 11 in the United States) approaches,<sup>3</sup> it is widely accepted in developed economies that the enforcement of bankruptcy laws and close external monitoring by stakeholders (i.e. corporate bond holders and large institutions) play important roles in disciplining financially distressed firms, influencing corporate financial decisions, and determining creditor recovery in the event of distress.<sup>4</sup>

The situations are different in emerging markets. First of all, the prevalent ‘soft lending’ practice in emerging markets (La Porta et al. 2000, Dinc 2005) provides easy and cheap access to capital for some companies, inducing corporate management to irresponsible budgeting and consequently disappointing performance and financial distress (Lin et al. 2008). Once companies get into distress, the weak legal enforcement and loose corporate governance environment in emerging markets make it complex to resolve such distress. Cross-country studies find that the actual use of bankruptcy law and the degree of creditor enforcement critically depend on a

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<sup>2</sup> For example, Baird et al. (2007), Bris et al. (2005, 2006), Franks and Torous (1989), Khal (2002), Stromberg (2000), Thorburn (2000), Weiss (1990), Wruck (1990), among others.

<sup>3</sup> Pulvino (1999), Shleifer and Vishny (1992), Weiss and Wruck (1998).

<sup>4</sup> Eckbo and Thorburn (2003), Gilson (1997), Hotchkiss (1995), Maksimovic and Phillips (1998).

country's institutional environment: the effectiveness of the judicial system (Claessens et al. 2003, Claessens and Klapper 2005), the protection of investor rights (Dahiya and Klapper 2007), and legal origin (Djankov et al. 2007).

Where institutional environments are weak, creditors often have difficulty in liquidating distressed firms or seizing distressed firm assets. Relationship banking, which normally helps monitor the debtor companies, may backfire during distress when banks face conflicts of interest and put securing their principal and interests from the debtor ahead of monitoring the debtor (Dinc 2005). Because of the weak public and private enforcement of creditors' rights in distress scenarios, debtors in emerging markets typically have greater bargaining power (Degryse and Ongena 2005, Petersen and Rajan 1994) than their counterparts in the developed markets.

In this study, we examine how corporate management reacts to financial distress in emerging markets and identify other forces that shape distressed companies' behavior when bankruptcy law alone fails to help creditors exert effective control over distressed companies. Given the extensive games played between stakeholders and the dynamic operating and financing decisions made during financial distress, distress events provide valuable opportunities to study how institutional forces influence corporate behavior.

In several significant ways, China is representative of many other emerging markets when it comes to distress and bankruptcy. First, China witnesses the common practice of soft lending in its banking sector. Such practice is known to distort interest rate setting and capital allocation and lead to corporate distress (Allen et al. 2005). Moreover, like their counterparts in other emerging markets (Khawaja and Mian 2005), Chinese companies with easy access to bank loans are prone to make imprudently aggressive investments that lead to subsequent distress (Lin et al. 2008, Luo et al. 2010). Further, because of government policy interventions and lack of laws and enforcement, distressed debtors in China often enjoy greater power than their

creditors, prolong the distress process, and cause large social deadweight losses. Overall, the weak bankruptcy law system in China provides a representative setting to examine how alternative institutional forces shape firm behavior in distress.

By using comprehensive data from the Annual Industrial Companies Database (Chinese National Bureau of Statistics (NBS), 1998–2005) that covers the universe of China’s state-owned enterprises (SOEs) and all large- and medium-sized non-SOEs firms in the manufacturing sector and a separate hand-collected dataset covering real default incidents at all Chinese listed companies, we aim to answer the above questions and understand how institutional backgrounds modify the behavior of distressed companies in context of an emerging market.

Our findings are summarized below. First, government quality strongly affects firm distress performance and resolution. Using various bureaucratic quality indicators in different provinces in China, we find that the distressed firms’ performances (measured by return on sales, total factor productivity, and earnings growth), capital structures, recovery likelihood, and the length of time needed to emerge from distress are all significantly affected by local government quality. For a distressed firm on the margin, a one-day increase in the entrepreneur’s time spent in a year dealing with government regulation (a proxy for lower government quality) results in 0.4 percent decrease in firm performance, 0.3percent increase in debt in the capital structure, 2.27 percent lower probability of recovery and 22 extra days needed to emerge from distress. These findings highlight the importance of bureaucrat quality when firm distress resolution depends on government arbitration rather than bankruptcy law enforcement, a practice common in developing economies.

Second, the ownership structure of the firm, another important institutional aspect, matters considerably to firm behavior in financial distress. Firms controlled by private parties are much less entrenched and much faster than state owned firms in adjusting their policies to deal with their financial distress. Distressed private firms

display significantly better performance than their SOE counterparts. For example, a one standard deviation increase in private ownership can increase return-on-sales by 2.8 percent for companies on the margin of distress. In terms of capital structure decisions, distressed private firms are less aggressive with their post-distress corporate financing policies, reflected by the relatively lower levels of debt that they keep. As a result, private firms on average emerge from financial distress more than one year sooner than SOEs and are 40 percent more likely to emerge from financial distress eventually. The effects of private ownership also show up in time-serial data. In fact, even a small increase in private ownership in a state-controlled firm can lead to a significant improvement in the firm's performance through distress.

Our main findings persist through a host of robustness tests. We conduct tests by focusing on both inferred distress by several measures including the Altman Z-value, leverage, and interest coverage, and real loan default events by employing a large number of proxies for other institutional factors. We implement various criteria for defining distress and different econometric specifications (pooled ordinary least squared (OLS) regressions, firm fixed-effect panel regressions, and change-in-change regressions). We endogenize the likelihood of different companies to enter distress in the first place, and split the data into various sub-samples. Our main results remain unchanged.

Finally, our analyses on the changes in firm behavior from pre- to post-distress periods confirm that our results are driven by the change in behavior of companies in distress, as opposed to an alternative possibility that we merely capture continuation of different firm behavior from the pre-distress period. Such results confirm that institutional factors not only explain the cross-sectional differences in average firm behavior but are particularly powerful in explaining how firms adapt their decisions throughout distress.

Our study makes several contributions to the extant literature. First, we are among the first to demonstrate how institutional factors shape distressed firms' decisions. The literature shows that a stronger institutional environment generally is beneficial to financial markets and corporate financing (La Porta et al. 1998, La Porta et al. 2002). However, under strong creditor protection, distressed companies with promise might be liquidated prematurely and going-concern value destroyed (Bris et al. 2006). Although poorer protection of creditor rights may result in delay in distress resolution, it may at times be favored by providing alternative institutional forces that effectively discipline the behaviors of the distressed firms.

In addition, because distress resolution heavily influences the availability and cost of capital, our new evidence on how local institutional environment influences distressed firm behavior complements the existing literature on how institutional factors influence finance (Claessens et al. 2003, Claessens and Klapper 2005, Dahiya and Klapper 2007, Djankov et al. 2007) and depicts a specific mechanism through which law and institution affect regional capital accessibility and corporate financing.

Finally, the paper provides novel evidence on distressed-firm behaviors in emerging markets, where the institutional environment is vastly different from those of developed economies. Consistent with Jensen's theory prediction on the disciplinary role of financial distress (Jensen 1986), this paper finds that distressed firms indeed adjust their financial policy in order to recover, despite a lack of liquidation practice. In addition to existing findings that firm factors, such as capital structure (Booth et al. 2001, Ofek 1993), matter to the speed at which firms respond to distress, we show that institutional factors also determine firms' sensitiveness to distress and how they adapt their decisions in distress.

Our paper is closest to a recent paper by Davydenko and Franks (2008) that investigates how bankruptcy law influences lending and borrowing practices in a number of European countries. Our paper supports their study in that we find that the

legal environment around bankruptcy has important influences on how companies modify decisions and resolve distress. Our focus on the emerging markets also leads to several key distinctions from their study. First, unlike their focus on the differences in written law, we follow Djankov et al. (2007) and emphasize the enforcement and practice of law (i.e. the quality of government). One common feature of emerging markets is that factors other than the written law (such as legal enforcement, social norm, and business practices) are sometimes more important in shaping firm behavior. Related to this difference, our study focuses more on how a less formal institutional background (Allen et al. 2005, Ayyagari et al. forthcoming), such as block ownership and government quality, helps discipline distressed companies and facilitate distress resolution. Finally, in addition to relying on real default events, which are sometimes difficult to identify accurately in emerging markets given soft lending, we also rely on distress events that we infer from detailed financial information at firm level. Such a rich dataset not only allows us to study a wide spectrum of companies (from large state-owned listed companies to small local non-listed manufacturing companies) but also enables us to investigate different aspects of distressed firm behavior.

The rest of the paper proceeds as follows: Section 2 discusses the practice of bankruptcy in emerging markets and China in particular; Section 3 develops our testable hypotheses; Section 4 describes the data and outlines the empirical methodology; Section 5 presents our findings and discusses the results before we conclude in Section 6.

## **2. Distress and Bankruptcy in Emerging Markets**

### **2.1. Corporate bankruptcy in emerging markets**

In addition to the drastic differences in economic prosperity between emerging and developed markets, in their institutional environments differ fundamentally as well. On the legal front, La Porta et al. (1997, 1998) show that emerging markets typically witness weak protection of creditor rights and ineffective law enforcement. On the administrative side, governments in emerging markets tend to exert greater

influence on markets and firms, and the quality of bureaucrats cannot be assumed to be high (Shleifer and Vishny 1994). The prevalence of crony bank lending (Sapienza 2004, Khawaja and Mian 2005, Charumilind, Kali and Wiwattanakantang 2006) and weak corporate governance mechanisms at the micro level renders an unfriendly financing environment to entrepreneurs (Durnev et al. 2004).

