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When Should Bankruptcy Law Be Creditor- or Debtor-Friendly

Finance Working Paper N° 512/2017
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Keywords: Bankruptcy, private benefits of control, investment, law and economics

JEL Classifications: G31, G32, G33, G38, K22

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When Should Bankruptcy Law Be Creditor- or Debtor-Friendly? Theory and Evidence*

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November 25, 2019

Abstract

We examine how stronger creditor protection affects firms with different levels of private benefits of control. Theoretically, we show that firms with high private benefits of control borrow and invest more under a more debtor-friendly management stay system, whereas firms with low private benefits of control borrow and invest more under a more creditor-friendly receivership system. Intuitively, stronger creditor protection alleviates the impact of credit market frictions, but reduces credit demand. Which effect dominates depends on firms' private benefits of control. Empirically, we find support for these predictions using a Korean bankruptcy reform, which replaced receivership with management stay.

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1 Introduction

Empirical evidence on the optimal degree of creditor protection in bankruptcy is mixed. Pioneered by La Porta et al. (1997, 1998), several studies document a positive relationship between creditor protection and the size of credit markets.[1] In contrast, several recent studies suggest a negative relationship (Acharya and Subramanian 2009; Acharya, Amihud, and Litov 2011; Vig 2013).

These seemingly contradictory results are consistent with theory, which argues that strengthening creditor protection can have two opposing effects. On the one hand, stronger creditor protection can alleviate the impact of credit market frictions. By making bankruptcy states more costly for owners and managers, stronger creditor protection can mitigate agency problems such as managerial moral hazard (see, e.g., Jensen and Meckling 1976), which makes firms less financially constrained. On the other hand, by making bankruptcy states more costly for owners and managers, stronger creditor protection can reduce firms' demand for credit. Owners and managers may try to avoid default to the extent that they forgo risky but valuable investment opportunities (see, e.g., Donaldson 1969; Amihud and Lev 1981; Eberhart and Senbet 1993), leading to "a significant underinvestment problem even where the firm is solvent" (Rasmussen 1994).

The mixed empirical evidence suggests that, depending on the circumstances, the positive agency effect or the negative demand effect of stronger creditor protection can dominate. For example, which effect dominates may depend on the legal and institutional environment, the structure of capital markets, or firm characteristics. Understanding under which circumstances stronger creditor protection leads to more or less borrowing and investment is crucial for policymakers seeking to determine the optimal degree of creditor protection.

We address this question by studying how the effect of stronger creditor protection differs across firms. In the first part of the paper, we develop a financial contracting model and show that owners' and managers' private benefits of control are a fundamental determinant of the relative strength of the agency and demand effects. In the second part, we test the model's predictions using a bankruptcy reform in Korea and find support for the predictions in the data.

In the model, we consider a firm run by an owner-manager who requires financing for an investment project. We combine two standard frictions. First, the project's NPV is positive only if the owner-manager exerts effort. Thus, the owner-manager can only obtain financing if she has sufficient incentives to exert effort (the "agency constraint"). Second, the owner-manager derives noncontractible private benefits of control and loses them if she loses control of the firm

[1] See also Levine (1998, 1999); Djankov, McLiesh, and Shleifer (2007); Qian and Strahan (2007); Djankov et al. (2008); Haselmann, Pistor, and Vig (2010); Campello and Larrain (2016); Ponticelli and Alencar (2016).

in the event of default. The risk of losing private benefits of control introduces private bankruptcy costs, which can render the owner-manager unwilling to invest in valuable investment projects (the "demand constraint"). To assess the effect of creditor protection on credit market frictions and credit demand, we compare the owner-manager's borrowing and investment decisions under two bankruptcy regimes: a more creditor-friendly receivership system and a more debtor-friendly management stay system. Under the receivership system, the owner-manager is more likely to lose control of the firm in the event of default, which implies higher private bankruptcy costs compared with the management stay system.

We show that firms with low levels of private benefits of control borrow and invest more under the more creditor-friendly receivership system. The positive agency effect of stronger creditor protection dominates the negative demand effect, since owner-managers with low levels of private benefits of control face low private bankruptcy costs. Thus, the agency constraint binds. An increase in private bankruptcy costs increases the owner-manager's incentive to exert effort and alleviates the impact of credit market frictions, which makes the firm less financially constrained. In contrast, firms with high levels of private benefits of control borrow and invest more under the more debtor-friendly management stay system. The negative demand effect of stronger creditor protection dominates the positive agency effect, since owner-managers with high levels of private benefits of control face high private bankruptcy costs. Thus, the demand constraint binds. An increase in private bankruptcy costs further reduces the owner-manager's willingness to invest and reduces the demand for credit.

In the second part of the paper, we test the model's predictions by exploiting a bankruptcy reform in Korea in 2006 that replaced a more creditor-friendly receivership system with a more debtor-friendly management stay system. Under the pre-reform receivership system, the manager is forced to resign and ownership is transferred to new investors upon filing for bankruptcy. Under the post-reform management stay system, the manager stays in control and ownership of the firm is retained by the existing owners during the bankruptcy process.[2]

We start out by comparing borrowing and investment decisions for firms with high and low levels of private benefits of control under the more creditor-friendly receivership and the more debtor-friendly management stay system.[3] Consistent with the predictions of the model, we find that firms with high private benefits of control increase borrowing and investment relative to firms

[2]Under the pre-reform receivership system, the CEO is replaced in 95.24 percent of bankruptcy cases in our sample, and ownership is transferred in 90.91 percent of cases that do not result in liquidation, compared with only 11.86 percent and 19.09 percent, respectively, under the post-reform management stay system. For details, see Section 2.

[3]We use ownership concentration as a measure of owners' private benefits of control, and CEO inside ownership and CEO age as measures of managers' private benefits of control. For details, see Section 3.5.

with low private benefits of control following the change from the pre-reform receivership to the post-reform management stay system.

The borrowing and investment decisions of firms may change over time for reasons other than the bankruptcy reform. To sharpen the interpretation of our results, we compare changes in borrowing and investment decisions for firms that are more likely to enter default (risky firms) and are therefore more sensitive to the reform to firms that are less likely to enter default (safe firms) and are therefore less sensitive to the reform in a triple-differences estimation (see, e.g., Becker and Strömberg 2012). We find that borrowing and investment increase for risky relative to safe firms with high private benefits of control after the reform. This implies that firms with high private benefits of control borrow and invest more under the post-reform management stay system compared with the pre-reform receivership system. In contrast, we find that borrowing and investment decrease for risky relative to safe firms with low private benefits of control after the reform. This implies that firms with low private benefits of control borrow and invest more under the pre-reform receivership system compared with the post-reform management stay system.

These results are consistent with the predictions from the model that for firms with low levels of private benefits of control, the more creditor-friendly receivership system spurs more borrowing and investment by relaxing the agency constraint, whereas for firms with high levels of private benefits of control, the more creditor-friendly receivership system discourages borrowing and investment by further tightening the demand constraint.

Another implication of our model is that the effect of stronger creditor protection is particularly strong for firms with high private benefits of control and risky investment projects, which are characterized by higher risk of failure. Consistent with this prediction, we find that firms with high private benefits of control invest less in R&D, generate fewer patents, and exhibit less volatile cash flows under the pre-reform receivership compared with the post-reform management stay system.[4]

We complement our empirical analysis with several robustness tests to strengthen the validity of our results. First, to mitigate concerns that the effect of the global financial crisis on the Korean economy may differentially affect the borrowing and investment decisions of firms with high and low private benefits of control around the reform, we exclude the period during which the Korean economy was affected by the financial crisis from our analysis and find qualitatively identical results. Moreover, we show that changes in firms' borrowing and investment decisions occur sharply in 2006, when the reform first applies, rather than when the financial crisis starts to affect

[4]For firms with low private benefits of control, the model's prediction is ambiguous with respect to more risky investment projects and we find no differential effect of the reform for risky and safe types of investment.

the Korean economy in 2008. In addition, the effects of the reform persist beyond our main sample period several years after the financial crisis ceases to affect the Korean economy. Second, to mitigate concerns that owners' and managers' private benefits of control change endogenously in anticipation of the reform, we sort firms into private benefits of control quintiles 5 years before the reform and find qualitatively identical results. Third, we drop firms associated with business groups (chaebols), since these firms have internal capital markets that isolate them from bankruptcy risk. Again, we find qualitatively identical results. We discuss alternative contracting solutions and other potential effects of the reform in Section 7.

Our analysis contributes to the literature on bankruptcy law and creditor protection. The empirical literature documents that stronger creditor protection can lead to either larger or smaller credit markets. In this paper, we reconcile these seemingly contradictory results by examining conditions under which a more creditor-friendly or a more debtor-friendly bankruptcy code boosts borrowing and investment. We show that firms borrow and invest more under a more creditor-friendly receivership system, which alleviates the impact of credit market frictions when owners and managers face low private benefits of control. In contrast, firms borrow and invest more under a more debtor-friendly management stay system, which increases credit demand when owners and managers have high private benefits of control. More broadly, in an environment with weak incentives in which problems such as moral hazard are first-order, stronger creditor protection boosts borrowing and investment. In contrast, in an environment in which private benefits of control of owners and managers are first-order, a more debtor-friendly bankruptcy regime boosts borrowing and investment.

These insights allow us to rationalize the mixed evidence in the literature on the effects of stronger creditor protection. In contexts in which reforms strengthen creditor protection without significantly increasing owners' and managers' private bankruptcy costs, we observe a positive relationship between creditor protection and borrowing and investment. For example, Becker and Strömberg (2012) find that changes in managers' fiduciary duty to creditors leads to higher leverage, investment, and firm value. Campello and Larrain (2016); Cerqueiro, Ongena, and Roszbach (2016); and Ponticelli and Alencar (2016) show that reforms in Romania, Sweden, and Brazil that made it easier to pledge collateral and better protect secured creditors increase firms' borrowing and investment. In contrast, in the case of a reform in India that strengthens creditor rights and also increases owners' and managers' private bankruptcy costs by encouraging more liquidations, Vig (2013) documents adverse effects on debt usage and firm growth. Moreover, Acharya, Amihud, and Litov (2011) show, in a cross-country study, that not allowing managers to stay in control of the firm during bankruptcy proceedings has a negative effect on corporate risk-taking.

Taken together, these insights have important implications for bankruptcy law design. Our analysis suggests that there is no universally optimal design; rather, optimal bankruptcy law is context-specific. In particular, it may be optimal to apply different degrees of creditor protection to different types of firms, depending on their level of private benefits of control.[5] If firm-specific bankruptcy procedures are infeasible, our analysis has implications for the choice of creditor protection at the country level. The optimal degree of creditor protection for a given country depends on the distribution of relevant firm characteristics in the economy. For example, a more debtor-friendly management stay system may be optimal in a country in which private benefits of control are high. In contrast, a more creditor-friendly receivership system may be optimal in countries in which private benefits of control are low. More broadly, a more creditor-friendly receivership system may be optimal in countries with weak incentives in which agency problems, such as managerial moral hazard, are first-order. In contrast, a more debtor-friendly management stay system may be optimal in countries in which private benefits of control of owners and managers are first-order.

The ability of owners and managers to extract private benefits of control from firms has been recognized as playing an important role in the development of financial markets (La Porta, Lopez-de Silanes, and Shleifer 2000), and they vary widely across firms and countries (Nenova, 2003; Dyck and Zingales, 2004). Yet in spite of their importance, their role in shaping the effect of bankruptcy regulation on firms' borrowing and investment decisions has not been examined explicitly. Our analysis suggests that private benefits of control are an important determinant of the sensitivity of credit market frictions and credit demand to changes in creditor protection, and should therefore be a first-order concern in bankruptcy regulation.

Receivership and management stay are the dominant bankruptcy systems around the world (La Porta et al. 1998). The bankruptcy reform we study offers a unique setting to compare firms' borrowing and investment decisions under the two systems in an otherwise stable institutional environment. Our analysis illustrates the relative advantages of the receivership system in alleviating the impact of credit market frictions and the management stay system in spurring the demand for credit. Additionally, our analysis characterizes conditions under which either system leads to higher equilibrium borrowing and investment.

Risk-taking in pursuit of profitable investment opportunities is a fundamental driver of economic growth (Acemoglu and Zilibotti, 1997; Levine and Zervos, 1998; Kogan et al., 2017). It has long been recognized that managers' risk-aversion may stifle corporate risk-taking (Jensen and

[5] Applying different bankruptcy proceedings to different firms was more common, for example, in Korea before the 2005 Unified Bankruptcy Act and in the U.S. before the 1978 Bankruptcy Reform Act.

Meckling 1976). Our analysis shows that even when owners and managers are risk-neutral, the potential loss of private benefits of control in bankruptcy makes them behave as if they were risk-averse with respect to bankruptcy risk. Stronger creditor protection increases private bankruptcy costs and can therefore lead to a shift from riskier (e.g., innovation) to safer investment projects.

The remainder of the paper is organized as follows. Section 2 describes the institutional setting. Section 3 presents our model and develops testable implications. Section 4 describes the data. Section 5 outlines the empirical strategy to test the model's predictions. Section 6 presents the results and discusses the implications. Section 7 discusses alternative explanations and provides results from robustness tests. Section 8 concludes.

2 Institutional Background

This section describes the legislative history of the Unified Bankruptcy Act (UBA) and the changes it made to corporate bankruptcy proceedings in Korea. In addition, it documents the effects of the reform on bankruptcy filings and outcomes of in-court reorganizations and out-of-court workouts.

2.1 Legislative History

As of April 1, 2006, the UBA replaced four laws that governed corporate liquidation, two corporate reorganization proceedings, and private bankruptcy proceedings. The reform process was triggered by the Asian Financial Crisis in 1997. In exchange for financial support, the IMF and the World Bank demanded, among other things, a modernization of bankruptcy laws in accordance with international best practice, which in essence meant convergence to U.S. bankruptcy law.[6] While other reforms were implemented right after the crisis, the bankruptcy reform was implemented only 8 years after the crisis.