In a comprehensive summary of bankruptcy practices around the world, Claessens and Klapper (2005) show that differences in institutional background lead to distinct utilization of bankruptcy laws across countries. In particular, more creditor rights and higher judicial efficiency enjoyed by most developed markets encourage the use of bankruptcy to resolve distress. Bankruptcy resolution, in contrast, is far less common in emerging markets because 1) some countries have no formal bankruptcy code, 2) contracts and protection of creditor rights in the event of default are weakly enforced even with the existence of a formal bankruptcy code, and 3) the judicial system is inexperienced with handling distress cases and protecting creditor claims in the event of default.

As a result, out-of-court bargaining (Gilson et al. 1990, Asquith et al. 1994) becomes the main method of default and distress resolution in emerging markets. As debtors normally enjoy an information advantage regarding company prospects and control over company assets, they command a greater level of bargaining power in distress resolution than their counterparts in developed markets.

## 2.2. Corporate bankruptcy in China

The bankruptcy law (trial implementation) in China was enacted in 1986 and lags considerably behind the practice of law in distress in many aspects (Law Year Book of China, 2001). Typical to many other emerging markets, the judicial system on bankruptcy is obsolete and law enforcement is weak (Allen et al. 2005, 2006). Judges and attorneys alike often are unable to find the specific clauses to cite in the law or law enforcement is lacking to carry out what the court rules. As a result, the court

system has been very conservative with bankruptcy-related petitions so as not to contradict the interpretation of the law. The court normally requires distressed firms to obtain consent to their bankruptcy decisions from the local government first and to propose a satisfactory plan to place its existing employees before even considering hearing the cases.<sup>5</sup>

Although the law indeed includes bankruptcy as one possible solution to resolve distress, liquidation and asset possession rarely happen in China. Instead, courts tend to be protective of SOEs and encourage workouts and restructuring so as to keep default firms as going concerns. As a result, only a small fraction of filed bankruptcy cases are handled by the court system and even fewer are discharged. Appendix I reports statistics of filed and discharged bankruptcy cases in China. On average, only about 7 percent of all bankruptcy petitions are handled by the court. For example, 315 out of 7,233 filed bankruptcy cases were handled by the court in 2001, with even fewer cases reaching the judges (Law Year Book of China, 1993–2001).

As in other markets, the practice of soft lending is common in China, especially between state-owned banks and SOEs. Such easy access to bank capital and a lack of effective monitoring leaves the borrower unchecked and induces distress.<sup>6</sup> Although outside our sample period, it is worth noting that the recent securitization of several major state-owned banks requires them to be more vigilant with their new lending and outstanding loan recovery. Recently, these banks have become more discerning with their loans and more watchful of debtors defaulting. In addition, these banks are now putting greater-than-ever pressure on distressed

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<sup>5</sup>“A Completely New Bankruptcy Law in Chinese History,” by Shengning Fu, Aug. 30, 2006, *Shenzhen Business Journal*.

<sup>6</sup> We later perform empirical analyses that explicitly control for the fact that SOEs are more likely to enter distress, and we obtain results consistent with our main findings.

companies to come up with satisfactory plans for their defaulted debts. However, the effects of the new development remain to be seen.

### **3. Hypothesis Development**

This section discusses ownership structure and government quality as key determinants of distressed firm behavior in China.

#### **3.1. Ownership structure**

Traditionally, Chinese banks cater primarily to the state sector. Government owned firms in China, like the rest of the world, establish their competitive edge through monopolistic market power, easy access to valuable bank loan financing, and favorable tax treatment (Dinc 2005, Johnson and Mitton 2003, Shleifer 1998, Shleifer and Vishny 1994). However, weak incentives and poor corporate governance often cripple SOEs' economic efficiency. In particular, executives of SOEs typically are evaluated on dimensions other than firm performance, such as contributions to local economic growth and employment, which distract them from optimizing firm performance and shareholders' wealth (Cull and Xu 2000).

Career concerns may provide China's distressed SOE managers some incentives to turn around their companies (Bai et al. 2000, Bai and Xu 2002). Many SOE executives are also government officials and their performance as managers may influence their future career promotion within the administrative system. However, SOE executives understand that banks provide favorable lending to their companies because of government pressures, and the banks are unlikely to terminate their lending relationships or engage in further punitive actions in the event of default. Even in some extreme cases, the executives can still hope for government bail-out, which is not available to private companies. In contrast, it is generally difficult for private sector entrepreneurs to obtain bank loans. If a private firm indeed was able to obtain a loan and later defaulted, it typically would not be salvaged by the

government and would face the risk of forced liquidation (Allen et al. 2005). Consequently, relative to private firm managers, SOE executives lack the urgency to improve firm performance or adjust corporate capital structure in response to financial distress.

Overall, we expect that the existing incentives and disciplines provided to SOE managers are less robust than those provided to managers of private ownership. Firms under private ownership are expected to adjust their strategies more effectively to repay debts (reflected by better firm performance and more conservative capital structure) and to be more likely to emerge from financial distress.

### 3.2. Government quality

Government quality influences the effectiveness of legal enforcement and hence the judicial system. Given that legal environments are critical to economies and financial markets at the macro-level (La Porta et al. 1998) and to firm-level decision-making (Demirguc-Kunt and Maksimovic 1996, 1998, 1999), the quality of government is important in firm behavior (Shelifer and Vishny 1994). The quality of government depends on the capability and talent not just of bureaucrats, but also whether the bureaucrats' incentives are well aligned with those of the citizens. Better government quality can provide better protection of lending contracts, pose greater liquidation threat to distressed firms, influence interest rate, and enhance credit availability to companies. In contrast, poor government quality creates gaps between written laws and enforcement and increases transaction costs (Briset et al. 2006, Charumilind et al. 2006, Durnev et al. 2004, La Porta et al. 1999, Ofek 1993).

Around the world, governments are instrumental in firm distress resolution, especially in strategic sectors such as finance and public utilities. The role of government is even more important in emerging markets. In China, in addition to influencing local bank branches on loan decisions to distressed firms, local governments influence local courts' attitudes of whether and how to handle

bankruptcy petitions and intermediate asset, loan, and ownership reorganizations in distress resolution processes.

Because of heavy government interventions, the efficiency of firm distress resolution in China depends critically on the quality of government intervention. We expect that firms subject to higher quality public governance respond more quickly to financial distress (reflected by relatively better operating performance, more conservative capital structure and a higher possibility of recovering from distress). In addition to government quality, we experiment with a host of other proxies for institutional quality in various regions of China and obtain very consistent results. We discuss such findings in Section 5.4 to strengthen our argument.

### 3.3. Testable hypotheses

Summarizing our above discussions on how state ownership and government quality can influence distressed firm behavior, we formulate the following testable hypotheses:

**Hypothesis 1.** Better institutional background helps improve distressed firms' operating performances.

**Hypothesis 2:** Better institutional background motivates firms to be more responsive and steers distressed firms toward more responsible (conservative) capital structure.

Partly reflecting the consequence of the above hypotheses, we expect that firms located in regions with better institutional background to have a greater chance of recovering from financial distress and, if they do, recover sooner than firms governed by poorer institutional background. We formally formulate this in the following hypothesis:

**Hypothesis 3:** Better institutional background helps distressed firms emerge from distress.

## **4. Empirical Design**

### **4.1. Data**

This study uses two distinct data sources. First, we use the Annual Industrial Companies Database of the Chinese National Bureau of Statistics (NBS). The database covers financial, ownership and operating information of: 1) all SOEs regardless of their annual sales, and 2) all non-SOE firms (including domestic private firms, joint ventures, and foreign firms) with annual sales of at least RMB 5 million (almost US\$600,000, according to the exchange rate on Dec. 31, 2005). The data source covers the period of 1998 to 2005, with the number of firms ranging from 162,033 to 271,835 across the sample years and encompasses firms in all provinces in mainland China.<sup>7</sup> All (about 700) publicly-listed industrial firms are included in the database. The database has increasingly been used for academic research with reasonable quality and good representation of the national economy (Chow 1993, Chuang and Hsu 2004, Li et al. 2006).

In addition, we hand collect real loan default information from annual reports of most companies publicly listed in China during 2000 through 2007. The sample complements the NBS samples and findings that are based on inferred distress. More description is provided in the subsections below.

### **4.2. Classifying distress**

We adopt two approaches to classifying financial distress. The first approach is by inference, whereas the second is based on actual default events.

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<sup>7</sup> Some firms may change their identification number due to exit from and re-enter into the NBS dataset (Jefferson et al. 2002). We use only observations with consistent identification numbers and those that have data for the entire sample period.

#### 4.2.1. Inferred distress

Our main approach is to identify distress within the first three years of our sample (1998–2000)<sup>8</sup> and track the dynamics of distressed firm behavior between 2001 and 2005.<sup>9</sup>To be thorough, we adopt several measures to classify distressed companies. Our primary criterion is the widely-used Z-score, modified for emerging market companies (Altman, et al. 1995,Altman2000). Following the literature, we estimate the Z-score for each NBS firm within each of the first three sample years.

In addition to the Z-score of each company, we also generate a distress dummy variable that defines a firm to be ‘distressed’ if a company’s Z-value falls below a cut-off value in at least two consecutive years (1998 and 1999, 1999 and 2000, or 1998 through 2000). Appendix II provides details of how we estimate the Z-score and set the cut-off value. Separately, we include all companies that stayed out of distress during the entire sample period(1998 to 2005) as the control sample. The distressed companies and control companies make up our entire match sample of firms (referred to as ‘match sample’ when we present results). The match-sample approach has the advantage of focusing sharply on distressed and healthy companies.

To account for differences in the Chinese economy and that of other emerging markets, we experiment with several alternative definitions for distressed and control firms. For example, we use different sets of cut-off Z-values to define distressed companies. In addition, we experiment with focusing on only ‘slightly-distressed’ firms, those firms whose Z-values are slightly below the cut-off value and are very likely to recover from distress, so as to gain a sharper focus on companies potentially sensitive to our classification criteria. Further, we require a firm to be distressed in all three years of the first three-year period in an alternative definition. We also use alternative selection criteria for control firms (i.e. requiring the firms to stay out of

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<sup>8</sup> We experiment with several different cut-off years, and our results are highly robust.