Following minor amendments to bankruptcy proceedings in 1998, the Korean government and the IMF agreed that a comprehensive reform of the bankruptcy law was necessary. In 1999, the Ministry of Justice brought together a group of consultants, led by a Korean (Shin and Kim) and an American (Orrick, Herrington & Sutcliffe) law firm. In December 2000, the group submitted a first draft to the Ministry of Justice. Over the course of the period from 2001 to 2003, the Ministry of Justice circulated different drafts to judges, the Korean bar association, and the bankers' association for consultation. Finally, the National Assembly passed the UBA in March 2005 and it was applied

[6]Other countries affected by the Asian Financial Crisis also underwent bankruptcy reforms in the aftermath of the crisis on the initiative of the IMF (Indonesia in 1998, Thailand in 1998/1999).

from April 1, 2006. As demanded by the IMF and World Bank, the resulting law closely resembled U.S. bankruptcy law.

2.2 Changes in Bankruptcy Law

Before the UBA, corporate restructuring was governed by two separate laws. Under the Composition Act (CA), which was intended for small firms with simple debt structures, a restriction that was strictly applied from 1998 (Park 2005), incumbent management stayed in control of the firm following its bankruptcy filing and developed a plan for restructuring. The firms in our sample are generally too large to qualify for filings under the Composition Act. Under the Corporate Reorganization Act (CRA), a firm's bankruptcy filing triggered the replacement of incumbent management by a court-appointed trustee.[7] It was standard practice for the court-appointed trustee to engage in a sales process upon bankruptcy filing (Ko 2007).

The UBA replaced the CA and CRA. The new corporate reorganization procedure, which is referred to as "rehabilitation" under the new law, conserved most features of the CRA, which effectively meant that the CA was abolished (Ko 2007; Halliday and Carruthers 2009). The major change, compared with the CRA, concerned the treatment of incumbent management during the reorganization process. Whereas under the receivership system of the CRA incumbent management was replaced by a court-appointed trustee, under the new management stay system incumbent management remains in control and negotiates a restructuring plan with the firm's creditors under court supervision. Effectively, instead of appointing an external receiver, the court appointed the incumbent manager as receiver under the UBA.[8]

The UBA had a dramatic effect on firms' owners and managers. Under the post-reform management stay system, the CEO remains in control of the firm in 88.14 percent of the bankruptcy cases in our sample, compared with only 4.76 percent under the pre-reform receivership system (see Table 1, Panel A). Under the pre-reform receivership system, ownership transfer occurred in 90.91 percent of cases that did not result in liquidation, compared with 19.09 percent of cases under the post-reform management stay system.[9] Further, filings for reorganization increased sub-

[7] Park (2008): "The incumbent management might be appointed as a trustee [...], but in practice, there were virtually no cases in which the incumbent management managed to keep their positions."

[8] Incumbent management was not allowed to run the firm during restructuring if financial distress could be attributed to fraudulent activity on the part of incumbent management, creditors provided reasonable grounds for appointing a third-party receiver, or the court considered the appointment of a third-party receiver to be essential. In practice, incumbent management remained in control in virtually all reorganization cases after the reform (Ko 2007).

[9] The effect of the loss of control in bankruptcy can be substantial for managers. For example, Eckbo, Thorburn, and Wang (2016) document that CEOs who stay in management following filing for Chapter 11 in the U.S. experience no change in future compensation, whereas CEOs who are forced to exit the firm experience a combined loss in equity

stantially under the post-reform management stay system, from 57 in 2005 to 117 in 2006 and 215 in 2007 (Table 1, Panel B). In contrast, liquidation filings, which were unaffected by the reform, did not increase during this time period, suggesting that the increase in reorganization filings was not driven by economic conditions.

2.3 Alternative Restructuring Mechanisms

Debtors and creditors have the option to renegotiate the firm's debt obligations outside of court instead of invoking in-court bankruptcy proceedings. While the UBA did not affect the legal framework for firms to restructure their debt outside of court, since both contracting parties have the option to default to in-court bankruptcy proceedings, the expected outcome from in-court proceedings is a benchmark for both parties to reach an agreement outside of court. Due to their private nature, data on out-of-court renegotiations is scarce. In Korea, firms with assets over 50 billion South Korean won (KRW)[10] are required to engage in supervised out-of-court restructuring, called "workouts," under some conditions.

The evidence from the workout sample suggests that creditors were less willing to compromise under the pre-reform receivership system compared with the post-reform management stay system. Under the pre-reform receivership system, creditors in private workouts required the departure of incumbent management and owners in the majority of cases, and private workouts were less likely to succeed (Table 1, Panel C).[11] In 2004, the fraction of workouts that resulted in bankruptcy or liquidation was 60.00 percent, and in 2005 it was 44.58 percent. Under the post-reform management stay system, creditors' willingness to renegotiate out of court increased substantially, and the failure rate dropped to 22.13 percent in 2006 and 25.35 percent in 2007.[12]

3 Theoretical Framework

In this section, we develop a simple stylized model to guide our empirical analysis. The main objective of this exercise is to highlight the forces through which creditor protection affects the

value and forgone future compensation of $18.2 million, which is equivalent to more than 12 times their pre-departure income.

[10] As a rule of thumb, 1,000 KRW equal about 1 U.S. dollar.

[11] In addition, in 2001, even in cases in which the workout did not fail, the CEO was forced to resign in 84 percent of cases (Financial Supervisory Service of Korea).

[12] In general, smaller firms were not required to register their workouts. However, beginning in June 2004, smaller firms were required to register their workout proceedings. The evidence suggests they were largely unsuccessful in restructuring their debt in out-of-court negotiations under the receivership system. *Money Today*, August 8, 2004, "Bank-SME Workouts in Slump."

impact of credit market frictions and credit demand, and to relate them to our empirical analysis.

3.1 Model Setup

There are three dates $t \in \{0,1,2\}$ and no time discounting. There is a firm owned and run by a risk-neutral manager. At $t = 0$, the owner-manager has access to an investment project that costs $I > 0$ at $t = 0$. The owner-manager has no wealth at $t = 0$ and needs to borrow I from risk-neutral lenders to undertake the project. At $t = 1$, the project succeeds with probability p, in which case it generates a cash flow of $R \in [0,\bar{R}]$. If the project fails, it generates no cash flow. Before the investment decision at $t = 0$, the cash flow R is drawn according to the probability density function $f > 0$ and is observable to the owner-manager and the lenders.

The owner-manager's noncontractible effort determines the probability of success p. If the owner-manager shirks, then $p = p_L > 0$. If the owner-manager exerts effort, she incurs a disutility of effort $c > 0$, and p increases to $p = p_H$, where $p_L < p_H < 1$. Define $\Delta p := p_H - p_L$. We assume that p_L is sufficiently low, such that the project's NPV is negative if the owner-manager shirks (i.e., we assume $p_L\bar{R} - I < 0$).

At $t = 1$, the firm can be liquidated with liquidation value $D > 0$, where $D < I$. More generally, D corresponds to the value of the firm under creditor control without the incumbent owner-manager. If the firm is not liquidated at $t = 1$ and continues to date $t = 2$, the owner-manager receives noncontractible private benefits of control $B > 0$ and the firm generates a continuation value $V > 0$. For example, B can capture the owner-manager's nontransferable private benefit from running the firm or a benefit from better future employment opportunities. V can capture the value of future investment opportunities. To focus on interesting cases, we assume that $V + B > D$.

The owner-manager can finance the project's cost I with short-term debt, which stipulates the face value F to be paid to lenders at $t = 1$.[13] In particular, we assume that equity financing is not feasible. Lenders behave competitively in the sense that a loan, if any, makes zero profit. If the firm defaults at $t = 1$ when the project fails, lenders have the right to liquidate the firm and obtain the liquidation value D. However, with probability $\mu \in (0,1)$, the owner-manager obtains a fraction $\alpha > 0$ of the liquidation value D, capturing potential deviations from absolute priority. The random variable that determines whether there is a deviation from absolute priority realizes at $t = 1$ before the liquidation decision.

[13] The assumption of short-term contracts is without loss of generality, since the liquidation decision (see below) can be renegotiated ex post. Thus, whether the owner-manager pledges the date $t = 2$ continuation value V to lenders ex ante or ex post does not affect the qualitative results of the model. The important assumption is that B is noncontractible.

We compare a receivership system ($j = r$) with a management stay system ($j = m$) that differs in μ. In particular, we assume that $\mu_m > \mu_r$–that is, the management stay system has a larger expected deviation from absolute priority compared with the receivership system. We further assume that $(1-\alpha)D < V < D$. As will become clear in the analysis, this assumption implies that the owner-manager has enough pledgeable income to avoid liquidation only if there is a deviation from absolute priority.[14] Define the lenders' expected share of the liquidation value they can obtain by

$$\lambda_j := \mu_j(1-\alpha) + (1-\mu_j),\ j \in \{r,m\}.$$

In particular, we have $\lambda_r > \lambda_m$–that is, lenders are able to obtain a higher expected share of the liquidation value in the receivership system compared with the management stay system.

3.2 Equilibrium

In this section, we study the impact of credit market frictions, credit demand, and equilibrium investment under the receivership system and the management stay system.

3.2.1 Renegotiation

Consider the case in which the owner-manager invests and the firm defaults at $t = 1$. Since $V + B > D$, the owner-manager prefers continuation to liquidation. If there is no deviation from absolute priority, lenders receive D if they liquidate the firm. However, the owner-manager can only offer $V < D$ to avoid liquidation. Hence, lenders liquidate the firm and receive D, and the owner-manager's payoff is equal to 0.

If there is a deviation from absolute priority, lenders receive only $(1-\alpha)D$ if they liquidate the firm. Thus, the owner-manager can renegotiate with lenders to avoid liquidation, since $V > (1-\alpha)D$. As a result, the owner-manager makes a transfer of $(1-\alpha)D$ to lenders, the firm continues, and the owner-manager's payoff is equal to $V + B - (1-\alpha)D$.

In particular, conditional on default, the liquidation probability is given by $1-\mu_j$ and is higher in the receivership system compared with the management stay system, since $1-\mu_r > 1-\mu_m$.

[14] A fixed V is the simplest way to generate this idea. We could equally consider a continuous continuation value $V \in [0, \bar{V}]$, which is drawn according to the probability density function $g > 0$, such that the event $(1-\alpha)D < V < D$ has a positive probability.

3.2.2 Face Value of Debt

Since lenders behave competitively, the lenders' break-even condition determines the equilibrium face value of debt F_j. Assuming that the owner-manager exerts effort ($p = p_H$), the lenders' break-even condition is given by

$$p_H F_j + (1 - p_H)\lambda_j D = I \Leftrightarrow F_j = \frac{I - (1 - p_H)\lambda_j D}{p_H}. \tag{1}$$

In particular, the equilibrium face value F_j is lower under the receivership system compared with the management stay system, because the lenders' expected payoff in default, $\lambda_j D$, is higher under receivership compared with management stay. Note that a higher face value does not increase the cost of credit, since lenders break even–that is,

$$p_H F_r + (1 - p_H)\lambda_r D = p_H F_m + (1 - p_H)\lambda_m D = I.$$

This implies that absent any frictions, the owner-manager's investment decision does not depend on the bankruptcy regime.[15] A higher face value means that lenders are compensated more in the event of success and less in the event of failure. In other words, the difference between the lenders' payoffs in the success and the failure state is lower under receivership compared with management stay; that is, $F_r - \lambda_r D < F_m - \lambda_m D$.

3.2.3 Credit Market Frictions

The loan has to ensure that the owner-manager has a sufficient incentive to exert effort at the equilibrium face value F_j, which is given by (1). Consider a fixed $R \in [0, \bar{R}]$. At F_j, the owner-manager's expected payoff from exerting effort ($p = p_H$) is given by

$$p_H \left(R - F_j + V + B\right) + (1 - p_H)\mu_j(V + B - (1 - \alpha)D) - c.$$

The owner-manager's expected payoff from not exerting effort ($p = p_L$) is given by

$$p_L \left(R - F_j + V + B\right) + (1 - p_L)\mu_j(V + B - (1 - \alpha)D).$$

[15] The model has two frictions. The owner-manager's effort is noncontractible and the owner-manager's private benefits of control B are noncontractible.

The owner-manager's incentive constraint, which we refer to as the "agency constraint," can be written as

$$R - \frac{c}{\Delta p} + (1-\mu_j)(V+B-D) - \big(F_j - \lambda_j D\big) \geq 0. \tag{2}$$

The firm is liquidated with probability $1-\mu_j$ in the event of default, since B is noncontractible. In this case, the owner-manager's loss is given by $V+B-D>0$. We thus refer to $V+B-D$ as bankruptcy costs and to B as the owner-manager's private bankruptcy costs. In particular, an increase in B increases the owner-manager's private bankruptcy costs, which in turn increases the owner-manager's incentive to exert effort, since effort reduces the probability of incurring private bankruptcy costs.

The owner-manager's incentive to exert effort is higher under the receivership system compared with the management stay system for two reasons. First, since $1-\mu_r > 1-\mu_m$, the expected private bankruptcy costs are higher in the receivership system compared with the management stay system, which implies a stronger incentive to exert effort under receivership compared with management stay. Second, as discussed in Section 3.2.2, the face value F_j is lower and the lenders' expected payoff in default $\lambda_j D$ is higher under receivership compared with management stay. This gives the owner-manager a higher payoff in the event of success and a lower payoff in the event of failure under receivership compared with management stay, implying a stronger incentive to exert effort under receivership compared with management stay.

The owner-manager's incentive to exert effort is increasing in the cash flow R. The lowest R for which the owner-manager's incentive constraint is satisfied is given by

$$\frac{c}{\Delta p} - (1-\mu_j)(V+B-D) + \big(F_j - \lambda_j D\big) =: \rho_j^{\mathrm{IC}}(B). \tag{3}$$

Lending thus requires that $R \geq \rho_j^{\mathrm{IC}}(B)$. The threshold $\rho_j^{\mathrm{IC}}(B)$ is decreasing in the owner-manager's private benefits of control B. This implies that the impact of credit market frictions is decreasing in B, capturing the owner-manager's stronger incentive to exert effort due to higher private bankruptcy costs.