<sup>9</sup> Except for the East Asia financial crisis in the late 1990s, the Chinese economy experienced little negative shock and grew at a brisk pace of over 9 percent annually during the sample period.

financial distress between 1998 and 2000, instead of the entire 1998–2005 period) and experiment using different numbers of years of performance to define distress. We obtain similar results using these alternative definitions and, to conserve space, do not tabulate the results.

To alleviate the concern that the match-sample approach is sensitive to the choice of distress criteria, we alternatively perform analysis using actual Z-scores (the continuous variable) of all firms that have data for the entire sample period in the NBS database (referred to as ‘full sample’ when we present results). Our alternative sample definitions and ‘default’ definition generate very similar results.

In addition to the Z-score measure, we use two other criteria to infer distress: leverage and interest coverage. With leverage, we consider a firm to be in distress if the leverage of a firm is greater than one (that is, a firm has more total outstanding debts than its total assets). With the interest coverage measure, we classify a firm to be in distress if its interest coverage ratio is less than one (that is, a firm’s operating incomes is not enough to cover its interest payment obligations). We then construct distressed and control samples as above, and find that the two alternative classifications generate similar results to our main results. To conserve space, these results are not tabulated.

#### 4.2.2. Real default events

Even with the above robustness checks, there still might be a concern that the method of inferred distress does not help identify most of the firms that are actually distressed. To address the potential limitation, we collect a separate sample of loan default events of publicly listed companies. We go through the annual reports of all listed companies in China (shares being listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange) to identify companies that defaulted on their short-

term and long-term loans.<sup>10</sup> We exclude 34 firms with missing loan default information, 27 firms that do not have a full period of financial information due to delisting, and 246 firms listed before 1995 (because of huge changes in the IPO process since then). These selection criteria results in a total of 932 firms in the sample.

To make sure that we include companies that really are financially distressed, we define a company to be in distress if it not only defaulted on its debts, but also reported negative net income in the same period.<sup>11</sup> Different from our practice with the NBS data, we use the 2000 to 2002 period (the first three years that such data became available) to define distressed firms. By the above criteria, we identify 38 distressed firms. The remaining 894 companies without any default loan during the entire sample period are used as the control sample.

The two samples/distress definitions complement each other in the following ways: 1) the listed-company sample documents *real* default events, whereas we observe *inferred* distress in the NBS sample, 2) the listed-company sample includes only large companies, whereas the NBS sample includes both large and smaller companies, 3) the listed-company sample encompasses a wide range of industries while the NBS sample includes only manufacturing industries, and 4) the NBS sample covers slightly different time periods and many more companies. Our results are robust within respective samples and provide strong support to our conjectures.

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<sup>10</sup> According to the legislation “The Standards on the Contents and Formats of Annual Reports of Listed Companies (1999),” the China Securities Regulatory Commission (CSRC) requires that listed companies disclose the information of default loans in annual reports starting from 2000.

<sup>11</sup> It might be the case that listed companies have unpaid loans not due to their inability to pay back the loans but due to lack of pressure from state lenders to pay them back. In this case, the loans are *de facto* government subsidies. Adding the condition of negative net income mitigates this possibility.

### 4.3. Regression methodology

Based on the discussions in Section 3, we next examine how institutional background modifies distressed firms' interim performances, financing decisions, and patterns of recovery from financial distress.

Our main empirical approach is to perform panel regression of firm behavior on the institutional factors. In particular, we investigate whether the interactions of the institutional background and the Z score (in the case of the NBS firm sample) or the default dummy variable (in the case of the listed company sample) exert significant impact on firm behavior, the dependent variables. We include both state ownership and government quality as separate independent variables in the regression. As a result, significant coefficients on the interaction variables between distress and institutional quality variables, in the expected sign, will provide support to our hypothesis that institutional background is even more important in shaping the behavior and performance of distressed firm than average firms. In addition to our main regressions, we also perform two-stage regressions to account for potential endogeneity due to some firms being more inclined to distress than others. In addition, we adopt change-in-change regression and alternative estimation methods and obtain consistent results. We discuss such results later in Section 5.4.

### 4.4. Variables

#### 4.4.1. Dependent variables

We are interested in the performance, capital structure, and recovery outcome of distressed firms. Appendix III provides a description of the variables.

Performance is measured as return on sales (ROS), total factor productivity (TFP), or earnings growth. To estimate a firm's TFP, we employ a two-factor Cobb-Douglas production function and regress the total sales of a company on two factors, labor and capital by industry and by year, all taking natural logarithm. We then employ the regression residual as the TFP of the firm.

Capital structure, or financial leverage, is defined as total liabilities divided by total assets. As discussed in Section 2, weak institutional background poses less pressure to distressed companies to promptly adapt their capital structures. By measuring the change in leverage through the sample years, we will understand how firms change the levels of debt, relative to their assets.

We adopt two variables to track recovery outcome for financially distressed firms. First, we trace each distressed firm's performance throughout the rest of the sample period. We create a dummy variable equal to one if the distressed firm is no longer distressed by our definition at the end of the sample period, 2005 for the NBS sample and 2007 for the listed company sample, and otherwise, zero.<sup>12</sup> We then estimate the hazard rate model using the dummy variable as the dependent variable, to examine which types of firms are more likely to emerge from distress at the end of our sample period. The hazard rate model specification addresses the fact that we have a five-year observation window for recovery and our observation of the ultimate recovery is truncated.

Separately, we count the number of years that a distressed company stays in distress from the beginning to the end of the investigation period. By construction, the minimum number of years is one (for example, a firm in the NBS sample emerges from distress in 2001 and has since stayed out of distress) and the maximum number of years is six (a firm stays in distress until the end of our sample period in 2005 for NBS sample or 2007 for the listed company sample). For firms flipping around distress verge, we calculate the time by looking at the last recovery. We adopt the Tobit regression approach to account for the fact that the data may be truncated due to the length of our sample period.

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<sup>12</sup> We experiment with alternative definitions that define a distressed company as in 'recovery from distress' if a company becomes 'healthy' for at least two consecutive years or at least three consecutive years after distress, and our results remain the same.

Table 1 provides summary statistics of key variables for both the NBS (in Panel A) and the publicly listed (in Panel B) samples. The publicly listed companies on average have better performance and lower leverage than the companies from the NBS database. Once in default, listed companies take less time to recover than do distressed firms in the NBS sample. These differences are expected, given listing requirements and potential government support of the publicly traded companies.

Panel C and D of Table 1 reports summary statistics contrasting the performance and capital structure of distressed versus non-distressed companies. Not surprisingly, the distressed companies report considerably lower operating performance and much higher levels of indebtedness than non-distressed companies. Some differences in company size or in tangible asset ratio also are evident, but the differences are economically small.

#### 4.4.2. Independent variables

On ownership structure, we include state ownership measured as the fraction of a firm's equity owned by government agencies. We perform additional analyses (unreported) by adopting a dummy variable that equals to one if state equity ownership in a company is no less than 50 percent, and zero otherwise. All our main results retain.<sup>13</sup> Next, the government quality measure, constructed by the World Bank (2006) and widely used in extant studies (Cai et al. 2007, Xin and Xu 2007, Fan et al., 2009), is defined as the percentage of days in a year that companies spend with government regulators, including regulators from tax, public security, environmental protection, labor and social security administrations.<sup>14</sup> Such a measure reflects how much time businesses have to spend on governmental relationships, or 'Guanxi.' In addition, we employ several other measures of governmental quality, including a

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<sup>13</sup> Such results are available from the authors upon request.

<sup>14</sup> The measure is at the city level, and we use the average value in all cities within a province as the province-level measure.

corruption variable based on local firm expenditures on eating, drinking and entertainment (World Bank 2006) and the bureaucrat quality index of the Annual Report of Urban Competitiveness in China (Social Science Academic Press 2003).<sup>15</sup> The results based on the alternative government quality measures are similar and, therefore, are not separately tabulated in the paper. To account for potential influences from institutional background change on distressed firm behavior, we also use the lagged state-ownership instead of the current year data, and results remain similar.

We include the following firm-level control variables in almost all regressions:

1) Z score in the beginning of distress or the default dummy variable (See Appendix II), 2) list — a dummy variable equal to one if a firm is publicly traded, and zero otherwise, 3) firm size — the logarithm of company book assets in thousands of RMB, 4) firm leverage — total liabilities divided by total assets, 5) tangible asset — the fraction of total tangible assets to total assets, and 6) firm age — the number of years that a firm has been in existence for the NBS sample or listed for the default sample. Following Gilson, John and Lang (1990), we employ the value of control variables at the beginning of distress to address the concern that these firm measures may change during the distress. In most regressions, we include year and industry fixed effects and cluster observations at the firm level.

## **5. Regression Results**

### **5.1. Operating performance**

Table 2 reports the performance regression results using the matched sample of distressed and non-distressed companies in the NBS database. In addition to the reported specifications in which we include all institutional variables in the same

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<sup>15</sup>The Chinese Academy of Social Sciences surveys the level of bureaucratization, the frequency of government expropriation, and the level of citizen satisfaction for 200 cities in China and employs a principal component analysis to arrive at a city-level index of government service quality. We use the mean value of the index levels of all cities within a province as the proxy for the provincial-level government quality.

regression, we also have tested specifications in which we include only one institutional variable at a time in the regression, and we obtain consistent and slightly stronger results.<sup>16</sup>

Consistent with prior studies, higher ownership by the state and poorer government quality indeed suggest poorer performance, reflected in the significantly negative coefficients on these two variables. More to the focus of the current paper, the coefficients on the interaction between Z score and state ownership, and on the interaction between Z score and government quality, also are significantly negative. These results are economically significant. For a company on the margin of distress, (Z score equal to zero), a one standard deviation increase in private ownership ratio can increase return-on-sales by about 2.8 percent, and a one standard deviation improvement in government quality leads to a 1.6 percent increase in operating performance for an average distressed firm. In addition, the results based on the two alternative measures of firm performance, total-factor-productivity (TFP) and earnings growth, are similar to those based on return-on-sales.

Table 3 reports the ‘full-sample’ results that include all companies in the NBS database (as opposed to the ‘match sample’ results that include default and control companies) and shows that the results are quite similar. In particular, the coefficients on the interactions between Z score and institutional background variables remain significantly negative.

We next report the results using information on real default within the sample of listed companies in Table 4. The results are similar to those based on the NBS data. The coefficients of the interaction terms have the right signs, although their levels of statistical significance vary across the different performance measures possibly due to

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<sup>16</sup>Such results are available from the authors upon request.

the relatively small number of distressed firms. Overall, the results confirm that state ownership and government quality strongly affect distressed firm performance.

In sum, the above findings lend strong support to our hypothesis 1, that distressed firm performance is affected heavily by augmenting institutional factors where bankruptcy law is weak, and distressed companies perform relatively better when they are with higher private ownership and in a better institutional environment.

## 5.2. Financing decision

In addition to keeping their businesses running as usual, managers at distressed companies have to act fast to deal with liquidity constraints and demands made by various stakeholders. In particular, the managers have to make important financing decisions, which are critical to the survival and recovery of distressed firms.

The results based on the matched sample (Table 2) show that, consistent with our conjecture, companies with higher state ownership and those facing poorer government quality indeed take on more debts. Further, the coefficients on the interaction term between state ownership and Z score and on the interaction term between government quality and Z score are both significantly positive, suggesting that higher state ownership and poorer government quality is associated with abnormally higher financial leverage for firms in distress. The evidence is even more striking considering that higher quality governments provide better debt capacity to companies in distress than do poorer quality governments (Shleifer and Vishny 1992). Our evidence is again consistent with the argument that better government facilitates contract enforcement and creditor protection. As a result, distressed firms are more motivated to reduce their debts and improve their financial health.<sup>17</sup> Our

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<sup>17</sup> To address the possibility that the debts for distressed companies may come largely from accumulating interest payment obligations, we perform unreported analyses that subtract interest payment from the liability measures and repeat our main analyses. We obtain very similar results.

additional analyses using the full NBS data (Table 3) again generate consistent results with our matched-sample results.

As in Table 4, our results using the data of listed companies are consistent with those based on the NBS data. Overall, the analyses of actual defaults confirm our results using the inferred distress among the NBS companies.

### 5.3. Recovery from distress

The last two columns in Table 2 suggest that, other things constant, state ownership and poor government quality significantly reduce the likelihood that a firm emerges from distress by the end of our sample period. Such results are highly significant at the 1 percent level and also economically meaningful. One standard deviation change in state ownership and government quality can lead to a 17 and 9 percent change in firms' recovery probability, respectively. Similar to our results on recovery probability, lower state ownership (or more private ownership) reduces the length of time it takes a firm to emerge from distress, while a firm residing in a location of better quality government takes less time to emerge, consistent with the above findings on recovery probability. The results, taken together with our previous results on firm decisions, indicate that better institutional background provides greater incentives for firms to take the proper turn-around strategy and that firms are more likely to obtain the objective of improving business and successful restructuring.<sup>18</sup>

In summary, the above evidence suggests that it is more likely and takes less time for firms under stringent public governance and private incentives to emerge from distress in China's weak bankruptcy environment.

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<sup>18</sup>Our additional analyses utilizing real default events among listed companies reveal that, similar to the NBS sample results, government quality has significant influence on distressed companies' recovery. The effect of state ownership is, however, mixed. We suspect that this may be because listed SOEs are more likely to receive government assistance, if indeed in trouble, due to the value of listing quota.

We acknowledge that there may be latent variables that could potentially influence our inference in our panel regression context. To mitigate such influences, we repeat our panel regression analysis with firm-level fixed effect. To be able to estimate the effects of distress in the fixed-effect regressions, we re-estimate and redefine the Z score through letting Z score vary by year. Our results in Appendix IV confirm that all the prior main findings hold in the fixed-effect regressions; therefore, potentially omitted variables do not affect our conclusions.

#### 5.4. Further analyses

We next perform a host of additional analyses to verify the robustness and gain more understanding about our results.

##### 5.4.1 The roles of financial development

We focus on ownership structure and government quality because we anticipate their fundamental impact on distressed firm policies and performance in China. In addition to these, we test a host of other institutional factors, in particular the extent of local financial development. Maskin and Xu (2001) and Sapienza (2004) report that banks play an important role in allocating resources and exerting valuable monitoring on debtors. Ayyagari et al. (forthcoming) find that, despite China's weak financial system, banks play an important role in firm finance. Cull and Xu (2000) document that financial development aligns firm actions with the market mechanism by screening debtors and by making market-driven, instead of policy-driven, loans.

We adopt several variables to capture local financial market development, such as the fraction of short-term loans made to the non-state sector (including agricultural loans, loans to village/township enterprises, loans to private enterprises, and loans to foreign-owned enterprises) divided by total short-term loans in a region (Fan and Wang, 2003), and the fraction of deposits held by non-state-owned financial institutions scaled by total regional deposits (Almanac of China Finance and Banking,

various years). In unreported regression analysis, we find that local financial development affects distressed firm policies and performance as we expect. However, these effects become significantly weaker after we include the local government quality partly because these financial development variables tend to correlate with the quality of government. Nevertheless, the government quality variable remains significant in the regression after we account for the effects of financial development.

#### 5.4.2. Self-selection effects

Previous studies (Bris et al. 2005, Stromberg 2000, Thorburn 2000) point out that firm characteristics have non-negligible influences on firms' decisions to get into distress/bankruptcy and their choices of bankruptcy outlets. Given that different provinces in China present considerably varying business environments, it is conceivable that companies within respective regions may adapt accordingly. Hence, it is possible that the likelihood of companies entering distress is endogenous and affects our inferences about institutional factors' marginal influences on distressed firm behavior.

Therefore, we employ two-stage Heckman's test to explicitly control for such selection effects. First, we perform the first-stage regression to control for different companies' likelihood of entering into distress, as defined previously in our paper. As Panel A of Table 5 shows, for both the matched sample and the sample of listed companies, state ownership and firm leverage positively contribute to firms' likelihood of entering distress, whereas company size reduces firms' likelihood of distress.

Once we consider the selection bias in the second-stage regression, we find that all our original results hold in a way that the interaction term between distress and institutional background (state ownership \* z score and time spending \* z score) remain in the expected sign and highly significant (Panel B and C of Table 5). The evidence again provides strong support to our argument that institutional background matters considerably to distressed firm behavior and outcome.

#### 5.4.3. Change in distressed firms' policies

It is possible that the distressed firms under poor institutional background always may have displayed poor operating performance and aggressive financing policies, even before they entered distress. To make sure that we are not simply picking up a firm-fixed effect in our main regressions, we repeat the same regression by replacing the dependent variables in Tables 2 through 4 with the change in the dependent variables from pre-distress to post-distress period. In particular, we calculate the average performance for the same firm during the pre-distress period and the post-distress periods. We then calculate the percentage performance change in each firm and perform cross-sectional regression of performance change on the institutional background. This approach is in essence a difference-in-difference approach, which enables us to pinpoint how distressed firms adjust their decisions in response to their institutional surroundings. Table 6 reports the results. For the NBS sample (in Panel A) and listed company sample (in Panel B), almost all coefficients of interest remain in the same direction as our main analyses and most of them remain highly significant. We take this as additional support for the findings from our main pooled regressions.

#### 5.4.4. Ownership change and firm behavior

We perform additional analyses to understand how ownership structure change influences distressed firm behavior. If distorted incentive and loose monitoring is responsible for the different behaviors and performances between distressed SOEs and private firms, we would expect that a change in ownership structure around financial distress should lead to changes in firm performance and capital structure decisions accordingly. Table 7 reports results consistent with this expectation. For the NBS sample, increase in private ownership has expected impact on both average companies and, in particular, the distressed companies. For the listed company sample, an increase in private ownership brings significantly better performance and lower leverage to distressed companies. However, perhaps due to

the small number of distressed firms in the sample, we did not find strong support that such changes result in a better chance of recovery from financial distress.

#### 5.4.5. SOEs versus private firms

An alternative and probably more straightforward way of comparing how institutional background influence firms with different ownership structures is by splitting the sample into sub-samples of SOEs and private firms and investigating how firms respond in distress. We find in Table 8 that the results of government quality are retained with in most respective subsamples using only SOEs or private firms. The results are at odds between SOEs and private firms only for the leverage regressions. However, such results are not statistically significant. Overall, our additional exercises suggest that our findings are universal within each sector of the economy, rather than simply reflecting the contrast between SOEs and private companies.

#### 5.4.6. Alternative default definitions

As mentioned in Section 3, we have adopted two alternative ways (leverage and interest coverage) to define inferred financial distress. Our main results remain very similar to those reported in the paper.

## 6. Conclusions

We provide novel evidence on how financially distressed firms' policies respond to external institutional factors in China, the largest emerging market in which bankruptcy law is loosely enforced. We find that institutional background, such as ownership structure and government quality, heavily influence decisions of firms in distress. Companies with higher state ownership and firms from areas with relatively poorer government effectiveness witness worse operating performance, more aggressive corporate financing policies, and lower likelihood of emerging from financial distress. Such findings highlight the importance of institutional and market factors on behavior of firms in distress, which in turn have the potential of changing credit availability, interest rates, and firm capital structures at the national level. The

experience from China sheds lights on our understanding of distressed firm policies in other emerging markets where weak institutions and lax contract enforcement also are prevalent.