Since the owner-manager's incentive to exert effort is higher under the receivership system compared with the management stay system, we have $\rho_r^{\mathrm{IC}}(B) < \rho_m^{\mathrm{IC}}(B)$. This implies that the impact of credit market frictions is lower under receivership compared with management stay.

3.2.4 Credit Demand

Even if the owner-manager is not financially constrained due to the credit market frictions, the owner-manager might be unwilling to invest if expected bankruptcy costs are sufficiently high. Consider a fixed $R \in [0, \bar{R}]$. At the equilibrium face value F_j given by (1), the owner-manager is willing to invest if

$$p_H \left(R - F_j + V + B\right) + (1 - p_H)\mu_j(V + B - (1-\alpha)D) - c \geq V + B,$$

which can be rewritten as

$$p_H R - I - c - (1 - p_H)(1 - \mu_j)(V + B - D) \geq 0. \tag{4}$$

We refer to (4) as the "demand constraint." The first part of the left-hand side of inequality (4), $p_H R - I - c$, is the project's NPV. The second part, $(1 - p_H)(1 - \mu_j)(V + B - D)$, are the expected bankruptcy costs, which arise due to the noncontractibility of B. Thus, the owner-manager is unwilling to invest if expected bankruptcy costs exceed the NPV. In particular, an increase in B increases the owner-manager's private bankruptcy costs, which in turn reduces the owner-manager's willingness to invest.

The owner-manager is less willing to invest under the receivership system compared with the management stay system, since (expected) bankruptcy costs are higher under receivership compared with management stay.

The owner-manager's willingness to invest is increasing in R. The lowest R for which the owner-manager is willing to invest is given by

$$\frac{I + c}{p_H} + \frac{1 - p_H}{p_H}(1 - \mu_j)(V + B - D) =: \rho_j^{\mathrm{PC}}(B). \tag{5}$$

The owner-manager is thus willing to invest if $R \geq \rho_j^{\mathrm{PC}}(B)$. The threshold $\rho_j^{\mathrm{PC}}(B)$ is increasing in the owner-manager's private benefits of control B. This implies that credit demand is decreasing in B, capturing the owner-manager's lower willingness to invest due to higher private bankruptcy costs.

Since the owner-manager's willingness to invest is lower under the receivership system compared with the management stay system, we have $\rho_r^{\mathrm{PC}}(B) > \rho_m^{\mathrm{PC}}(B)$. This implies that credit demand is lower under receivership compared with management stay.

3.2.5 Private Benefits of Control and Equilibrium Investment

As shown, lending requires that $R \geq \rho_j^{\mathrm{IC}}(B)$, where the threshold $\rho_j^{\mathrm{IC}}(B)$ is determined by the owner-manager's incentive constraint (2). The owner-manager is willing to invest if $R \geq \rho_j^{\mathrm{PC}}(B)$, where the threshold $\rho_j^{\mathrm{PC}}(B)$ is determined by the owner-manager's participation constraint (4). Thus, there is investment if the agency constraint is satisfied and there is credit demand–that is, if

$$R \geq \max\left\{\rho_j^{\mathrm{IC}}(B), \rho_j^{\mathrm{PC}}(B)\right\}.$$

Since $\rho_j^{\mathrm{IC}}(B)$ is decreasing in B and $\rho_j^{\mathrm{PC}}(B)$ is increasing in B, there exists a threshold $\bar{B}_j$ such that $\rho_j^{\mathrm{IC}}(B) > \rho_j^{\mathrm{PC}}(B)$ if and only if $B < \bar{B}_j$. In particular, if $B < \bar{B}_j$, the owner-manager's incentive constraint determines equilibrium investment. In contrast, if $B > \bar{B}_j$, the owner-manager's participation constraint, and thus credit demand, determines equilibrium investment. Intuitively, a higher B implies higher private bankruptcy costs, which strengthens the owner-manager's incentive to exert effort but renders her less willing to invest.

Figure 1 plots the agency and demand thresholds $\rho_j^{\mathrm{IC}}(B)$ and $\rho_j^{\mathrm{PC}}(B)$, respectively, for the receivership system ($j = r$) and for the managements stay system ($j = m$). As shown, the impact of credit market frictions is less severe under the receivership system compared with the management stay system due to higher bankruptcy costs, which increase the owner-manager's incentive to exert effort. However, credit demand is lower under the receivership system compared with the management stay system due to higher bankruptcy costs, which reduce the owner-manager's willingness to invest.

Proposition 1. *Assume that $\rho_m^{IC}(B) < \bar{R}$ and $\rho_r^{PC}(B) < \bar{R}$. Let $\bar{B}$ be the intersection point of $\rho_r^{PC}(B)$ and $\rho_m^{IC}(B)$. If $B < \bar{B}$, the probability of investment is higher under the receivership system compared with the management stay system. If $B > \bar{B}$, the probability of investment is lower under the receivership system compared with the management stay system.*

If $B < \bar{B}$, the owner-manager's incentive constraint is the relevant constraint. Since the impact of credit market frictions is less severe in the receivership system compared with the management stay system, the probability of investment is higher under receivership compared with management stay if B is sufficiently low. If $B > \bar{B}$, the owner-manager's participation constraint, which determines credit demand, is the relevant constraint. Since credit demand is lower in the receivership system compared with the management stay system, the probability of investment is lower under receivership compared with management stay if B is sufficiently high.

3.2.6 Risk and Equilibrium Investment

Finally, we consider how risk affects the difference in equilibrium investment between the receivership and the management stay system. We interpret an increase in risk as a reduction in p_H, keeping Δp fixed.[16] We make one additional assumption regarding the cash flow distribution f.

Assumption 1. *The cash flow R is uniformly distributed on* $[0,\bar{R}]$*, that is,* $f = \bar{R}^{-1}$.

We measure the difference in equilibrium investment by the probability of a change in investment when moving from the receivership system to the management stay system. If $B > \bar{B}_m$, the owner-manager's participation constraint determines equilibrium investment under the receivership and the management stay system. In this case, the probability of a change in investment is given by $\mathbb{P}\left(\rho_m^{\mathrm{PC}}(B) \leq R \leq \rho_r^{\mathrm{PC}}(B)\right)$.

Proposition 2. *Let* $\delta > 0$ *such that* $p_L = p_H - \delta$*. Assume that* $\rho_r^{PC}(B) < \bar{R}$*. Then the probability* $\mathbb{P}\left(\rho_m^{PC}(B) \leq R \leq \rho_r^{PC}(B)\right)$ *is increasing in risk.*

In particular, if $B > \bar{B}_m$, the difference in equilibrium investment between the receivership and the management stay system is increasing in risk. Intuitively, an increase in risk increases expected bankruptcy costs more in the receivership system compared with the management stay system, since the liquidation probability conditional on default is higher under receivership compared with management stay. Thus, an increase in risk leads to a larger reduction in credit demand under receivership compared with management stay.

If $B < \bar{B}_m$, the effect of an increase in risk is ambiguous. The reason is that an increase in risk reduces the thresholds $\bar{B}_j$ that determine whether the incentive or the participation constraint determines equilibrium investment.[17] Intuitively, the relevant constraint for a more risky investment project is more likely to be the owner-manager's participation constraint. For example, if $B < \bar{B}_r$, the incentive constraint determines equilibrium investment. However, an increase in risk can make the participation constraint the relevant constraint, and the change in equilibrium investment is negative in the former but positive in the latter case.

[16] A reduction in p_H reduces the project's ex ante NPV: $p_H \mathbb{E}_f[R] - I - c$. To keep the ex ante NPV unchanged, we could additionally consider an upward shift of the support of the distribution of R.

[17] Simple algebra verifies that $\bar{B}_j$ is increasing in p_H keeping Δp constant.

3.3 Safe Firm Benchmark

In this section, we consider a safe firm, which differs from the previous analysis by having assets in place at $t = 0$, which yield a cash flow $S \geq I$ at $t = 1$.[18] This implies that the cash flow of the safe firm at $t = 1$ exceeds I even if the project fails. In particular, the firm can finance the investment with safe debt with face value $F = I$. With safe debt, there is no default if the project fails and no liquidation. In particular, the firm always continues to $t = 2$ and bankruptcy costs are 0. The owner-manager's incentive to exert effort and her willingness to invest are therefore independent of the bankruptcy regime. In particular, investment is independent of the bankruptcy regime.

3.4 Empirical Implications

In this section, we derive testable implications that guide our empirical analysis. In particular, we derive predictions for firms with low private benefits of control (low-B firms) and firms with high private benefits of control (high-B firms) and compare investment in the pre-reform receivership system and the post-reform management stay system.

Since the lenders' expected payoff in default is higher under the receivership system compared with the management stay system, irrespective of the level of the private benefits of control B, the face value of debt is higher for all firms after the reform. If we interpret a higher face value of debt as a higher interest rate, our theoretical framework yields the following testable implication:

Implication 1. *Interest rates for both high-B and low-B firms increase after the reform.*

Investment requires that the owner-manager is not financially constrained and is willing to invest. For low-B firms, the owner-manager's incentive constraint is the relevant constraint. The reform reduces bankruptcy costs, which reduces the owner-manager's incentive to exert effort, and therefore aggravates the impact of credit market frictions. In contrast, for high-B firms, the owner-manager's participation constraint, which determines credit demand, is the relevant constraint. The reduction in expected bankruptcy costs resulting from the reform increases the owner-manager's willingness to invest, and therefore increases credit demand. Together, this implies the following testable implications:

Implication 2. *Borrowing increases for high-B firms after the reform, whereas borrowing decreases for low-B firms after the reform.*

[18] Alternatively, we could consider a safe firm with $p_H = 1$.

Implication 3. *Investment increases for high-B firms after the reform, whereas investment decreases for low-B firms after the reform.*

Finally, an increase in the riskiness of investment increases expected bankruptcy costs more in the receivership system compared with the management stay system. For high-B firms, investment is determined by credit demand, which declines more in the receivership system compared with the management stay system as risk increases. This yields the following implication:

Implication 4. *The reform effect for high-B firms is stronger for more risky investment projects.*

For low-B firms, the effect of an increase in risk is ambiguous. The reason is that while the incentive constraint determines equilibrium investment if B is low, an increase in risk can make the participation constraint the relevant constraint, and the reform effect is negative in the former but positive in the latter case, making the overall effect ambiguous.

3.5 Proxies for B

We use three proxies of owners' and managers' private benefits of control. Our proxy for owners' private benefits of control is the Herfindahl index of ownership (OC). Large blockholders may benefit from private benefits of control, which are large in Korea (Nenova 2003; Dyck and Zingales 2004). In addition, owners whose wealth is concentrated in a given firm are more concerned about idiosyncratic firm risk than diversified investors.

Our first proxy for managers' private benefits of control is inside ownership (IO): the fraction of a firm's stock that is owned by the CEO or her family. Large inside ownership may allow the manager to extract private benefits of control and exposes her to idiosyncratic firm risk, similar to outside owners. In addition, large inside ownership implies that shocks to the manager's labor and financial income become correlated. This makes such managers even more concerned about bankruptcy risk (Jensen and Meckling 1976; Friend and Lang 1988).[19] Our second proxy for managers' private benefits of control is CEO age (CA). Career concerns are more important for young managers, as they stand to significantly reduce a longer time series of future labor income in case of dismissal (Fama 1980). Thus, younger managers have higher private benefits of control than older managers.

[19] Additionally, firms with concentrated ownership and high inside ownership share are often family-owned businesses, which typically have high private benefits of control.

4 Data

This section describes the data we use for the empirical analysis in this paper. We obtain accounting and ownership data from the Korea Information Service (KIS),[20] which also provides data on firms' executives, including their birthdate. This allows us to compute the age of a firm's CEO in any given year. Data on bankruptcy filings are available from KIS. For our analysis, we require ownership data or data on the CEO's age in 2005, the year before the UBA applies. Finally, data on patents are available from the Korea Intellectual Property Rights Information Service (KIPRIS) and include all patent applications and approvals.

We sort firms into quintiles of the level of private benefits of control of their owners and managers in the year before the UBA applies. We use the three proxies for private benefits of control introduced in Section 3.5. Our proxy for owners' private benefits of control is the Herfindahl index of ownership (OC). Our first proxy for managers' private benefits of control is inside ownership (IO): the fraction of the firm owned by the CEO and her family. Our second proxy for managers' private benefits of control is CEO age (CA).

Descriptive statistics are reported in Table 2. We present them separately for firms with high private benefits of control of owners and managers (high-B firms) and firms with low private benefits of control (low-B firms). Panel A reports descriptive statistics from accounting data. Low-B firms are larger and have lower leverage than high-B firms. Both groups of firms pay similar interest rates on their debt, hold similar levels of cash, and exhibit similar levels of investment.[21] Panel B presents patent data and shows that low-B firms are more likely to hold at least one patent and to hold more patents than high-B firms. Panels C and D show information on the three private benefits of control proxies.

5 Empirical Strategy

This section describes the empirical strategy we employ to assess differences in borrowing and investment decisions for firms with different levels of private benefits of control under the pre-reform receivership system compared with the post-reform management stay system. Our empirical analysis is guided by the testable implications in Section 3.4.

[20] Firms with assets of more than 7 billion KRW are required to submit financial statements to the Financial Supervisory Service (FSC), which are available through KIS. Firms that cross the threshold once often continue to report their information, even in years in which they fall below the cutoff. We drop firms that never cross the threshold, but voluntarily provide their accounting information.

[21] We measure interest rates as interest expenses over debt outstanding.

To assess how owners' and managers' private benefits of control affect firms' borrowing and investment decisions under the pre-reform receivership compared with the post-reform management stay system, we estimate

$$Y_{i,t} = \alpha_i + \alpha_{ind,t} + \gamma \cdot controls_{i,t-1} + \beta_1 \cdot B_i + \beta_2 \cdot reform_t + \beta_3 \cdot B_i * reform_t + \varepsilon_{i,t}, \qquad (6)$$

where Y_{it} is the value of the outcome of interest for firm i in year t, $controls_{i,t-1}$ is a set of lagged control variables,[22] B_i is a quintile rank variable ranging from 1 for firms with private benefits of control in the lowest quintile to 5 for firms with levels of private benefits of control in the highest quintile sorted in 2005, the year before the reform applies. The dummy variable $reform_t$ takes the value of 0 before the reform (2001-2005), and 1 after the reform (2006-2010). Firm fixed effects α_i ensure that we track changes for the same firm. Industry-year fixed effects $\alpha_{ind,t}$ control for industry-specific shocks. Standard errors are clustered at the industry level. All results are robust to clustering standard errors at the firm level.