There are several areas for future research. One natural extension of the paper is to explore the impact of institutional background in different emerging markets. Similar to Davydenko and Franks (2008), this line of research will take advantage of the cross-border variation in institutional environment and extend existing understanding about firm behavior across emerging markets. Secondly, our results suggest that local institutional background greatly modifies firm behavior as firms adapt their decisions to make the best out of the existing legal system. Such results suggest that future studies should put more emphasis on understanding the details of various institutional backgrounds and how they shape corporate behaviors. Finally, as laws and regulations constantly go through overhauls and revisions, our current study encourages future event studies investigate how banks and firms adapt to changes in institutional background.

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**Appendix I. Number of Annual Filed and Discharged Bankruptcy Cases in China**

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of cases filed	478	1,156	1,938	4,400	5,697	6,206	5,313	5,255	7,233
Number of cases discharged	69	98	142	370	400	n.a.	267	217	315

Source: Law Year Book of China, 1993–2001

## Appendix II. Methods of Classifying Distressed versus Non-distressed Firms

We use three different methods to define distressed versus non-distressed firms for the study: 1) Z-score for emerging markets by Altman et al.(1995),2) leverage, and 3) interest coverage.

1) With the Z-score approach, we follow Altman et al.(1995) in predicting a company's probability of going into distress for the next period in the emerging market. We use the following formula to predict the Z-score for a company during a year:

$$Z \text{ Score} = A \times 6.56 + B \times 3.26 + C \times 6.72 + D \times 1.05 + 3.25,$$

where A stands for working capital/total assets; B stands for retained earnings/total assets; C stands for operating income/total assets; and D stands for book value equity/total liabilities.

Following Altman et al. (1995), we define a company to be in distress if its predicted Z-score is below zero. A firm has to be distressed in at least two consecutive years in the three-year period between 1998 and 2000 to be defined as 'distressed'. On the other hand, we define a company as 'healthy' for the control sample if a company is not defined as 'distressed' in any year during the entire sample period. By definition, distressed companies and control companies do not exhaust the whole set of companies included in the NBS dataset.

2) With the leverage approach, we define a company to be 'distressed' if a company's leverage ratio (defined as the ratio of total liabilities to total assets) is greater than one for at least two years of the three-year period between 1998 and 2000. On the other hand, we define a company as 'healthy' for the control sample if a company's leverage ratio is below one in every year during the entire sample period.

3) With the interest coverage approach, we define a company to be 'distressed' if a company's earnings before interest and tax payment (EBIT) are lower than its interest payment obligation for at least two years of the three-year period between 1998 and 2000. On the other hand, we define a company as 'healthy' for the control sample if a company's EBIT is greater than its interest payment obligation in every year during the entire sample period.

### Appendix III. Variable Description

<b>Variable</b>	<b>Definition</b>
<b>Dependent Variables</b>	
ROS	Return on sales, defined as net earnings divided by total sales.
TFP	Total factor productivity (TFP) is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. The output is the firm sales, and two input factors, Labor and Capital, are measured as the employee number and total fixed assets, respectively.
Earnings growth	The year-by-year percentage growth of total earnings.
Leverage	The ratio of total liabilities to total assets.
Recovery dummy	A dummy variable that equals to one if a firm goes out of financial distress by the end of the sample period, and zero otherwise.
Recovery time	The number of years from the year when a firm falls into distress to the year when a firm emerges from distress and stays out of distress till 2005 for the NBS sample or 2007 for the default sample. For a firm that did not emerge from distress at the end of our sample period, the observation takes the value of 6 years. For firms flipping around distress verge, we look at the last recovering.
<b>Independent Variables</b>	
State ownership	The percentage ownership that state and state agencies own in a company.
Time spending	The percentage days in a year that firms spend in dealing with government regulators, including tax, public security, environmental protection, labor and social security administration (World Bank, 2006).
<b>Control Variables</b>	
Z score	Estimate following the model of Altman et al.(1995).
Default	A dummy variable equal to one if a firm has loan default, and zero otherwise.

List	A dummy variable equal to one if a firm is publicly listed, and zero otherwise.
Size	The natural logarithm of firm assets.
Leverage	The ratio of liability to total assets.
Tangible asset	The ratio of tangible assets to total assets.
Age	The number of years that a firm has been in existence for the NBS sample or listed for the default sample.

## Appendix IV. The Result of Firm Fixed-Effect Regression

This table presents firm fixed-effect regression results of firm performance and leverage on institutional variables for the NBS match and full sample respectively. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. State ownership is the percentage ownership that state and state agencies own in a company. Time spending is the percentage of days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). For easy understanding, we employ the negative value of the Z score in the regression. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence. Year are dummy variables. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

### Panel A NBS Match Sample

	Performance			
	ROS	TFP	Earnings growth	Leverage
State ownership	-0.0168*** (0.000)	-0.0282*** (0.000)	-0.445*** (0.003)	0.0151*** (0.000)
State ownership × Z score	-0.00207*** (0.000)	-0.00302*** (0.000)	-0.0585*** (0.000)	0.00372*** (0.000)
Time spending	-0.635 (0.707)	-2.03 (0.780)	-30.2 (0.886)	-1.62 (0.373)
Time spending × Z score	-0.0466*** (0.000)	-0.0986*** (0.000)	-1.08 (0.188)	0.0173** (0.013)
Z score	0.000386 (0.142)	-0.00614*** (0.000)	-0.0403 (0.227)	0.0163*** (0.000)
Size	0.0163*** (0.000)	0.122*** (0.000)	0.378*** (0.000)	0.0286*** (0.000)
Leverage	-0.0404*** (0.000)	0.175*** (0.000)	0.110 (0.671)	
Tangible asset	0.00922*** (0.002)	-0.0591*** (0.000)	0.250 (0.507)	0.160*** (0.000)
Age	-0.0000572 (0.173)	-0.000657*** (0.000)	-0.0103* (0.055)	0.000113** (0.013)
Constant	-0.299*** (0.000)	-1.01*** (0.001)	-2.51 (0.771)	0.334*** (0.000)
Year	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
Observations	234,874	234,387	228,338	234,874
R-squared	0.600	0.813	0.158	0.859

**Panel B NBS Full Sample**

	Performance			
	ROS	TFP	Earnings growth	Leverage
State ownership	-0.0259*** (0.000)	-0.0408*** (0.000)	-0.276*** (0.000)	0.0213*** (0.000)
State ownership $\times$ Z score	-0.00346*** (0.000)	-0.00397*** (0.000)	-0.0294*** (0.000)	0.00482*** (0.000)
Time spending	-1.26 (0.333)	-0.811 (0.891)	-20.9 (0.742)	-1.05 (0.446)
Time spending $\times$ Z score	-0.0885*** (0.000)	-0.299*** (0.000)	-0.526* (0.078)	0.0735*** (0.000)
Z score	-0.000380 (0.112)	-0.0119*** (0.000)	-0.103*** (0.000)	0.0276*** (0.000)
Size	0.0148*** (0.000)	0.115*** (0.000)	0.133*** (0.000)	0.00687*** (0.000)
Leverage	-0.0211*** (0.000)	0.328*** (0.000)	1.13*** (0.000)	
Tangible asset	0.0170*** (0.000)	-0.0513*** (0.000)	-0.242* (0.054)	0.180*** (0.000)
Age	-0.0000413 (0.229)	-0.000278* (0.075)	-0.00699*** (0.000)	0.0000684* (0.058)
Constant	-0.129** (0.014)	-1.12*** (0.000)	-0.993 (0.698)	0.579*** (0.000)
Year	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
Observations	316,620	315,874	269,213	316,620
R-squared	0.569	0.782	0.159	0.868

## Table 1 Summary Statistics

This table presents the descriptive statistics of dependent and independent variables. The statistics of NBS firms is based on the full sample from the National Bureau of Statistics survey and the listed company sample includes all listed companies in the industrial sectors. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. Recovery dummy is a dummy variable that equals to one if a financially distressed firm goes out of distress by the end of the sample period, and zero otherwise. Recovery time is the number of years that a financially distressed firm stays in distress. State ownership is the percentage ownership that state and state agencies own in a firm. Time spending is the percentage of days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). Default is a dummy variable, equal to one if a firm has loan default, and zero otherwise. List is a dummy variable, equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence for the NBS sample or listed for default sample.<sup>Δ</sup> indicates observation at the beginning of the financial distress. The sample sizes of distress and non-distress firms are 1,955 and 37,873 for the NBS full sample, and 38 and 894 for the listed company sample, respectively. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

### Panel A NBS Full Sample

Variables	Observation	Mean	Median	Std. Dev.
Dependent variables				
ROS	318,454	-0.000414	0.0133	0.147
TFP	317,627	0.154	0.173	0.933
Earnings growth	270,640	0.204	0.112	8.34
Leverage	318,463	0.603	0.605	0.279
Recovery dummy	1,955	0.459	0.00	0.498
Recovery time	1,955	4.56	6.00	1.86
Independent variables				
State ownership	316,848	0.421	0.140	0.454
Time spending	31	0.0440	0.0417	0.0111
Z score	318,463	5.83	5.05	5.33
List	398,28	0.00495	0.000	0.0702
Size <sup>Δ</sup>	398,28	10.3	10.1	1.48
Leverage <sup>Δ</sup>	398,28	0.606	0.613	0.269
Tangible asset <sup>Δ</sup>	398,28	0.937	0.981	0.0990
Age <sup>Δ</sup>	398,17	16.5	10.0	14.6

### Panel B Listed Company Sample

Variables	Observation	Mean	Median	Std. Dev.
Dependent variables				
ROS	4,724	0.0627	0.0597	0.164
TFP	4,705	0.0661	0.0114	0.724
Earnings growth	4,279	-0.0695	0.0342	3.63
Leverage	4,724	0.448	0.444	0.203
Recovery dummy	38	0.605	1.00	0.495
Recovery time	38	3.92	4.50	2.02
Independent variables				
State ownership	4,654	0.386	0.428	0.247
Default	932	0.0408	0.00	0.198
Size <sup>Δ</sup>	932	20.8	20.7	0.856
Leverage <sup>Δ</sup>	932	0.387	0.376	0.166
Tangible asset <sup>Δ</sup>	932	0.967	0.982	0.0469
Age <sup>Δ</sup>	932	2.68	2.00	1.68

**Panel C Distressed Firms Versus Non-distressed Firms of the NBS Full Sample**

Variables	Mean			Median		
	Distress	Non-distress	Difference	Distress	Non-distress	Difference
ROS	-0.145	0.00524	-0.151***	-0.0259	0.0143	-0.0402***
TFP	-0.479	0.178	-0.657***	-0.388	0.191	-0.579***
Earnings growth	-0.373	0.227	-0.600***	0.197	0.109	0.0879
Leverage	1.05	0.586	0.466***	1.04	0.595	0.445***
State ownership	0.547	0.416	0.131***	0.800	0.108	0.692***
Z score	-0.912	6.10	-7.01***	-1.25	5.17	-6.43***
List	0.000668	0.00511	-0.00445**	0.00	0.00	0.00**
Size <sup>Δ</sup>	10.0	10.3	-0.257***	9.97	10.1	-0.172***
Leverage <sup>Δ</sup>	1.11	0.586	0.520***	1.08	0.601	0.482***
Tangible asset <sup>Δ</sup>	0.924	0.938	-0.0142***	0.979	0.981	-0.00166**
Age <sup>Δ</sup>	20.1	16.4	3.70***	14.0	10.0	4.00***

**Panel D Distressed Firms Versus Non-distressed Firms of the Listed Company Sample**

Variables	Mean			Median		
	Default	Non-default	Difference	Default	Non-default	Difference
ROS	-0.0840	0.0683	-0.152***	0.0158	0.0613	-0.0455***
TFP	-0.314	0.0822	-0.397***	-0.358	0.0228	-0.381***
Earnings growth	-0.496	-0.0521	-0.443	0.0980	0.0330	0.0651
Leverage	0.660	0.440	0.219***	0.649	0.439	0.210***
State ownership	0.253	0.391	-0.138***	0.287	0.433	-0.147***
Size <sup>Δ</sup>	20.3	20.9	-0.582***	20.2	20.8	-0.557***
Leverage <sup>Δ</sup>	0.668	0.375	0.293***	0.673	0.367	0.306***
Tangible asset <sup>Δ</sup>	0.923	0.969	-0.0455***	0.955	0.983	-0.0272***
Age <sup>Δ</sup>	4.68	2.60	2.09***	5.00	2.00	3.00***

**Table 2 The Result of Performance, Capital Structure and Recovery of NBS Firms (Match Sample)**

This table presents panel-regression results of firm performance, leverage and recovery on institutional variables for the match sample of NBS firms. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. Recovery dummy is a dummy variable that equals to one if a financially distressed firm goes out of distress by the end of the sample period, and zero otherwise. Recovery time is the number of years that a financially distressed firm stays in distress. State ownership is the percentage ownership that state and state agencies own in a company. Time spending is the percentage of days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). For easy understanding, we employ the negative value of the Z score in the regression. List is a dummy variable equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence. Industry and year are dummy variables. <sup>Δ</sup> indicates observation at the beginning of the financial distress. Standard errors are clustered at the firm level. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

	Performance			Leverage	Recovery	
	ROS	TFP	Earnings growth		Possibility	Time
State ownership	-0.0622*** (0.000)	-0.479*** (0.000)	-0.312*** (0.000)	0.0683*** (0.000)	-0.373*** (0.000)	1.04*** (0.000)
State ownership × Z score	-0.00472*** (0.000)	-0.0193*** (0.000)	-0.00841* (0.058)	0.00997*** (0.000)		
Time spending	-1.41*** (0.000)	-10.6*** (0.000)	-12.6*** (0.000)	1.14*** (0.000)	-8.30*** (0.006)	21.6** (0.013)
Time spending × Z score	-0.129*** (0.000)	-0.528*** (0.000)	-0.572*** (0.003)	0.0216*** (0.006)		
Z score	-0.00237*** (0.000)	-0.0256*** (0.000)	-0.00247 (0.383)	0.0284*** (0.000)		
List	0.0431*** (0.000)	0.165*** (0.001)	-0.277*** (0.002)	-0.0441*** (0.000)	2.39*** (0.000)	-5.95* (0.065)
Size <sup>Δ</sup>	0.00493*** (0.000)	0.210*** (0.000)	0.0195*** (0.006)	-0.0104*** (0.000)	-0.0843*** (0.006)	0.195*** (0.002)
Leverage <sup>Δ</sup>	-0.0755*** (0.000)	0.168*** (0.000)	-0.0286 (0.627)		-1.09*** (0.000)	2.83*** (0.000)
Tangible asset <sup>Δ</sup>	0.0385*** (0.000)	0.511*** (0.000)	-0.0489 (0.657)	0.138*** (0.000)	0.186 (0.486)	-0.417 (0.555)
Age <sup>Δ</sup>	-0.000846*** (0.000)	-0.0143*** (0.000)	-0.00716*** (0.000)	0.00156*** (0.000)	-0.0151*** (0.000)	0.0374*** (0.000)
Constant	-0.271*** (0.000)	-2.73*** (0.000)	1.50*** (0.000)	0.912*** (0.000)		-2.14* (0.078)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes
Observations	234,991	234,504	228,452	234,991	1,927	1,927
R-squared/Log likelihood	0.142	0.221	0.006	0.392	-6,393	-2,938

**Table 3 The Result of Performance and Capital Structure of NBS Firms(Full Sample)**

This table presents panel-regression results of firm performance and leverage on institutional variables for the full sample of NBS data. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. State ownership is the percentage that state and state agencies own in a company. Time spending is the percentage of days in a year that firms spend with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). For easily understanding, we employ the negative value of Z score in the regression. List is a dummy variable equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence. Industry and year are dummy variables. We don't present the results of recovery since they are the same as those of the match sample. <sup>Δ</sup> indicates observation at the beginning of the financial distress. Standard errors are clustered at the firm level. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

	Performance			Leverage
	ROS	TFP	Earnings growth	
State ownership	-0.0762*** (0.000)	-0.519*** (0.000)	-1.04*** (0.000)	0.0541*** (0.000)
State ownership × Z score	-0.00672*** (0.000)	-0.0190*** (0.000)	-0.0711*** (0.000)	0.00855*** (0.000)
Time spending	-1.62*** (0.000)	-10.1*** (0.000)	-16.7*** (0.000)	1.15*** (0.000)
Time spending × Z score	-0.182*** (0.000)	-0.827*** (0.000)	-0.835*** (0.007)	0.0590** (0.015)
Z score	-0.00830*** (0.000)	-0.0369*** (0.000)	-0.133*** (0.000)	0.0409*** (0.000)
List	0.0468*** (0.000)	0.205*** (0.000)	-0.181 (0.262)	-0.0298*** (0.000)
Size <sup>Δ</sup>	0.00378*** (0.000)	0.203*** (0.000)	0.0276** (0.017)	-0.0114*** (0.000)
Leverage <sup>Δ</sup>	-0.0244*** (0.000)	0.127*** (0.000)	1.00*** (0.000)	
Tangible asset <sup>Δ</sup>	0.0330*** (0.000)	0.525*** (0.000)	-0.301* (0.093)	0.124*** (0.000)
Age <sup>Δ</sup>	-0.000712*** (0.000)	-0.0127*** (0.000)	-0.0152*** (0.000)	0.00100*** (0.000)
Constant	-0.0670*** (0.000)	-2.31*** (0.000)	0.255 (0.356)	0.800*** (0.000)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes	Yes
Observations	315,355	314,630	268,523	315,362
R-squared	0.169	0.233	0.012	0.630

**Table 4 The Result of Performance, Capital Structure and Recovery of Listed Company Sample**

This table presents panel-regression results of firm performance, leverage and recovery on institutional variables for the default sample of listed companies. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. Recovery dummy is a dummy variable that equals to one if a financially distressed firm goes out of distress by the end of the sample period, and zero otherwise. Recovery time is the number of years that a financially distressed firm stays in distress. State ownership is the percentage that state and state agencies own in a company. Time spending is the percentage days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Default is a dummy variable equal to one if a firm has loan default, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been listed. Industry and year are dummy variables. <sup>Δ</sup> indicates observation at the beginning of the financial distress. Standard errors are clustered at the firm level. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

	Performance			Leverage	Recovery	
	ROS	TFP	Earnings growth		Possibility	Time
State ownership	0.0105 (0.308)	-0.0906 (0.312)	0.154 (0.468)	-0.0388*** (0.000)	1.03 (0.538)	-2.53 (0.341)
State ownership Default	-0.0976** (0.046)	0.339 (0.429)	-0.587 (0.543)	0.123** (0.016)		
Time spending	-0.357 (0.137)	-0.943 (0.669)	-5.59 (0.259)	-0.667*** (0.007)	-84.3*** (0.006)	173* (0.094)
Time spending Default	-4.93*** (0.009)	6.00 (0.696)	-73.2** (0.049)	3.75* (0.056)		
Default	-0.0884*** (0.000)	-0.255** (0.039)	-0.511* (0.077)	0.205*** (0.000)		
Size <sup>Δ</sup>	0.00901*** (0.003)	0.145*** (0.000)	0.0514 (0.412)	0.0410*** (0.000)	0.299 (0.391)	-0.265 (0.652)
Leverage <sup>Δ</sup>	-0.156*** (0.000)	0.253 (0.108)	-0.635* (0.057)		0.0798 (0.974)	2.69 (0.668)
Tangible asset <sup>Δ</sup>	-0.0222 (0.674)	0.394 (0.416)	-0.324 (0.760)	-0.295*** (0.000)	0.828 (0.693)	3.42 (0.417)
Age <sup>Δ</sup>	-0.00806*** (0.000)	-0.0589*** (0.000)	-0.0844*** (0.009)	0.0159*** (0.000)	0.177 (0.697)	-0.673 (0.185)
Constant	0.0282 (0.718)	-3.14*** (0.000)	-0.458 (0.774)	-0.261*** (0.001)		-3.40 (0.812)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,654	4,639	4,264	4,654	29	35
R-squared/Log likelihood	0.159	0.069	0.019	0.277	-42.59	-55.03