The parameter of interest is β_3, which measures changes in the different outcome variables for high-B relative to low-B firms around the reform. For example, Implication 2 predicts a higher increase in leverage for high-B compared with low-B firms under the post-reform management stay system compared with the pre-reform receivership system, that is, $\beta_3 > 0$.[23]

Estimating equation (6) captures *relative* differences in high-B and low-B firms' borrowing and investment decisions around the reform. To test the empirical predictions for *absolute* differences in high-B and low-B firms' borrowing and investment decisions, we compare changes in their borrowing and investment decisions around the reform with a set of firms that are less sensitive to the reform. Following the literature (see, e.g., Becker and Strömberg 2012), we use safe firms as a control group, which are further from the bankruptcy boundary and are therefore less sensitive to the reform compared with risky firms. This absorbs time-series variation in firms' borrowing and investment decisions unrelated to the reform. Specifically, we estimate

$$Y_{i,t} = \alpha_i + \alpha_{ind,t} + \gamma \cdot controls_{i,t-1} + \delta_1 \cdot risk_i + \delta_2 \cdot reform_t + \delta_3 \cdot risk_i * reform_t + \varepsilon_{i,t}, \qquad (7)$$

separately for high-B and low-B firms, where $risk_i$ is a variable that sorts firms into quintiles of default risk measured by firms' interest coverage, which is a widely used proxy for default risk that can be computed for public and private firms. All other variables are defined as before.

[22] Control variables are standard in the literature and comprise profitability, asset tangibility, lagged sales growth, and firm size for leverage regressions. For interest rate regressions, leverage is added as an additional control variable. Investment regressions also include cash to assets as a control variable.

[23] The other outcome variables we examine are interest rates (IR_{it}), investment to assets ($InvA_{it}$), profit growth ($\Delta\, Profits_{it}$), and different measures of the riskiness of firms' investment.

The parameter of interest is δ_3, which captures the change in outcome variables for firms that are more sensitive to the reform (high default risk firms) relative to firms that are less sensitive the reform (low default risk firms). For example, in leverage regressions, a positive value of δ_3 for high-B firms indicates that risky high-B firms increase their leverage relative to safe high-B firms after the reform. This would imply that high-B firms take on higher leverage under a management stay system compared with a receivership system.

The validity of our empirical analysis relies on several identifying assumptions that we discuss and support in Sections 6 and 7.

6 Results

This section presents and discusses the results from estimating equations (6) and (7) to assess differences in firms' borrowing and investment decisions under the pre-reform receivership and the post-reform management-stay system for firms with different levels of owners' and managers' private benefits of control.

6.1 Interest Rates

We start our analysis by examining changes in interest rates around the reform. Implication 1 states that creditors demand higher interest rates under the post-reform management stay system compared do the pre-reform receivership system regardless of firms' level of private benefits of control. The reason is that creditors experience lower recovery values in default under the post-reform management stay system. The top panel of Figure 2 plots the time series of average interest rates for high-B (black line) and low-B (gray line) firms, which we restrict to firms in the highest two default risk quintiles that are most sensitive to the reform. As a counter factual, we plot the interest rates of all firms in the bottom two default risk quintiles to capture time-series variation in interest rates unrelated to the reform.[24]

Since we measure firms' interest rates as interest expenses over debt outstanding, the full extent of changes in interest rates materializes with a delay. We observe parallel trends in interest rates for all groups of firms before the reform. After the reform, we observe a 30-40 basis point increase in interest rates for high-B and low-B firms compared with the low-risk firms. This suggests that

[24]In the figures, we normalize the outcome variables to 0 in 2005, the year before the reform applies. The figures are based on ownership concentration as a proxy for private benefits of control. The patterns are qualitatively identical when we use the other two proxies.

high-B and low-B firms' interest rates are higher under the post-reform management stay system compared with the pre-reform receivership system, consistent with Implication 1.

To confirm these insights statistically, we estimate equations (6) and (7) with interest rates as the dependent variable. The results from estimating equation (6) are displayed in column I of Table 3. After the reform, interest rates increase by 6 to 12 basis points per quintile of private benefits of control.

The results from estimating equation (7) are shown in columns I and II of Table 5. Column I shows that for high-B firms, interest rates increase by 37 to 45 basis points per risk quintile after the reform. Similarly, the results in column II show that for risky low-B firms, interest rates increase by 24 to 38 basis points per risk quintile after the reform.

Taken together, the evidence on differences in interest rates for high-B and low-B firms under the pre-reform receivership and the post-reform management stay system is consistent with Implication 1 of our theoretical framework. Lower recovery rates in default under management stay induce creditors to demand higher compensation in non-default states, as reflected in higher interest rates.

6.2 Borrowing

Next, we examine changes in leverage around the reform for high-B and low-B firms. Implication 2 predicts that high-B firms increase leverage after the reform, whereas low-B firms reduce leverage after the reform. For high-B firms, the binding constraint is the demand constraint. Since private bankruptcy costs are lower under the management stay system, managers are more willing to take on higher leverage compared with the receivership system. For low-B firms, the binding constraint is the agency constraint. Since the management stay system weakens managers' incentives to exert effort, low-B firms are more financially constrained under the management stay system compared with the receivership system.

The top panel of Figure 3 plots the time series of leverage. High-B, low-B, and safe firms show parallel trends in leverage before the reform. Consistent with Implication 2 from our theoretical framework, we observe a 2 percentage point increase in leverage for high-B firms compared with safe firms after the reform. In contrast, leverage drops by about 2 percentage points for low-B firms compared with safe firms after the reform. The bottom panel of Figure 3 shows that the change in leverage after the reform increases monotonically with firms' private benefits of control.

We confirm the insights from the graphical analysis statistically by estimating equations (6) and

(7) with leverage as the dependent variable. The results from estimating equation (6) are displayed in column II of Table 3. The results indicate that leverage increases by 0.33 to 0.59 percentage points per quintile of private benefits of control under the post-reform management stay system. This implies that firms in the highest private benefits of control quintile experience a 1.32-2.36 percentage point increase in leverage compared with firms in the lowest private benefits of control quintile under post-reform management stay relative to the pre-reform receivership system.

The results from estimating equation (7) are shown in columns III and IV of Table 5. Column III shows that for high-B firms, leverage increases by 0.69 to 1.37 percentage points per risk quintile after the reform. Similarly, the results in column IV show that for risky low-B firms, leverage decreases by 0.55 to 1.04 percentage points per risk quintile after the reform. Together, this suggests that high-B firms borrow more under the post-reform management stay system, whereas low-B firms borrow more under the pre-reform receivership system.

Together, the results suggest that while high-B firms take on higher leverage under the post-reform management stay system, low-B firms have higher leverage under the pre-reform receivership system. The combination of higher quantity (leverage) and higher price of credit for high-B firms under management stay suggests that higher leverage is driven by a higher demand for credit, consistent with the management stay system relaxing the demand constraint. In contrast, the combination of lower quantity (leverage) and higher prices for low-B firms suggests that lower leverage under the management stay system is driven by an increase in firms' financial constraints, consistent with a tightening of the agency constraint under management stay.

These contrasting results show that whether the agency or the demand effect dominates in equilibrium depends on the level of private benefits of control at the firm level, which may explain the mixed evidence in the literature (e.g. La Porta et al. 1997, 1998; Acharya, Amihud, and Litov 2011) and has important implications for bankruptcy law design, which we discuss in Section 6.5.

6.3 Investment

Next, we examine changes in investment for high-B and low-B firms around the reform. Implication 3 states that high-B firms invest more under the post-reform management stay system, due to lower private bankruptcy costs, whereas low-B firms, who experience an increase in the impact of credit market frictions under the post-reform management stay system, reduce investment.

Figure 4 plots the time series of firms' investment to assets ratios around the reform. While we observe parallel trends in investment for all groups of firms before the reform, investment increases

for high-*B* firms compared with safe firms, whereas investment declines for low-*B* firms compared with safe firms after the reform. The bottom panel of Figure 4 shows that the increase in investment after the reform increases monotonically with firms' private benefits of control.

We confirm the insights from the graphical analysis statistically by estimating equations (6) and (7) with investment to assets as the dependent variable. The results from estimating equation (6) are displayed in column III of Table 3. The results show that investment increases by 23 to 50 basis points per private benefits of control quintile after the reform. This implies that firms in the highest private benefits of control quintile experience a 0.92-2.00 percentage point increase in investment compared with firms in the lowest private benefits of control quintile under the post-reform management stay relative to the pre-reform receivership system.

The results from estimating equation (7) are shown in columns V and VI of Table 5. Column V shows that for high-*B* firms, investment increases by 47 to 64 basis points per risk quintile after the reform. Similarly, the results in column VI show that for risky low-*B* firms, investment decreases by 37 to 52 basis points per risk quintile after the reform. Together, this suggests that high-*B* firms invest more under the post-reform management stay system, whereas low-*B* firms invest more under the pre-reform receivership system.

Whether higher investment is desirable depends on the efficiency of the additional investment. A receivership system may prevent firms from engaging in overinvestment and risk-shifting (Jensen 1986; Harris and Raviv 1990; Skeel 1993; Zwiebel 1996) by increasing owners' and managers' private bankruptcy costs. Alternatively, high private bankruptcy costs under a receivership system may lead to underinvestment in positive NPV projects that involve risk (Donaldson 1969; Amihud and Lev 1981; Rasmussen 1994).

It is important to emphasize that it is challenging to evaluate the efficiency of corporate investment. To provide suggestive evidence on the efficiency of the additional investment of high-*B* firms under the post-reform management stay system and of low-*B* firms under the pre-reform receivership system, we examine differences in firms' profits by estimating equations (6) and (7) with profit growth as the dependent variable.

The results from estimating equation (6) are displayed in column V of Table 3. We find that profit growth is higher for high-*B* firms than for low-*B* firms under the management stay system by 10 to 14 basis points per private benefits of control quintile. This implies that the firms in the highest private benefits of control quintile experience a 40-56 basis point increase in profit growth compared with firms in the lowest private benefits of control quintile under the post-reform management stay system relative to the pre-reform receivership system.

The results from estimating equation (7) are shown in columns VII and VIII of Table 5. Column VII shows that for high-B firms, profit growth increases by 25 to 45 basis points per risk quintile after the reform. Similarly, the results in column VIII show that for risky low-B firms, profit growth decreases by 60 to 77 basis points per risk quintile after the reform. These results suggest that higher investment of high-B firms under the post-reform management stay system and of low-B firms under the pre-reform receivership system goes to positive NPV investment projects.

Taken together, the evidence on firm investment suggests that a more debtor-friendly management stay system leads firms with high levels of private benefits of control to increase investment in profitable projects they are unwilling to undertake under a more creditor-friendly receivership system, since private bankruptcy costs are high. In contrast, firms with low levels of private benefits of control invest more in profitable projects under a more creditor-friendly receivership system as a consequence of the lower impact of credit market frictions.

6.4 Risk-Taking

Finally, Implication 4 predicts that investment for high-B firms increases more for riskier investment projects after the reform. Intuitively, since private bankruptcy costs occur when firms default, their impact on firms' borrowing and investment decisions is particularly salient for projects that exhibit high risk of failure. Thus, the relaxation of the firm's demand constraint through the reduction in private bankruptcy costs under the post-reform management stay system matters more for high-risk projects. For low-B firms, the effect of an increase in risk is ambiguous. The reason is that while the agency constraint determines investment for low-B firms, an increase in risk can make the demand constraint the relevant constraint, and the reform effect is negative in the former but positive in the latter case, making the overall effect ambiguous.

In Table 4, we examine relative changes in risk-taking for high-B and low-B firms around the reform. The results in column I show that R&D spending as a fraction of assets increases by 14 to 17 basis points per private benefits of control quintile after the reform. The results in columns XI and XII in Table 5 show that the relative increase in risk-taking under the post-reform management stay system is driven by an increase in risk-taking by high-B firms, whereas risk-taking remains unchanged for low-B firms after the reform.

The increase in R&D spending is not simply a result of the overall increase in investment for high-B firms. In Table 4, column II, we find that firms increase R&D spending as a fraction of total investment by 2.87 to 7.46 percentage points per private benefits of control quintile. Firms also increase innovation output with an additional increase of 0.0017 to 0.0021 patents per billion

KRW of assets, or 6.1-7.5 percent relative to the mean (0.0279), per private benefits of control quintile (column III). Finally, we directly measure changes in risk by comparing firms' cash flow volatility in the 5 years before and the 5 years after the reform in column IV. We observe a 1.87 to 4.47 percent increase in cash flow volatility per private benefits of control quintile after the reform.

Altogether, these results are consistent with Implication 4. For high-*B* firms, management stay increases investment in risky projects compared with receivership. In contrast, for low-*B* firms, the riskiness of investment is similar under management stay and receivership.

6.5 Implications

In this section, we summarize the economic implications of our results.

Our results have important implications for optimal bankruptcy law design. As we outline in our model and document in the empirical analysis, whether the agency constraint or the demand constraint binds may vary with firm characteristics. Specifically, our results suggest that for firms with high private benefits of control, the relevant constraint is the demand constraint, and we observe higher borrowing and investment under the more debtor-friendly management stay system. In contrast, for firms with low levels of private benefits of control the binding constraint is the agency constraint and we observe more borrowing and investment under the more creditor-friendly receivership system.

While our analysis focuses on cross-sectional differences in private benefits of control due to the importance of this parameter in the literature (Dyck and Zingales, 2004), the same argument applies to any characteristic that determines which of the two constraints is binding. For example, as we show in our model, the demand constraint tends to be binding for high-risk projects. This implies that a more debtor-friendly bankruptcy regime may increase borrowing and investment in industries characterized by risky investment projects (e.g., high R&D intensity).

Moreover, the relative importance of the agency and demand effects may vary across countries. For example, in countries with high corporate governance standards or a large fraction of firms with diversified owners, and therefore low private benefits of control (e.g., the UK), the demand constraint may be binding less often compared with the agency constraint, and a more creditor-friendly bankruptcy regime may encourage more borrowing and investment. In contrast, in countries with lower governance standards and more closely held firms, and therefore high private benefits of control (e.g., India), the demand constraint may be binding more often and a more debtor-friendly bankruptcy regime may encourage more borrowing and investment.

This further implies that it may be optimal to apply different bankruptcy systems to firms with different characteristics or that different systems may be optimal in different institutional environments (e.g., in different countries), depending on which constraint is more likely to bind. This is consistent with different bankruptcy systems being observed around the world and within-country differences in applicable bankruptcy rules–for example, before the UBA in Korea and before the Bankruptcy Reform Act of 1978 in the US.[25]

In our model, the positive agency effect of stronger creditor protection is based on a moral hazard in effort problem between firm insiders and outside investors. Specifically, the owner-manager's financial constraint is governed by whether her incentive constraint is satisfied. While the incentive constraint describes the owner-manager's incentive to exert effort in our model, the general insight applies more broadly to other frictions–for example, concerns about strategic default. The negative demand effect of stronger creditor protection is based on private bankruptcy costs that arise due to private benefits of control. Specifically, the demand for credit is governed by whether the owner-manager's participation constraint is satisfied. While the participation constraint describes the owner-manager's concern about the loss of private benefits of control, the general insight applies more broadly to other frictions–for example, a liquidation bias of creditors.

7 Discussion and Robustness Tests

This section discusses alternative contracting solutions to reduce potential inefficiencies arising from the bankruptcy system, addresses potential concerns about confounding events or measurement errors, and discusses additional potential effects of the reform.

7.1 Alternative Contracting Solutions

We first discuss alternative contractual arrangements, which may undo the effects of the bankruptcy system on firms' borrowing and investment decisions, and discuss their limitations.

7.1.1 Alternative Financing Sources

In our model, firms can only use risky debt to finance the investment project, which leads to private bankruptcy costs due to the noncontractibility of the owner-manager's private benefits of control. A natural question is whether firms could mitigate bankruptcy costs by financing additional invest-

[25] Table A.1 provides information about management stay provisions across a broad range of countries.

ment with equity. There are several reasons why firms issue debt rather than equity. First, equity financing might be costly or infeasible due to information asymmetries (Myers and Majluf 1984) or large fixed costs. Second, issuing outside equity might reduce the private benefits of control of firm insiders, which are particularly large in the context of Korean firms (Nenova 2003; Dyck and Zingales 2004). Similarly, new outside owners might be unwilling to become minority owners in firms in which insiders can extract large private benefits of control. Third, debt has a tax advantage compared with equity, which makes it a more attractive source of financing. Moreover, even if firms use equity to finance a large portion of their operations, they typically have debt-like obligations such as employee wages, which, if not honored, can lead to financial distress.

An alternative way to finance an investment project is to sell assets. While asset sales may be a feasible source of financing in some cases, there are limitations. Firms may not have enough non-core assets that can be sold without affecting the firm's operations. Further, asset sales are regularly prohibited by existing debt contracts. Thus, while in some cases financing new investment with asset sales might be feasible, firms face constraints in their ability to liquidate assets for new investment.

Taken together, while alternative forms of financing might be available, in many cases it might be prohibitively costly or infeasible to use outside equity or asset sales to finance investments.

7.1.2 Compensation Contracts

In cases in which ownership and control are separated, conflicts of interest between owners and managers may arise. In particular, if the manager has high private benefits of control, she might be unwilling to invest due to the high private bankruptcy costs. In contrast, if owners have lower private benefits of control, they might prefer to invest. One potential solution to this problem is to compensate the manager for her private bankruptcy costs. While this might be feasible in some cases, the cost of compensating the manager for the expected loss of her high private benefits of control might make it unprofitable for owners to invest.

In addition, if the manager has low private benefits of control, the firm might be unable to obtain credit due to the manager's lack of incentives to exert effort. Owners could use contracts to increase the incentive of the manager to exert effort. However, if the manager has limited wealth or is protected by limited liability, there are limits to creating such incentives. It might therefore be too costly to generate sufficiently strong incentives. In general, contractual arrangements might therefore not be able to resolve the manager's incentive problem.

7.2 Confounding Events and Robustness Tests

Next, we consider the possibility of confounding events that coincide with the bankruptcy reform in Korea in 2006 and discuss concerns regarding potential measurement errors.

7.2.1 Confounding Events

In any empirical study that relies on one main event, an important consideration is whether confounding events occur around the same time period. In our case, for such confounding events to be able to explain all of our results, they need to differentially affect firms sorted into groups with high and low levels of private benefits of control and risky and safe firms.

First, to assess the relative effect of the reform on firms with different degrees of private benefits of control, we sort firms into quintiles of three proxies based on ownership concentration, inside ownership, and CEO age. To bias our results, a confounding factor would need to differentially affect firms with more concentrated ownership, higher inside ownership, and older CEOs. It is hard to think about this type of variation apart from a specific reform. We are not aware of any such reform being implemented in Korea in or around 2006.

Second, our analysis of absolute changes in interest rates, leverage, and investment relies on the comparison of riskier firms that are more sensitive to the bankruptcy reform and safer firms that are less sensitive to the reform. The most salient event that occurred during our sample period that could differentially affect risky and safe firms is the global financial crisis. While the financial sector in Korea was not directly affected through exposure to subprime-related RMBS and CDOs, as an export-dependent economy, Korea experienced lower growth rates in 2008 and 2009. In 2010, growth rates were back to pre-2008 levels.

Several pieces of evidence suggest that the financial crisis does not affect our analysis. First, we find that all outcome variables diverge for risky high-B and low-B firms and safe firms sharply in 2006, when the bankruptcy reform applies, rather than in 2008, when the global financial crisis starts to affect the Korean economy (see Figures 2 to 4). Additionally, we do not observe detectably different patterns during the crisis years of 2008 and 2009. Moreover, when we extend the analysis to 2013, we find that the patterns persist well beyond the 2008-2009 period. Second, with the exception of interest rates, we do not observe systematically different patterns for safe and risky firms after the reform.

To formally assess whether our results are affected by the 2008-2009 period, we replicate our analysis excluding the period from 2008 to 2009, during which the Korean economy was affected

by the financial crisis, in Tables A.2 and A.3. Removing the 2008-2009 period has no material effect on our results. Together with the timing of the effects and the persistence beyond our main sample period, this suggests that the effect of the financial crisis on the Korean economy does not explain the patterns in firms' borrowing and investment decisions around the reform.

7.2.2 Anticipation of the Reform

The bankruptcy reform process spanned several years before the reform applied in 2006. Anticipating the reform, firms may have endogenously altered their ownership structure or CEO incentives. This could affect our estimates–for example, if firms with risky investment opportunities hire younger CEOs before the reform, anticipating that high private benefits of control are less likely to constrain risky investment under the post-reform management stay system.

From the outset, it should be noted that the private benefits of control proxies based on ownership and CEO age are highly persistent in the data. To formally address concerns that firms endogenously alter their ownership structure or CEO hiring in anticipation of the reform, we resort firms into quintiles of private benefits of control according to our proxies in 2001–5 years before the reform was applied–and estimate equations (6) and (7) based on the earlier sorting. The results in Tables A.4 and A.5 show that the earlier sorting of firms leaves the results virtually unaffected, which is not surprising given the persistence of the variables underlying the private benefits of control proxies. This suggests that our results are not affected by endogenous sorting of firms with respect to private benefits of control.

7.2.3 Chaebols

A non trivial share of firms in Korea belong to business groups (chaebols). Since these firms may be insulated from default risk through their business groups' internal capital markets (Gopalan, Nanda, and Seru 2007), sorting them into default risk quintiles without taking into account business group affiliations may bias our results. For example, firms belonging to a business group may look like high-B firms based on their concentrated ownership, and some of them may be classified as risky firms based on the interest coverage measure. Such misclassification should lead to an attenuation bias by sorting firms into groups that are sensitive to the reform when in fact they are not.

To formally assess the possibility that misclassifying firms belonging to business groups affects our estimates, we repeat our analysis excluding all firms in the sample that have ownership by another firm. The results are gathered in Tables A.6 and A.7. Excluding firms connected to business

groups overall renders the results somewhat stronger, consistent with the misclassification of these firms leading to an attenuation bias.

7.3 Additional Reform Effects

Finally, we discuss additional channels through which the reform may affect firms' borrowing and investment decisions separate from its effect on private benefits of control.

7.3.1 Firm-specific Human Capital

Managers may develop firm-specific human capital over time; for example, by gathering important information about the firm they are running. In this case, a potential reason why firms are reluctant to take on higher leverage and increase firm risk under the pre-reform receivership system could be that managers' firm-specific human capital is lost under forced resignation. In the framework of our model, firm-specific human capital can be interpreted as the continuation value of the firm (V), which is more likely to be lost under the receivership system.

Several observations from the outcome of corporate restructuring, both in court and out of court, are inconsistent with managers' firm-specific human capital being an important consideration. First, under the receivership system, the receiver or the new owners of the firm face no restriction in reappointing the previous manager. Indeed, in our model, the owner-manager and lenders renegotiate in the event of default and can avoid the loss of V. However, in the data, we do not observe a single case in which a firm reappoints the old manager in the pre-reform restructuring cases. This is not consistent with the view that managers have an important positive effect on firm value due to the firm-specific human capital they develop. Similarly, even in out-of-court restructurings, creditors demand the replacement of incumbent management in the majority of cases, which is further inconsistent with firm-specific human capital of incumbent management being a first-order concern for firm value.

7.3.2 Excessive Liquidation

Under the pre-reform receivership system, it is easier for creditors to liquidate bankrupt firms. If creditor control leads to excessive liquidation, firms' demand for credit could be reduced.[26] Since the additional liquidations would be more costly for firms in which owners and managers have

[26]Creditors have a fixed claim on the firm and do not take into account the residual value on the upside potential of risky investment opportunities that accrues to the firm (Ma, Tong, and Wang 2019).

high private benefits of control, this channel could reduce the demand for credit by high-B firms under the pre-reform receivership system. Note that this is exactly the channel we propose in this paper, which requires the presence of private benefits of control that are noncontractible.

Additionally, the design of the pre-reform receivership system in Korea makes it unlikely that excessive liquidations play a major role. Under the pre-reform receivership system, if the firm is not liquidated, creditors are compensated from the proceeds of the sale of bankrupt firms to new investors. Since the new owners of the firm have the option to preserve the firm as a going concern, the purchase price of the firm should reflect the upside potential of firms' investment opportunities. Thus, creditors benefit from the upside potential of firms' investment opportunities through the sale process under the pre-reform bankruptcy proceedings. Creditors even have the option to take over the firm, if they think that a residual claim on the assets of the firm is more valuable than their fixed claim, which we occasionally observe in the data.

8 Conclusion

In this paper, we examine differences in the borrowing and investment decisions of firms with different levels of private benefits of control under a more creditor-friendly receivership system and a more debtor-friendly management stay system. Theoretically, we show that stronger creditor protection leads to a tradeoff. On the one hand, the more creditor-friendly receivership system reduces the impact of credit market frictions by mitigating agency conflicts between creditors and owners or managers. On the other hand, when owners and managers generate high private benefits of control, the more creditor-friendly receivership system implies high private bankruptcy costs for owners and managers, which in turn reduces firms' demand for credit. Which of these effects dominates in equilibrium depends on the relative importance of agency problems and private benefits of control. Hence, for firms with high levels of private benefits of control, the demand effect dominates and firms borrow and invest more under the management stay system. For firms with low levels of private benefits of control, the agency effect dominates and firms borrow and invest more under the receivership system.

We find empirical support for these predictions by exploiting a reform in Korea that changed the bankruptcy system from a receivership to a management stay system in 2006. Beyond the specific context of our analysis, our insights reconcile the mixed empirical evidence on the relationship between creditor protection and the size of credit markets. In contexts in which reforms strengthen creditor protection without significantly altering owners' and managers' private bankruptcy costs,

the literature finds a positive relationship between creditor protection and borrowing and investment. For example, Becker and Strömberg (2012) find that changes in managers' fiduciary duty to creditors in distressed firms leads to higher leverage, investment, and firm value. Campello and Larrain (2016) show that a reform in Romania that made it easier to pledge movable assets as collateral increased firms' borrowing and investment. Similarly, Cerqueiro, Ongena, and Roszbach (2016) document that a reform in Sweden that reduced collateral values led to lower credit supply, and Ponticelli and Alencar (2016) show that better protection of secured creditors in Brazil increased the volume of secured loans and firms' investment. In contrast, in contexts in which reforms strengthen creditor protection–but also significantly affect owners' and managers' private bankruptcy costs–the literature documents a negative relationship between creditor protection and borrowing and investment. For example, Vig (2013) documents adverse effects on debt usage and firm growth for a reform in India that made it more profitable for creditors to liquidate firms, which imposes high private bankruptcy costs on owners and managers in an environment with high private benefits of control. This is also consistent with the findings of Acharya, Amihud, and Litov (2011), who show in a cross-country study that not allowing managers to stay in control of the firm during bankruptcy proceedings has a negative effect on corporate risk-taking.

Taken together, our analysis provides important insights for optimal bankruptcy design, which has been an important part of the policy agenda in many countries and international organizations in recent years. Our analysis suggests that the optimal design of bankruptcy law is context-specific and depends on a tradeoff between reducing the impact of credit market frictions and sustaining credit demand. The main contribution of our paper is to shed more light on the nature of this tradeoff. As we document, the balance of the tradeoff varies across different types of firms, and therefore also across countries with different distributions of firm types. This insight raises a question: Which other firm or institutional characteristics affect this tradeoff? Further work in this area is important to inform policymakers.