## Table 5 The Result of Heckman Regression

This table presents Heckman-regression results of firm performance and leverage on institutional variables for the match NBS sample and listed company sample. The first-stage result is reported in Panel A. The dependent variable is a dummy variable equal to one if a firm follows in distress or has loan default respectively for NBS firms and listed companies, and zero otherwise. Panel B and C reports the second-stage results. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. State ownership is the percentage that state and state agencies own in a company. Time spending is the percentage days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). For easily understanding, we employ the negative value of Z score in the regression. Default is a dummy variable equal to one if a firm has loan default, and zero otherwise. List is a dummy variable equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence for the NBS sample or listed for default sample. Industry and year are dummy variables. <sup>Δ</sup> indicates observation at the beginning of the financial distress. Standard errors are clustered at the firm level. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

### Panel A The First-stage Regression

	NBS Match Sample	Listed Company Sample
State ownership	0.202*** (0.000)	0.829* (0.053)
Time spending	4.49*** (0.000)	-1.78 (0.629)
List	0.0873 (0.562)	
Size	-0.0646*** (0.000)	-0.580*** (0.000)
Leverage	3.59*** (0.000)	1.22*** (0.002)
Age	-0.00232*** (0.000)	0.247*** (0.000)
Industry	Yes	Yes
Year	Yes	Yes
Observations	234,834	4,653
R-squared	0.477	0.340

**Panel B The Second-stage Regression (NBS Match Sample)**

	Performance			
	ROS	TFP	Earnings growth	Leverage
State ownership	-0.0553*** (0.000)	-0.470*** (0.000)	-0.188*** (0.000)	-0.0431*** (0.000)
State ownership $\times$ Z score	-0.00462*** (0.000)	-0.0192*** (0.000)	-0.00690** (0.029)	0.00162*** (0.000)
Time spending	-1.24*** (0.000)	-10.4*** (0.000)	-8.38*** (0.000)	-1.11*** (0.000)
Time spending $\times$ Z score	-0.127*** (0.000)	-0.524*** (0.000)	-0.346** (0.014)	0.00277*** (0.003)
Z score	-0.00225*** (0.000)	-0.0255*** (0.000)	0.000430 (0.833)	-0.000466*** (0.000)
Mill's ratio	0.0334*** (0.000)	0.0374*** (0.000)	0.182*** (0.000)	-0.313*** (0.000)
List	0.0427*** (0.000)	0.164*** (0.001)	-0.280*** (0.000)	-0.0166*** (0.000)
Size <sup>Δ</sup>	0.00294*** (0.000)	0.208*** (0.000)	0.00509 (0.323)	0.0162*** (0.000)
Leverage <sup>Δ</sup>	0.00200 (0.700)	0.255*** (0.000)	0.4209*** (0.000)	
Tangible asset <sup>Δ</sup>	0.0364*** (0.000)	0.509*** (0.000)	-0.0829 (0.286)	0.000541 (0.307)
Age <sup>Δ</sup>	-0.000810*** (0.000)	-0.0142*** (0.000)	-0.00461*** (0.000)	0.000504*** (0.000)
Constant	-0.344*** (0.000)	-2.82*** (0.000)	0.496*** (0.000)	0.928*** (0.000)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes	Yes
Observations	234,834	234,347	228,302	234,834
R-squared	0.156	0.221	0.008	0.991

**Panel C The Second-stage Regression (Listed Company Sample)**

	Performance			
	ROS	TFP	Earnings growth	Leverage
State ownership	0.0451*** (0.000)	-0.0202 (0.824)	0.556*** (0.009)	-0.101*** (0.000)
State ownership ×Default	-0.122** (0.010)	0.248 (0.546)	-0.862 (0.367)	0.201*** (0.000)
Time spending	-0.408* (0.079)	-0.874 (0.684)	-6.58 (0.179)	-0.278 (0.181)
Time spending ×Default	-5.96*** (0.001)	-3.01 (0.843)	-86.4** (0.019)	7.96*** (0.000)
Default	-0.0919*** (0.000)	-0.160 (0.168)	-0.560** (0.050)	0.154*** (0.000)
Mill's ratio	0.135*** (0.000)	0.347*** (0.000)	1.75*** (0.000)	-0.250*** (0.000)
Size <sup>Δ</sup>	-0.0611*** (0.000)	-0.0332 (0.424)	-0.863*** (0.000)	0.159*** (0.000)
Leverage <sup>Δ</sup>	-0.0306* (0.079)	0.591*** (0.000)	0.984*** (0.007)	
Tangible asset <sup>Δ</sup>	-0.0256 (0.616)	0.320 (0.467)	-0.371 (0.723)	-0.229*** (0.000)
Age <sup>Δ</sup>	0.0301*** (0.000)	0.0394* (0.083)	0.385*** (0.000)	-0.0580*** (0.000)
Constant	0.306*** (0.000)	-2.40*** (0.001)	3.41** (0.035)	-0.652*** (0.000)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes	Yes
Observations	4,653	4,576	4,263	4,653
R-squared	0.210	0.082	0.042	0.407

**Table 6 The Result of Change Regression**

This table reports cross-sectional results on changes in firm performance and leverage on institutional variables. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. State ownership is the percentage that state and state agencies own in a company. Time spending is the percentage of days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). For easily understanding, we employ the negative value of Z score in the regression. Default is a dummy variable equal to one if a firm has loan default, and zero otherwise. List is a dummy variable equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence for the NBS sample or listed for the listed company sample. Industry are dummy variables <sup>Δ</sup> indicates observation at the beginning of the financial distress. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Panel A NBS Firms (Match Sample)**

	ROS	TFP	Earnings growth	Leverage
State ownership	-0.698*** (0.000)	-0.0880* (0.076)	-1.86*** (0.000)	0.0927*** (0.000)
State ownership × Z score	-0.0186* (0.086)	-0.00793 (0.226)	-0.0600* (0.090)	0.00706*** (0.000)
Time spending	-24.4*** (0.000)	-6.85*** (0.002)	-51.5*** (0.000)	1.77*** (0.000)
Time spending × Z score	-0.738* (0.085)	-0.0161 (0.954)	-2.66* (0.075)	0.211*** (0.000)
Z score	0.0857*** (0.000)	0.0172 (0.147)	0.103 (0.101)	-0.0475*** (0.000)
List	0.120 (0.446)	0.0475 (0.791)	-0.138 (0.882)	-0.00254 (0.931)
Size <sup>Δ</sup>	-0.00250 (0.881)	0.0778*** (0.000)	-0.209*** (0.000)	-0.0139*** (0.000)
Leverage <sup>Δ</sup>	0.195 (0.188)	-0.0670 (0.434)	-0.0335 (0.942)	
Tangible asset <sup>Δ</sup>	0.191 (0.455)	0.218 (0.130)	-0.596 (0.437)	-0.277*** (0.000)
Age <sup>Δ</sup>	-0.0161*** (0.000)	-0.0159*** (0.000)	-0.0204*** (0.000)	0.00113*** (0.000)
Constant	3.70*** (0.000)	-0.418* (0.074)	12.2*** (0.000)	0.124*** (0.001)
Industry	Yes	Yes	Yes	Yes
Observations	33,315	33,112	30,645	33,571
R-squared	0.035	0.020	0.019	0.178

**Panel B Listed Company Sample**

	ROS	TFP	Earnings growth	Leverage
State ownership	0.0294 (0.333)	0.103 (0.223)	0.137 (0.550)	-0.0186 (0.289)
State ownership Default	-1.20*** (0.000)	-0.850** (0.026)	1.61 (0.226)	0.240*** (0.007)
Time spending	-0.547 (0.410)	3.31* (0.072)	-1.32 (0.793)	0.197 (0.605)
Time spending Default	-22.3*** (0.000)	-25.5** (0.040)	-97.3** (0.025)	4.47 (0.107)
Default	1.70*** (0.000)	1.82*** (0.001)	4.89*** (0.005)	-0.301** (0.012)
Size <sup>Δ</sup>	-0.000649 (0.941)	-0.0681*** (0.005)	-0.00165 (0.980)	-0.0149*** (0.002)
Leverage <sup>Δ</sup>	0.199*** (0.000)	0.370*** (0.005)	-0.506 (0.166)	
Tangible asset <sup>Δ</sup>	-0.0372 (0.814)	0.608 (0.146)	0.323 (0.788)	-0.0139 (0.878)
Age <sup>Δ</sup>	-0.0186*** (0.000)	0.0106 (0.371)	-0.106*** (0.001)	-0.00242 (0.324)
Constant	-0.0734 (0.745)	0.709 (0.250)	0.218 (0.899)	0.416*** (0.001)
Industry	Yes	Yes	Yes	Yes
Observations	883	881	818	883
R-squared	0.246	0.102	0.058	0.067

**Table 7 The Result of Ownership Change**

This table reports the regression result of firm performance, capital structure and recovery on increase of private ownership. ROS is defined as net earnings divided by total sales. Leverage is the ratio of total liabilities to total assets. Recovery dummy is a dummy variable that equals to one if a financially distressed firm goes out of distress by the end of the sample period, and zero otherwise. Recovery time is the number of years that a financially distressed firm stays in distress. We exclude the results of TFP and earnings growth to conserve space. These two variables generate qualitatively similar results to ROS and are available from the authors upon request. Increase is a dummy variable equal to one if there is a positive change in non-state ownership, and zero otherwise. Z score is estimated following the model of Altman et al. (1995). For easy understanding, we employ the negative value of Z score in the regression. Default is a dummy variable equal to one if a firm has loan default, and zero otherwise. List is a dummy variable equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence for the NBS sample or listed for the default sample. Industry and year are dummy variables. <sup>Δ</sup> indicates observation at the beginning of the financial distress. Standard errors are clustered at the firm level. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