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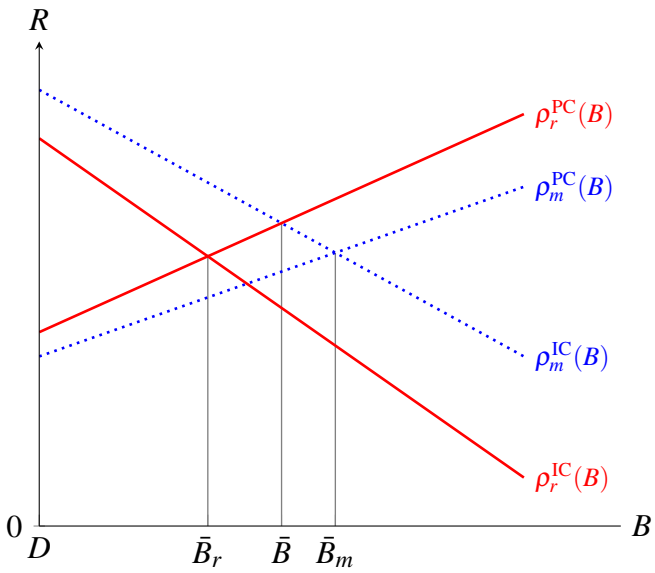
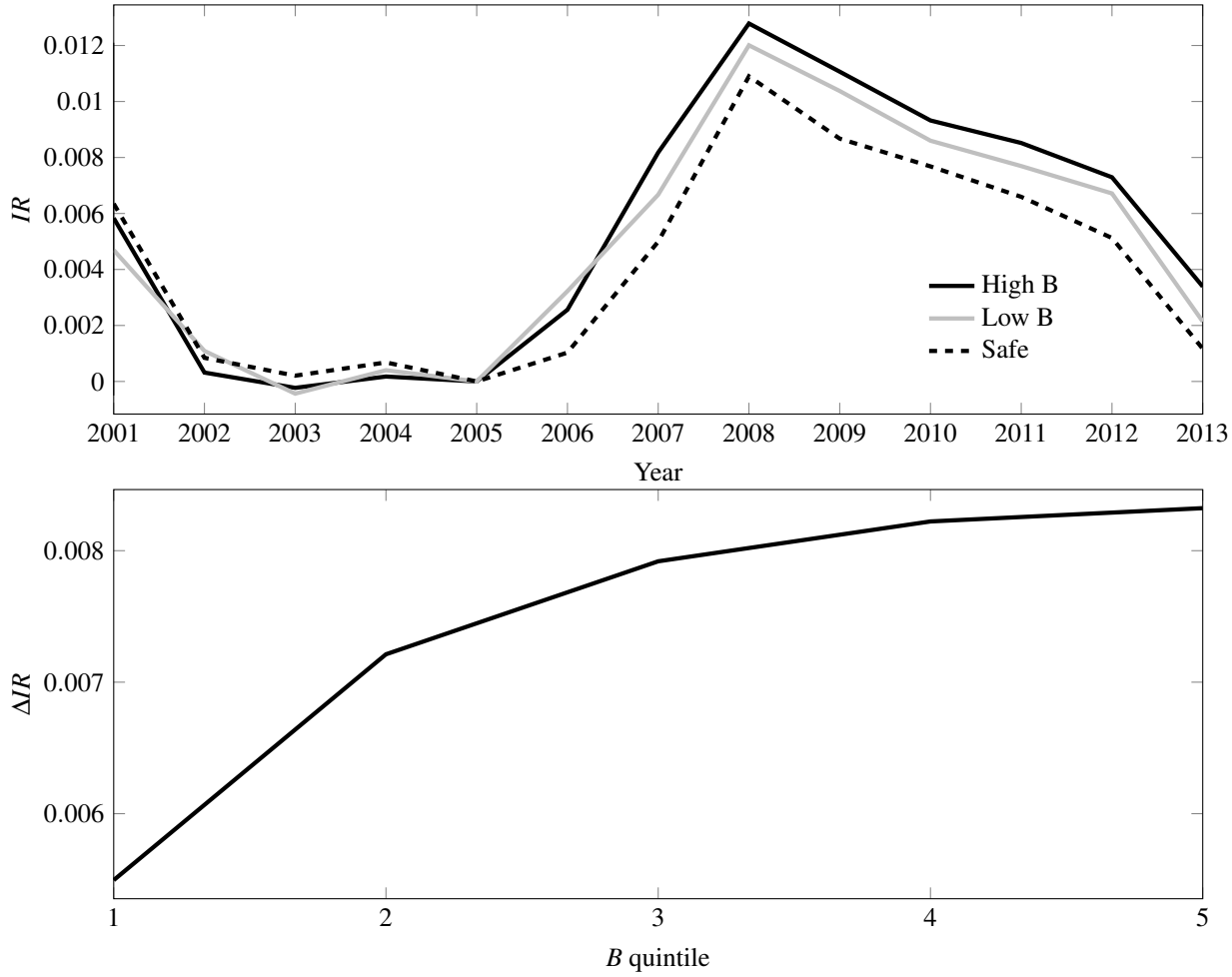
Figure 1: Agency and Demand Thresholds



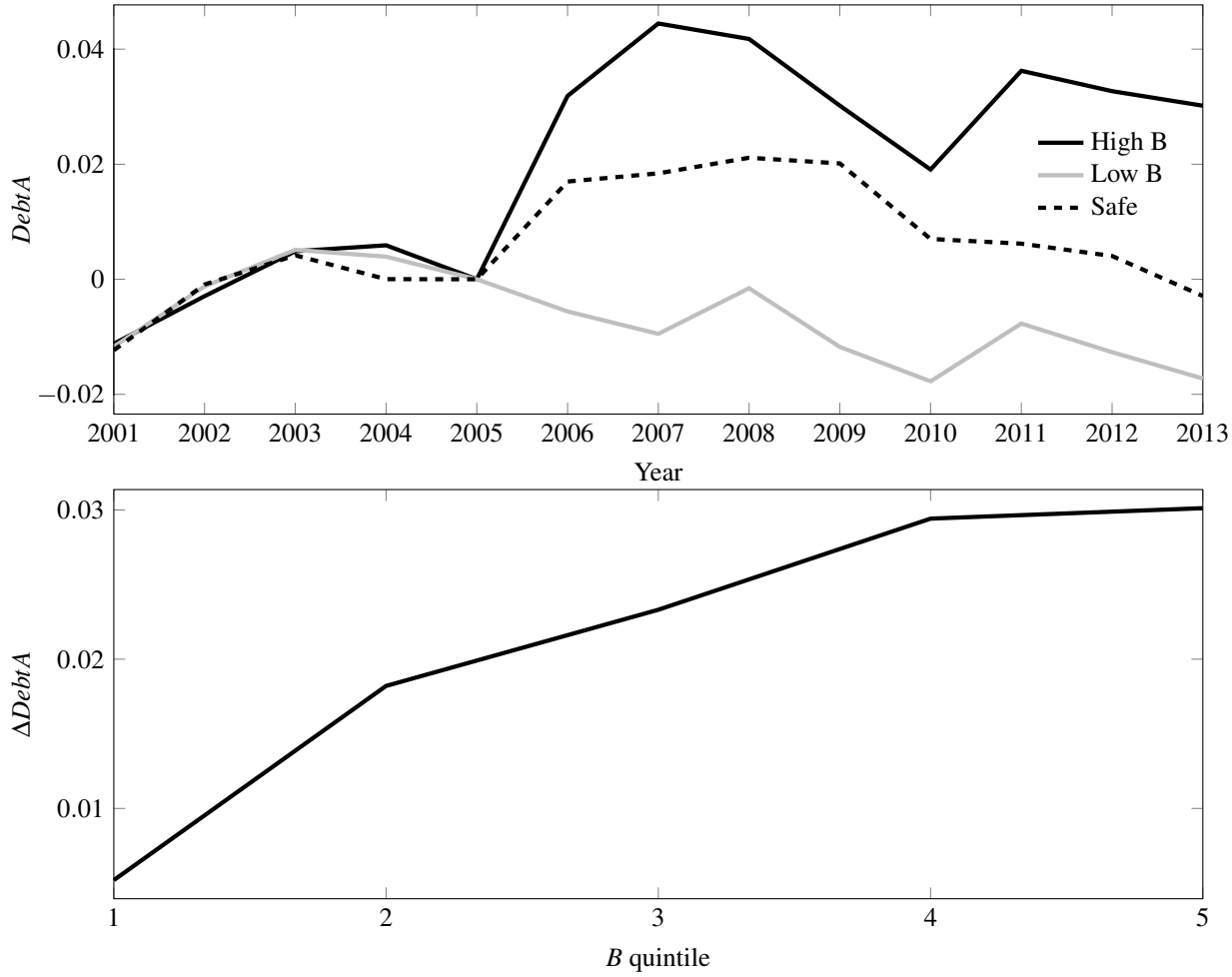
The figure plots the thresholds $\rho_j^{IC}(B)$ and $\rho_j^{PC}(B)$ from equations (3) and (5), respectively, for the receivership system ($j = r$) and for the management stay system ($j = m$). For the receivership system (red lines), $\rho_r^{IC}(B)$ is the agency constraint and $\rho_r^{PC}(B)$ is the demand constraint, where $\bar{B}_r$ is their crossing point. For the management stay system (blue dotted lines), $\rho_m^{IC}(B)$ is the agency constraint and $\rho_m^{PC}(B)$ is the demand constraint, where $\bar{B}_m$ is their crossing point. $\bar{B}$ is the crossing point of $\rho_m^{IC}(B)$ and $\rho_r^{PC}(B)$.

Figure 2: Interest Rates



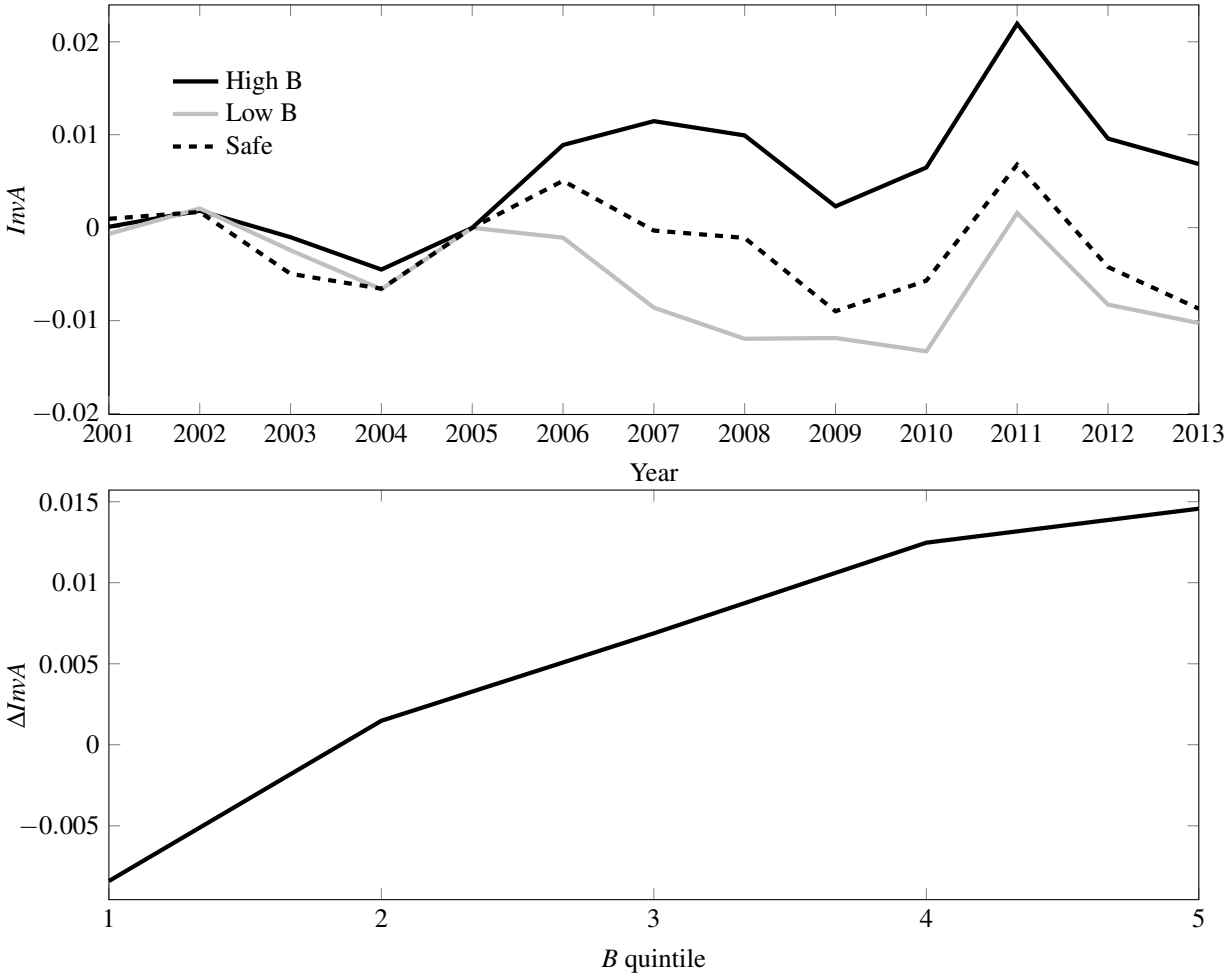
The top panel plots the time series of firms' average interest rates around the reform for firms in the two highest quintiles of private benefits of control and risk (black line), firms with low private benefits of control in the top two risk quintiles (gray line), and all firms in the bottom two risk quintiles (dashed line). The bottom panel plots the average change in interest rates between the post- and pre-reform periods for firms in different private benefits of control quintiles, from 1 for the lowest up to 5 for the highest quintile of private benefits of control.

Figure 3: Leverage



The top panel plots the time series of firms' average leverage around the reform for firms in the two highest quintiles of private benefits of control and risk (black line), firms with low private benefits of control in the top two risk quintiles (gray line), and all firms in the bottom two risk quintiles (dashed line). The bottom panel plots the average change in leverage between the post- and pre-reform periods for firms in different private benefits of control quintiles, from 1 for the lowest up to 5 for the highest quintile of private benefits of control.

Figure 4: Investment



The top panel plots the time series of firms' average investment to asset ratios around the reform for firms in the two highest quintiles of private benefits of control and risk (black line), firms with low private benefits of control in the top two risk quintiles (gray line), and all firms in the bottom two risk quintiles (dashed line). The bottom panel plots the average change in investment between the post- and pre-reform periods for firms in different private benefits of control quintiles, from 1 for the lowest up to 5 for the highest quintile of private benefits of control.

Table 1: Bankruptcy Filings and Workouts

Panel A: Bankruptcy Outcomes (Sample Firms)	I All filings	II Composition (pre-reform)	III Reorganization (pre-reform)	IV Reorganization (post-reform)
Number of filings	421	25	42	354
Share liquidation (%)	36.34	60.00	26.19	35.88
Duration (months)	41.98	56.56	34.12	41.88
CEO stay (%)	79.81	88.00	4.76	88.14
Ownership transfer (%)	30.71	25.00	90.91	19.09

Panel B: Bankruptcy Filings (Administrative Data) Year	I Composition	II Reorganization	III Liquidation
2001	51	31	170
2002	29	28	108
2003	48	38	303
2004	81	35	162
2005	35	22	129
2006		117	132
2007		215	132
2008		582	191
2009		1,192	226
2010		1,227	253

Panel C: Workouts (Administrative Data) Year	I Total Cases	II Successful	III Failed	IV Failure Rate
2004-Q4	360	144	216	0.6000
2005	581	322	259	0.4458
2006	1,491	1,161	330	0.2213
2007	1,353	1,010	343	0.2535
2008	1,219	771	448	0.3675

Panel A displays outcomes of corporate reorganization cases for all sample firms. The information comprises the number of filings, share of cases ending in liquidation, duration of the proceedings, probability of the CEO to stay in control throughout the proceedings, and the fraction of cases that do not end in liquidation with ownership transfer. Panel B lists administrative data on the number of composition, reorganization, and liquidation filings from 2001 to 2010 in Korea. Panel C lists administrative data on workouts, including the number of cases (column I) either successfully resolved (column II) or resulting in bankruptcy or liquidation (column III).

Table 2: Descriptive Statistics

		High-*B* Firms				Low-*B* Firms			
	Proxy	Obs	Mean	Median	Std	Obs	Mean	Median	Std
Panel A: Accounting Data									
Total assets (in million KRW)	OC	39,802	26,972	13,056	34039	41,265	32,154	14,073	39,280
	IO	37,502	22,164	11,581	28401	42,024	35,739	15,285	42,352
	CA	28,254	22,495	10,948	30,400	30,771	35,642	16,531	40,825
Debt to assets	OC	39,754	0.2878	0.2557	0.2559	41,214	0.2286	0.2515	0.2395
	IO	37,418	0.3343	0.3056	0.2776	41,999	0.2568	0.2175	0.2289
	CA	28,206	0.3042	0.2791	0.2551	30,753	0.2847	0.2538	0.2386
Interest rates	OC	34,211	0.0484	0.0425	0.0363	37,493	0.0534	0.0466	0.0379
	IO	32,633	0.0516	0.0446	0.0386	37,450	0.0517	0.0452	0.0376
	CA	24,889	0.0518	0.0449	0.0383	27,690	0.0501	0.0446	0.0352
Cash to assets	OC	37,972	0.0768	0.0338	0.0991	39,788	0.0718	0.0334	0.0926
	IO	35,224	0.0695	0.0268	0.0958	40,658	0.0787	0.0389	0.0972
	CA	26,711	0.0836	0.0384	0.1041	29,902	0.0625	0.0283	0.0840
Net investment to assets	OC	37,420	0.0331	-0.0015	0.1175	39,459	0.0360	-0.0010	0.1196
	IO	34,539	0.0293	-0.0013	0.1142	40,370	0.0402	-0.0008	0.1244
	CA	26,340	0.0468	-0.0001	0.1298	29,712	0.0245	-0.0033	0.1081
Panel B: Patent Data									
Number of patents	OC	4,122	3.57	2.00	4.56	6,497	3.97	2.00	5.00
	IO	2,762	2.85	2.00	3.44	7,196	4.28	2.00	5.37
	CA	3,501	3.27	2.00	4.04	3,852	4.24	2.00	5.49
Panel C: Ownership Data									
Ownership concentration	OC	39,804	0.6548	0.5713	0.2164	41,259	0.1991	0.2123	0.0737
	IO	37,502	0.5224	0.4313	0.2593	42,026	0.3096	0.2531	0.2307
	CA	25,259	0.3894	0.3349	0.2426	28,233	0.4232	0.3496	0.2710
Inside Ownership	OC	39,802	0.7454	0.8267	0.2663	41,256	0.5068	0.4539	0.2724
	IO	37,502	0.9560	1.0000	0.0643	42,024	0.3375	0.3495	0.1270
	CA	25,258	0.6169	0.6000	0.2914	28,231	0.6303	0.6428	0.2930
Panel D: CEO Data									
CEO age	OC	27,179	52.19	52.00	7.91	27,966	51.81	51.00	8.42
	IO	23,877	51.88	52.00	8.25	29,262	51.70	51.00	8.31
	CA	28,256	44.29	44.00	5.10	30,774	58.69	59.00	5.71

This table provides descriptive statistics on accounting data (Panel A), patent data (Panel B), ownership data (Panel C), and CEO data (Panel D), separately for firms in the highest two quintiles of our private benefits of control proxies (high-*B* firms) and firms in the lowest two quintiles of the private benefits of control proxies (low-*B* firms). The proxy OC denotes a firm's ownership concentration based on the Herfindahl index, IO denotes inside ownership, the fraction of a firm's share owned by the CEO and her family, and CA denotes the age of the CEO.

Table 3: Borrowing and Investment

Dep var:	I IR_{it}	II $DebtA_{it}$	III $InvA_{it}$	V $\Delta\ Profits_{it}$
Panel A: OC_i				
$B_i * event_t$	0.0007***	0.0033***	0.0023***	0.0012***
	[0.0002]	[0.0010]	[0.0006]	[0.0004]
Observations	80,232	88,183	87,936	88,510
R-squared	0.596	0.760	0.366	0.193
Panel B: IO_i				
$B_i * event_t$	0.0012***	0.0059***	0.0025***	0.0014***
	[0.0002]	[0.0011]	[0.0007]	[0.0004]
Observations	80,232	88,183	87,936	88,510
R-squared	0.596	0.761	0.366	0.193
Panel C: CA_i				
$B_i * event_t$	0.0006**	0.0041***	0.0050***	0.0010**
	[0.0003]	[0.0014]	[0.0008]	[0.0005]
Observations	60,037	65,912	65,735	66,137
R-squared	0.602	0.767	0.379	0.210
Firm FE	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind

This table shows the results from estimating equation (6) regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction of a variable (B_i) that takes the value of 1 for firms in the lowest quintile of private benefits of control to 5 for firms in the highest quintile of private benefits of control and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005 and 1 for the post-reform period from 2006-2010. In Panel A, private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, and ** denote statistical significance at the 1%, and 5% levels, respectively.

Table 4: Risk-Taking

Dep var:	I $RnDA_{it}$	II $RnDI_{it}$	III PaA_{it}	IV $Vola(CF)_{it}$
Panel A: OC_i				
$B_i * event_t$	0.0014*** [0.0003]	0.0613*** [0.0104]	0.0021*** [0.0006]	0.0243*** [0.0087]
Observations	13,086	12,703	88,520	22,664
R-squared	0.865	0.608	0.507	0.651
Panel B: IO_i				
$B_i * event_t$	0.0017*** [0.0004]	0.0746*** [0.0136]	0.0017** [0.0007]	0.0187*** [0.0065]
Observations	13,086	12,703	88,520	22,662
R-squared	0.865	0.608	0.507	0.650
Panel C: CA_i				
$B_i * event_t$	0.0015*** [0.0005]	0.0287** [0.0130]	0.0018** [0.0007]	0.0447*** [0.0083]
Observations	9,849	9,564	66,143	16,517
R-squared	0.875	0.621	0.509	0.660
Firm FE	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind

This table shows the results of estimation equation (6) regressing firms' R&D spending to asset ratio ($RnDA_{it}$), R&D spending to total investment ratio ($RnDI_{it}$), patents to assets ratio (PaA_{it}), and cash flow volatility ($Vola(CF)_{it}$) on the interaction of a variable (B_i) that takes the value of 1 for firms in the lowest quintile of private benefits of control to 5 for firms in the highest quintile of private benefits of control and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2010. In Panel A private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, and ** denote statistical significance at the 1%, and 5% levels, respectively.

Table 5: Heterogeneous Reform Effects

Dep var:	I IR_{it}	II IR_{it}	III $DebtA_{it}$	IV $DebtA_{it}$	V $InvA_{it}$	VI $InvA_{it}$	VII $\Delta\ Profits_{it}$	VIII $\Delta\ Profits_{it}$	IX $RnDA_{it}$	X $RnDA_{it}$
	High B	Low B	High B	Low B	High B	Low B	High B	Low B	High B	Low B
Panel A: OC_i										
$risk_i * event_t$	0.0041***	0.0033***	0.0106***	-0.0104***	0.0064***	-0.0044***	0.0025*	-0.0063***	0.0047***	0.0000
	[0.0006]	[0.0008]	[0.0028]	[0.0028]	[0.0018]	[0.0016]	[0.0015]	[0.0013]	[0.0012]	[0.0013]
$p-value$	0.406		0.000		0.000		0.000		0.006	
Observations	30,694	34,187	33,684	36,367	33,564	36,286	33,680	36,361	15,602	15,594
R-squared	0.654	0.603	0.787	0.765	0.421	0.419	0.378	0.369	0.816	0.837
Panel B: IO_i										
$risk_i * event_t$	0.0037***	0.0038***	0.0069**	-0.0055***	0.0047**	-0.0052***	0.0030*	-0.0060***	0.0063***	0.0000
	[0.0006]	[0.0007]	[0.0034]	[0.0025]	[0.0020]	[0.0015]	[0.0017]	[0.0015]	[0.0016]	[0.0009]
$p-value$	0.889		0.006		0.000		0.000		0.000	
Observations	27,848	34,598	30,169	37,303	30,051	37,229	30,164	37,299	13,053	16,542
R-squared	0.670	0.607	0.792	0.762	0.432	0.422	0.400	0.360	0.831	0.833
Panel C: CA_i										
$risk_i * event_t$	0.0045***	0.0024***	0.0137***	-0.0085***	0.0064***	-0.0037**	0.0045**	-0.0077***	0.0067***	0.0018**
	[0.0007]	[0.0007]	[0.0038]	[0.0030]	[0.0023]	[0.0018]	[0.0021]	[0.0012]	[0.0024]	[0.0009]
$p-value$	0.030		0.000		0.000		0.000		0.046	
Observations	21,805	25,920	23,417	27,704	23,340	27,644	23,413	27,701	11,326	12,193
R-squared	0.634	0.645	0.761	0.798	0.472	0.408	0.422	0.377	0.812	0.879
Firm FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind	ind	ind	ind	ind	ind	ind

This table shows the results of estimating equation (7) regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), growth rate of profits ($\Delta\ Profits_{it}$), and R&D spending to asset ratio ($RnDA_{it}$) on the interaction of a variable ($risk_i$) that takes the value of 1 for firms in the lowest quintile of bankruptcy risk to 5 for firms in the highest quintile of bankruptcy risk and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005 and 1 for the post-reform period from 2006-2010. In columns entitled High B the sample is limited to firms in the highest two quintiles of private benefits of control, in columns entitled Low B the sample is limited to firms in the lowest two quintiles of private benefits of control. The table reports p-values on the difference in the estimate for the high-B and low-B firm samples. In Panel A private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix A. Unified Bankruptcy Act

This section lists the additional changes in corporate reorganization law due to the UBA.

- While the UBA does not contain an automatic stay mechanism, the court may grant a comprehensive stay order restricting claim enforcement of secured and unsecured creditors. Under the CRA the debtor had to apply to the court for stay orders for each creditor separately.
- Under the CRA, all creditors were required to file their claims before a deadline set by the court for the claims to be considered. The new act automatically assumes that all claims have been filed if they appear on a list of creditors submitted by the receiver.
- Under the UBA, each creditor is guaranteed to receive at least the amount they would receive under liquidation unless the creditor agrees to a lower amount. The old law did not grant such a guarantee to creditors.
- Under the UBA, the establishment of a creditors' committee is mandatory. The creditors' committee coordinates the interest of the creditors and may demand specific information from the debtor and request an investigation of the propriety of management control during rehabilitation.
- Under the UBA, international bankruptcy proceedings may be recognized in Korea for the settlement of international cases, whereas under the old law only bankruptcy proceedings filed in Korea were recognized.

Appendix B. Proofs

Appendix B.1. Proof of Proposition 1

For $B < \bar{B}$, we have

$$\max\left\{\rho_r^{\mathrm{IC}}(B), \rho_r^{\mathrm{PC}}(B)\right\} < \max\left\{\rho_m^{\mathrm{IC}}(B), \rho_m^{\mathrm{PC}}(B)\right\},$$

such that the probability of investment is higher under the receivership system compared with the management stay system. For $B > \bar{B}$, we have

$$\max\left\{\rho_r^{\mathrm{IC}}(B), \rho_r^{\mathrm{PC}}(B)\right\} > \max\left\{\rho_m^{\mathrm{IC}}(B), \rho_m^{\mathrm{PC}}(B)\right\},$$

such that the probability of investment is lower under the receivership system compared with the management stay system. ■

Appendix B.2. Proof of Proposition 2

Keeping $p_H - p_L$ constant, the first-order condition of $\rho_j^{\mathrm{PC}}(B)$ with respect to p_H is given by

$$-\frac{1}{p_H^2}(I+c+(1-\mu_j)(V+B-D)) < 0.$$

Further, we have

$$\mathbb{P}\left(\rho_m^{\mathrm{PC}}(B) \leq R \leq \rho_r^{\mathrm{PC}}(B)\right) = \int_{\rho_m^{\mathrm{PC}}(B)}^{\rho_r^{\mathrm{PC}}(B)} f \,\mathrm{d}R = f\left(\rho_r^{\mathrm{PC}}(B) - \rho_m^{\mathrm{PC}}(B)\right).$$

The first-order condition with respect to p_H is given by

$$-f\frac{1}{p_H^2}(I+c+(1-\mu_r)(V+B-D)) + f\frac{1}{p_H^2}(I+c+(1-\mu_m)(V+B-D)),$$

which can be rewritten as

$$f\frac{1}{p_H^2}(V+B-D)(\mu_r-\mu_m),$$

which is negative, since $V+B-D>0$, $f>0$, and $\mu_m > \mu_r$. ■

Appendix C. Additional Tables

Table A.1: Management Stay in Bankruptcy

English Law		French Law		German Law	
Australia	1	Argentina	1	Austria	1
Canada	1	Belgium	1	Germany	1
Hong Kong	0	Brazil	1	Japan	0
India	0	Chile	1	South Korea	1
Ireland	1	Colombia	1	Switzerland	1
Israel	0	Ecuador	0	Taiwan	1
Kenya	0	Egypt	0	Scandinavian Law	
Malaysia	0	France	1	Denmark	1
New Zealand	0	Greece	0	Finland	1
Nigeria	0	Indonesia	0	Norway	1
Pakistan	0	Italy	1	Sweden	1
Singapore	0	Mexico	1		
South Africa	0	Netherlands	1		
Sri Lanka	0	Peru	1		
Thailand	0	Philippines	1		
UK	0	Portugal	1		
US	1	Spain	1		
Zimbabwe	0	Turkey	1		
		Uruguay	1		
		Venezuela	0		

This table reports information on management stay in different countries. Data are from La Porta et al. (1998) and updated for the introduction of management stay in Korea through the UBA. Other countries did not experience a change in management stay until 2005 (Djankov, McLiesh, and Shleifer 2007).