	NBS match sample				Listed company sample			
	ROS	Leverage	Recovery Probability	Time to Recovery	ROS	Leverage	Recovery Probability	Time to Recovery
Increase	0.0176*** (0.000)	-0.000935 (0.706)	0.436*** (0.000)	-1.17*** (0.000)	0.0332 (0.634)	-0.0203 (0.109)	0.249 (0.614)	-0.494 (0.717)
Increase × Z score/Default	0.00112*** (0.000)	-0.000567* (0.085)			2.21*** (0.000)	-0.177*** (0.005)		
Z score / Default	-0.00182*** (0.000)	0.0294*** (0.000)			-0.701*** (0.000)	0.345*** (0.000)		
List	0.0379*** (0.000)	-0.0440*** (0.000)	2.16*** (0.000)	-5.30 (0.100)				
Size <sup>Δ</sup>	0.00422*** (0.000)	-0.0118*** (0.000)	-0.0845*** (0.009)	0.189*** (0.003)	0.0851** (0.016)	0.0247*** (0.000)	0.148 (0.596)	-0.489 (0.445)
Leverage <sup>Δ</sup>	-0.0770*** (0.000)		-1.18*** (0.000)	3.02*** (0.000)	-0.625*** (0.001)		-1.33 (0.499)	2.21 (0.607)
Tangible asset <sup>Δ</sup>	0.0371*** (0.000)	0.141*** (0.000)	0.228 (0.379)	-0.458 (0.518)	-0.651 (0.286)	-0.577*** (0.000)	-0.345 (0.834)	3.78 (0.446)
Age <sup>Δ</sup>	-0.00129*** (0.000)	0.00208*** (0.000)	-0.0200*** (0.000)	0.0519*** (0.000)	-0.0214 (0.241)	0.0162*** (0.000)	0.109 (0.631)	-0.262 (0.658)
Constant	0.0132 (0.159)	0.677*** (0.000)		-0.529 (0.651)	-0.849 (0.343)	0.369** (0.023)		11.1 (0.413)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	No	No	Yes	Yes	No	No
Cluster	By firm	By firm	By region	No	By firm	By firm	By region	No
Observations	201,494	201,494	1,891	1,891	3,801	3,801	28	34
R-squared/Log likelihood	0.108	0.380	-6240	-2874	0.026	0.141	-43.43	-62.74

**Table 8 The Result of SOEs Versus Private Firms**

This table reports the result of previous regressions for sub-sample SOEs and private firms, respectively. ROS is defined as net earnings divided by total sales. TFP is the estimated residual of a log-linear Cobb-Douglas production function for each industry and year. Earnings growth is the year-by-year percentage growth of total earnings. Leverage is the ratio of total liabilities to total assets. Recovery dummy is a dummy variable that equals to one if a financially distressed firm goes out of distress by the end of the sample period, and zero otherwise. Recovery time is the number of years that a financially distressed firm stays in distress. Time spending is the percentage of days in a year that firms spend in dealing with government regulators including tax, public security, environmental protection, labor and social security administrations. Z score is estimated following the model of Altman et al. (1995). For easy understanding, we employ the negative value of Z score in the regression. Default is a dummy variable equal to one if a firm has loan default, and zero otherwise. List is a dummy variable equal to one if a firm is publicly listed, and zero otherwise. Size is the natural logarithm of firm assets. Tangible asset is the ratio of tangible assets to total assets. Age is the number of years that a firm has been in existence for the NBS sample or listed for the default sample. Industry and year are dummy variables. <sup>Δ</sup> indicates observation at the beginning of the financial distress. The listed company sample doesn't present the result of recovery probability and time to recovery since the sample size is too small to run sub-sample regression. Standard errors are clustered at the firm level. P-values are provided in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Panel A NBS Firms (Match Sample)**

	ROS		TFP		Earnings growth		Leverage		Recovery Probability		Time to Recovery	
	SOE	Private	SOE	Private	SOE	Private	SOE	Private	SOE	Private	SOE	Private
Time spending	-2.18*** (0.000)	-0.612*** (0.000)	-13.7*** (0.000)	-6.89*** (0.000)	-12.4*** (0.000)	-12.6*** (0.000)	0.456 (0.230)	1.93*** (0.000)	-9.92** (0.018)	-3.72 (0.290)	26.1** (0.030)	10.6 (0.434)
Time spending × Z score	-0.198*** (0.000)	-0.0723*** (0.000)	-0.461*** (0.010)	-0.510*** (0.000)	-0.430 (0.161)	-0.661*** (0.007)	-0.0379 (0.595)	0.0935* (0.085)				
Z score	-0.00190*** (0.000)	-0.00202*** (0.000)	-0.0207*** (0.000)	-0.0258*** (0.000)	-0.00364 (0.505)	-0.00175 (0.573)	0.0343*** (0.000)	0.0246*** (0.000)				
List	0.0303*** (0.000)	0.0419*** (0.001)	0.182*** (0.001)	0.0688 (0.458)	-0.274*** (0.008)	-0.307* (0.093)	-0.0693*** (0.000)	-0.0234 (0.138)	2.66*** (0.000)		-6.57* (0.059)	
Size <sup>Δ</sup>	0.00854*** (0.000)	0.00174*** (0.000)	0.229*** (0.000)	0.192*** (0.000)	0.0479*** (0.000)	-0.0180* (0.052)	-0.00406*** (0.000)	-0.0163*** (0.000)	-0.0537 (0.158)	0.0980*** (0.003)	0.119 (0.200)	0.241** (0.011)
Leverage <sup>Δ</sup>	-0.134*** (0.000)	-0.0384*** (0.000)	-0.179*** (0.000)	0.398*** (0.000)	-0.149 (0.122)	0.0568 (0.439)			-1.04*** (0.000)	-1.09*** (0.000)	2.80*** (0.000)	2.74*** (0.000)
Tangible asset <sup>Δ</sup>	0.0521*** (0.000)	0.0294*** (0.000)	0.462*** (0.000)	0.580*** (0.000)	0.111 (0.514)	-0.205 (0.148)	0.104*** (0.000)	0.176*** (0.000)	0.414 (0.300)	0.0847 (0.861)	-0.711 (0.473)	-0.203 (0.848)
Age <sup>Δ</sup>	-0.00134*** (0.000)	0.000293*** (0.000)	-0.0159*** (0.000)	-0.0122*** (0.000)	-0.00736*** (0.000)	-0.00886*** (0.000)	0.000776*** (0.000)	0.00241*** (0.000)	0.0177*** (0.000)	-0.0118** (0.011)	0.0469*** (0.000)	0.0258** (0.020)
Constant	-0.318*** (0.000)	-0.192*** (0.000)	-2.75*** (0.000)	-2.68*** (0.000)	0.807*** (0.002)	2.23*** (0.000)	0.916*** (0.000)	0.939*** (0.000)			-0.516 (0.757)	-1.99 (0.285)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Cluster	By firm	By firm	By firm	By firm	By firm	By firm	By firm	By firm	By region	By region	No	No
Observations	97,471	137,520	97,274	137,230	93,616	134,836	97,471	137,520	1,123	804	1123	804
R-squared / Log likelihood	0.140	0.092	0.224	0.157	0.007	0.003	0.684	0.599	-2,815	-2,956	-1,489	-1,429



**Panel B Listed Company Sample**

	ROS		TFP		Earnings growth		Leverage	
	SOE	Private	SOE	Private	SOE	Private	SOE	Private
Time spending	-0.179 (0.479)	-0.0775 (0.911)	-0.385 (0.872)	-2.99 (0.515)	-3.30 (0.538)	-7.09 (0.601)	-0.790*** (0.003)	-1.20* (0.066)
Time spending ×Default	-4.62** (0.030)	-6.82 (0.111)	15.2 (0.404)	-42.3* (0.095)	-35.8 (0.405)	-185** (0.020)	2.71 (0.229)	10.9*** (0.007)
Default	-0.0853*** (0.000)	-0.0766*** (0.004)	-0.267** (0.042)	-0.240 (0.272)	-0.296 (0.372)	-0.771 (0.118)	0.209*** (0.000)	0.144*** (0.000)
Size <sup>Δ</sup>	0.0141*** (0.000)	-0.0185** (0.034)	0.137*** (0.000)	0.142** (0.047)	0.112* (0.094)	-0.302* (0.072)	0.0344*** (0.000)	0.0729*** (0.000)
Leverage <sup>Δ</sup>	-0.175*** (0.000)	-0.0397 (0.315)	0.267 (0.109)	0.101 (0.777)	-0.672* (0.077)	-0.00664 (0.993)		
Tangible asset <sup>Δ</sup>	-0.0356 (0.555)	0.174 (0.142)	0.631 (0.237)	0.412 (0.694)	-0.607 (0.628)	1.33 (0.548)	-0.303*** (0.000)	-0.428*** (0.000)
Age <sup>Δ</sup>	-0.00739*** (0.000)	-0.0137*** (0.001)	-0.0522*** (0.001)	-0.0646** (0.036)	-0.0648* (0.069)	-0.171** (0.030)	0.0122*** (0.000)	0.0312*** (0.000)
Constant	-0.0613 (0.468)	0.388** (0.048)	-3.20*** (0.000)	-3.09* (0.058)	-1.57 (0.376)	5.88 (0.119)	-0.109 (0.220)	-0.818*** (0.000)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	By firm	By firm	By firm	By firm	By firm	By firm	By firm	By firm
Observations	3,677	977	3,654	985	3,384	880	3,677	977
R-squared	0.190	0.113	0.076	0.133	0.018	0.050	0.217	0.353