Table A.2: Borrowing and Investment - Excluding Financial Crisis Period

Dep var:	I IR_{it}	II $DebtA_{it}$	III $InvA_{it}$	IV $\Delta\ Profits_{it}$
Panel A: OC_i				
$B_i * event_t$	0.0007***	0.0039***	0.0029***	0.0013***
	[0.0002]	[0.0009]	[0.0006]	[0.0004]
Observations	63,657	69,889	69,683	70,122
R-squared	0.612	0.771	0.402	0.233
Panel B: IO_i				
$B_i * event_t$	0.0011***	0.0063***	0.0029***	0.0010**
	[0.0002]	[0.0010]	[0.0007]	[0.0005]
Observations	63,657	69,889	69,683	70,122
R-squared	0.612	0.771	0.402	0.233
Panel C: CA_i				
$B_i * event_t$	0.0006**	0.0042***	0.0052***	0.0007
	[0.0003]	[0.0013]	[0.0009]	[0.0007]
Observations	47,580	52,207	52,060	52,369
R-squared	0.621	0.776	0.413	0.249
Firm FE	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind

This table shows the results of estimation equation (6) regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction of a variable (B_i) that takes the value of 1 for firms in the lowest quintile of private benefits of control to 5 for firms in the highest quintile and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2007 and 2010, excluding the financial crisis. In Panel A, private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, and ** denote statistical significance at the 1%, and 5% levels, respectively.

Table A.3: Heterogeneous Reform Effect - Excluding Financial Crisis Period

Dep var:	I	II	III	IV	V	VI	VII	VIII
	IR_{it}		$DebtA_{it}$		$InvA_{it}$		$\Delta\ Profits_{it}$	
Dep var:	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$
Panel A: OC_i								
$B_i * event_t$	0.0036***	0.0028***	0.0116***	-0.0084***	0.0055***	-0.0073***	0.0038**	-0.0059***
	[0.0005]	[0.0007]	[0.0027]	[0.0028]	[0.0017]	[0.0017]	[0.0016]	[0.0015]
$p-value$	0.388		0.000		0.000		0.000	
Observations	24,337	27,181	26,664	28,919	26,567	28,848	26,660	28,913
R-squared	0.665	0.622	0.797	0.775	0.437	0.439	0.405	0.398
Panel B: IO_i								
$B_i * event_t$	0.0037***	0.0033***	0.0072**	-0.0046*	0.0045**	-0.0085***	0.0035**	-0.0064***
	[0.0006]	[0.0007]	[0.0033]	[0.0025]	[0.0018]	[0.0017]	[0.0015]	[0.0016]
$p-value$	0.967		0.007		0.000		0.000	
Observations	21,995	27,459	23,837	29,578	23,734	29,516	23,832	29,574
R-squared	0.684	0.626	0.802	0.772	0.456	0.456	0.434	0.390
Panel C: CA_i								
$B_i * event_t$	0.0033***	0.0019***	0.00161***	-0.0084***	0.0045*	-0.0076***	0.0037	-0.0074***
	[0.0008]	[0.0007]	[0.0038]	[0.0028]	[0.0025]	[0.0019]	[0.0023]	[0.0014]
$p-value$	0.214		0.000		0.000		0.000	
Observations	16,718	20,738	18,391	22,160	18,325	22,107	18,387	22,157
R-squared	0.653	0.662	0.768	0.811	0.509	0.433	0.460	0.405
Firm FE	yes	yes	yes	yes	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind	ind	ind	ind	ind

This table shows the results of estimating equation (7) regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction on the interaction of a variable ($risk_i$) that takes the value of 1 for firms in the lowest quintile of bankruptcy risk to 5 for firms in the highest quintile of bankruptcy risk and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2007 and 2010, excluding the financial crisis. In columns entitled High B the sample is limited to firms in the highest two quintiles of private benefits of control, in columns entitled Low B the sample is limited to firms in the lowest two quintiles of private benefits of control. The table reports p-values on the difference in the estimate for the high-B and low-B firms samples. In Panel A private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.4: Borrowing and Investment - Early Sorting

Dep var:	I IR_{it}	II $DebtA_{it}$	III $InvA_{it}$	IV $\Delta\ Profits_{it}$
Panel A: OC_i				
$B_i * event_t$	0.0007***	0.0033***	0.0023***	0.0013***
	[0.0002]	[0.0010]	[0.0006]	[0.0003]
Observations	76,938	84,061	83,807	84,193
R-squared	0.586	0.756	0.360	0.204
Panel B: IO_i				
$B_i * event_t$	0.0012***	0.0057***	0.0024***	0.0013***
	[0.0002]	[0.0011]	[0.0007]	[0.0004]
Observations	76,938	84,061	83,807	84,193
R-squared	0.586	0.756	0.360	0.204
Panel C: CA_i				
$B_i * event_t$	0.0005*	0.0044***	0.0047***	0.0012***
	[0.0003]	[0.0017]	[0.0008]	[0.0005]
Observations	58,033	63,296	63,119	63,404
R-squared	0.597	0.766	0.375	0.224
Firm FE	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind

This table shows the results of estimation equation (6) regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction of a variable (B_i) that takes the value of 1 for firms in the lowest quintile of private benefits of control to 5 for firms in the highest quintile and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2010. In Panel A, private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Firms are sorted based on these values in 2001. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, and ** denote statistical significance at the 1%, and 5% levels, respectively.

Table A.5: Heterogeneous Reform Effects - Early Sorting

Dep var:	I	II	III	IV	V	VI	VII	VIII
	IR_{it}		$DebtA_{it}$		$InvA_{it}$		$\Delta\ Profits_{it}$	
Dep var:	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$
Panel A: OC_i								
$B_i * event_t$	0.0040***	0.0040***	0.0086***	-0.0115***	0.0050***	-0.0040**	0.0027**	-0.0068***
	[0.0006]	[0.0008]	[0.0030]	[0.0028]	[0.0017]	[0.0018]	[0.0013]	[0.0014]
$p-value$	0.957		0.000		0.000		0.000	
Observations	30,104	30,785	32,902	32,728	32,767	32,655	32,894	32,722
R-squared	0.645	0.605	0.784	0.768	0.413	0.425	0.370	0.390
Panel B: IO_i								
$B_i * event_t$	0.0038***	0.0042***	0.0079**	-0.0066*****	0.0038*	-0.0049***	0.0039***	-0.0063***
	[0.0006]	[0.0008]	[0.0032]	[0.0026]	[0.0021]	[0.0014]	[0.0015]	[0.0015]
$p-value$	0.696		0.001		0.000		0.000	
Observations	28,948	31,111	31,125	33,572	30,997	33,499	31,116	33,568
R-squared	0.637	0.615	0.780	0.769	0.421	0.430	0.385	0.380
Panel C: CA_i								
$B_i * event_t$	0.0047***	0.0019***	0.0147***	-0.0056*	0.0067***	-0.0032*	0.0036*	-0.0064***
	[0.0008]	[0.0007]	[0.0040]	[0.0030]	[0.0022]	[0.0020]	[0.0019]	[0.0012]
$p-value$	0.004		0.000		0.001		0.000	
Observations	19,911	24,124	21,287	25,841	21,213	25,785	21,282	25,836
R-squared	0.631	0.665	0.758	0.809	0.468	0.419	0.436	0.398
Firm FE	yes	yes	yes	yes	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind	ind	ind	ind	ind

This table shows the results of estimating equation (7) regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction on the interaction of a variable ($risk_i$) that takes the value of 1 for firms in the lowest quintile of bankruptcy risk to 5 for firms in the highest quintile of bankruptcy risk and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2010. In columns entitled High *B* the sample is limited to firms in the highest two quintiles of private benefits of control, in columns entitled Low *B* the sample is limited to firms in the lowest two quintiles of private benefits of control. The table reports *p*-values on the difference in the estimate for the high-*B* and low-*B* firms samples. In Panel A private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Firms are sorted based on these values in 2001. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.6: Borrowing and Investment - Excluding Business Groups

Dep var:	I IR_{it}	II $DebtA_{it}$	III $InvA_{it}$	IV $\Delta\ Profits_{it}$
Panel A: OC_i				
$B_i * event_t$	0.0012***	0.0047***	0.0031***	0.0011***
	[0.0002]	[0.0011]	[0.0007]	[0.0004]
Observations	66,509	72,184	71,974	72,456
R-squared	0.600	0.758	0.375	0.203
Panel B: IO_i				
$B_i * event_t$	0.0011***	0.0051***	0.0017**	0.0012***
	[0.0003]	[0.0012]	[0.0008]	[0.0005]
Observations	66,509	72,184	71,974	72,456
R-squared	0.600	0.758	0.375	0.203
Panel C: CA_i				
$B_i * event_t$	0.0002	0.0036**	0.0045***	0.0009*
	[0.0004]	[0.0017]	[0.0010]	[0.0006]
Observations	44,452	48,112	47,993	48,269
R-squared	0.607	0.759	0.390	0.225
Firm FE	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes
Controls	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind

This table shows the results of estimation equation (6) excluding firms that are part of business groups, regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction of a variable (B_i) that takes the value of 1 for firms in the lowest quintile of private benefits of control to 5 for firms in the highest quintile and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2010. In Panel A, private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, and ** denote statistical significance at the 1%, and 5% levels, respectively.

Table A.7: Heterogeneous Reform Effect - Excluding Business Groups

Dep var:	I	II	III	IV	V	VI	VII	VIII
	IR_{it}		$DebtA_{it}$		$InvA_{it}$		$\Delta\ Profits_{it}$	
Dep var:	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$	$High\ B_i$	$Low\ B_i$
Panel A: OC_i								
$B_i * event_t$	0.0046***	0.0027***	0.0140***	-0.0081**	0.0072***	-0.0044**	0.0039**	-0.0057***
	[0.0007]	[0.0008]	[0.0032]	[0.0032]	[0.0022]	[0.0020]	[0.0018]	[0.0015]
$p-value$	0.078		0.000		0.000		0.000	
Observations	25,208	27,495	27,163	29,106	27,064	29,033	27,160	29,100
R-squared	0.662	0.614	0.790	0.766	0.433	0.439	0.400	0.395
Panel B: IO_i								
$B_i * event_t$	0.0037***	0.0033***	0.0068*	-0.0017	0.0042**	-0.0066***	0.0034**	-0.0052***
	[0.0006]	[0.0008]	[0.0036]	[0.0036]	[0.0021]	[0.0022]	[0.0017]	[0.0017]
$p-value$	0.676		0.121		0.000		0.000	
Observations	27,241	23,649	29,467	25,039	29,352	24,988	29,463	25,036
R-squared	0.672	0.612	0.791	0.763	0.434	0.450	0.403	0.400
Panel C: CA_i								
$B_i * event_t$	0.0033***	0.0037***	0.00120**	-0.0100***	0.0068**	-0.0039*	0.0054**	-0.0071***
	[0.0009]	[0.0009]	[0.0054]	[0.0038]	[0.0029]	[0.0025]	[0.0026]	[0.0013]
$p-value$	0.715		0.001		0.004		0.000	
Observations	16,718	18,778	17,761	19,840	17,709	19,802	17,758	19,838
R-squared	0.644	0.658	0.761	0.792	0.488	0.438	0.441	0.420
Firm FE	yes	yes	yes	yes	yes	yes	yes	yes
Ind-Year FE	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Clustered SE	ind	ind	ind	ind	ind	ind	ind	ind

This table shows the results of estimating equation (7) excluding firms that are part of business groups, regressing firms' interest rates (IR_{it}), debt to asset ratio ($DebtA_{it}$), investment to assets ratio ($InvA_{it}$), and growth rate of profits ($\Delta\ Profits_{it}$) on the interaction on the interaction of a variable ($risk_i$) that takes the value of 1 for firms in the lowest quintile of bankruptcy risk to 5 for firms in the highest quintile of bankruptcy risk and a dummy variable ($event_t$) that takes the value of 0 for the pre-reform period from 2001-2005, and 1 for the post-reform period from 2006-2010. In columns entitled High *B* the sample is limited to firms in the highest two quintiles of private benefits of control, in columns entitled Low *B* the sample is limited to firms in the lowest two quintiles of private benefits of control. The table reports *p*-values on the difference in the estimate for the high-*B* and low-*B* firms samples. In Panel A private benefits of control are computed as the Herfindahl index of a firm's ownership, in Panel B as the fraction of shares owned by the firm's CEO and her family, in Panel C based on the age of the CEO. Standard errors are reported in brackets. The bottom section provides information on fixed effects and the clustering of standard errors. Details on control variables can be found in the text. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

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