Dual-Class Firms, Agency Problems, and Debt Governance: Evidence from Korea*

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Abstract

I examine whether debt (or, more generally, a performance threshold) can reduce agency problems between controlling shareholders and minority shareholders in dual-class firms. To do so, I use two key features of debt governance. First, it is only effective with bankruptcy penalties, second, it only matters for firms close to default. I measure agency problems by the voting premium. Using a Korean bankruptcy reform that reduced penalties, I find that risky firms exhibited a 59% increase in the voting premium after the reform relative to safe firms. My findings have important implications for the heated debate on dual-class share structure.

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Keywords: dual-class, debt, corporate governance, bankruptcy, voting premium.

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1. Introduction

Dual-class firms have become increasingly important in recent years. For example, in the US, the average share of dual-class IPOs in all IPOs was 25% in 2017–2021 (see Figure 1). Prominent examples of dual-class firms around the world are Google and Facebook in the US, Samsung and Hyundai in Korea, BMW and Volkswagen in Germany, or Volvo and Hennes & Mauritz in Sweden. As a reaction to the increasing popularity, dual-class shares have become the subject of an extensive debate in academia and politics. Dual-class share structure can be costly because the separation of control and ownership creates potentially extreme agency problems between controlling shareholders and minority shareholders. Yet, dual-class share structure can also be beneficial because it allows insiders flexibility towards less-informed or short-termed outside shareholders. Among researchers and regulators, the central question in this context is how to allow dual-class firms, while at the same time offering solutions to effectively limit possible expropriation of minority shareholders by controlling shareholders. Note that finding solutions is difficult, given that the high degree of control makes controlling shareholders typically immune to traditional governance mechanisms, such as shareholder activism, incentive compensation, or board independence.[1]

In this paper, I study whether a performance threshold can mitigate agency problems. In particular, I examine whether debt can reduce agency problems between controlling shareholders and minority shareholders in dual-class firms. A large body of theoretical research gives debt a central role in corporate governance. Specifically, it is argued that debt gives creditors control and liquidation rights when the firm fails to make a prespecified payment. This threat of a loss in private control benefits motivates controlling shareholders to reduce the probability of bankruptcy by pursuing high profits rather than less profitable personal objectives. As such, debt can serve minority shareholders as a disciplinary source to limit adverse managerial actions, and can further serve

[1] For the debate in academia and politics on dual-class firms, see Bebchuk and Kastiel (2017), Berger and Hodrick (2018), Govindarajan et al. (2018), Sharfman (2018, 2019), Fisch and Solomon (2019), Fleming (2019), Kim and Michaely (2019), Papadopoulos (2019), Aggarwal et al. (2021), Lel et al. (2021), and Cremers, Lauterbach, and Pajuste (2022). For empirical evidence on the costs and benefits of dual-class share structure, see, e.g., Gompers, Ishii, and Metrick (2010), Kim and Michaely (2019), Lel et al. (2021), and Cremers, Lauterbach, and Pajuste (2022). For the limitations of other governance mechanisms to mitigate agency problems between controlling shareholders and minority shareholders, see Masulis, Wang, and Xie (2009), Dey, Nikolaev, and Wang (2016), Bebchuk and Hamdani (2017), Bebchuk and Kastiel (2017), and Aggarwal et al. (2021).

controlling shareholders as a bonding device to commit to a sufficient level of efficiency in order to secure financing.[2]

To provide empirical evidence, I use two key features of debt as a governance device (Canipek, 2023). First, debt governance is only effective with bankruptcy penalties, given that the absence of penalties undermines controlling shareholders' incentive to avoid bankruptcy (Grossman and Hart, 1982; Aghion, Hart, and Moore, 1992; Hart, 1995, 2000). Second, debt governance only matters for firms close to bankruptcy, given that proximity to default ensures bankruptcy when performance is poor (Zwiebel, 1996; Hart, 2001). Based on these two features, the central test of my paper is whether firms with high default probability exhibit an increase in agency costs relative to firms with low default probability when a bankruptcy law that is soft on controlling shareholders makes debt governance ineffective.

As a change in penalties, I use Korea's bankruptcy reform of 2006 which replaced a creditor-friendly law with a debtor-friendly law. The reform significantly reduced controlling shareholders' cost of bankruptcy, thereby changing debt governance from effective to ineffective. In particular, before the reform, the incumbent management was dismissed during the bankruptcy proceeding and ownership of the firm was transferred to new owners. In contrast, after the reform, the incumbent management remains in corporate control during bankruptcy and ownership is retained by the existing owners (Ko, 2007; Schoenherr and Starmans, 2022).

Measuring changes in agency problems is difficult, and perhaps even more difficult in the context of debt governance. Typically, changes in agency problems are inferred by changes in the firm value, given that potential agency problems should be reflected in the valuation of the company (e.g., Gompers, Ishii, and Metrick, 2003; Harvey, Lins, and Roper, 2004). However, in the setting of debt governance this approach is not very meaningful. The reason is that bankruptcy law not only affects the effectivity of debt governance, but may also affect credit costs and distress costs.[3] As a result, possible changes in the firm value might not be because of a change in debt governance, but because of changes in the other two variables.

[2] On the role of debt in restricting diversion of funds, see, e.g., Grossman and Hart (1982); in inducing effort, see, e.g., Dewatripont and Tirole (1994); and in curbing empire building, see, e.g., Zwiebel (1996). For surveys and studies providing discussions on debt as a disciplinary and bonding mechanism, see Aghion, Hart, and Moore (1992), Hart (1995, 2000, 2001, 2017), Benmelech and Bergman (2008), and Canipek (2023).

[3] As suggested by the bankruptcy literature (Acharya, Amihud, and Litov, 2011; Vig, 2013; Mann, 2018; Canipek, Kind, and Wende, 2021; Schoenherr and Starmans, 2022), stronger creditor rights can reduce credit costs through higher collateral value and thus may increase firm value by allowing firms to increase financing and

I measure private benefits of control by the price difference of high- and low-voting shares in dual-class firms. The idea here is that if control is valuable, this should be reflected in the price of votes. Because minority shareholders do not have access to private benefits of control, the voting premium reflects the expected price a large shareholder is willing to pay when accumulating shares to form a controlling coalition (Zingales, 1994, 1995; Chung and Kim, 1999; Nenova, 2003; Doidge, 2004; Guadalupe and Pérez-González, 2010; Hong, 2013). Note that the voting premium not only depends on the size of private control benefits, but also on the probability of a control contest (Zingales, 1994, 1995; Chung and Kim, 1999; Nenova, 2003). As a result, changes in the voting premium in response to changes in agency problems should be concentrated among firms for which a control contest is more possible, which is typically the case when ownership is dispersed. I will use this feature to examine cross-sectional variation in possible changes of the voting premium. Finally, note how looking at shares with dissimilar voting rights but similar cash flow rights gets around the measurement problem of agency costs. While the potential effect of changes in credit costs and distress costs affects high- and low-voting shares similarly by the cash flow component, the potential effect of changes in debt governance affects both share classes differently (presumably, a lower effectivity of debt governance is beneficial for the voting share, but costly for the nonvoting share).

Consistent with the hypothesis that debt reduces agency problems, I find that firms with high probability of default exhibited an increase in the voting premium after the reform relative to firms with low probability of default. The economic effect is sizable. Relative to firms with low default probability, the voting premium of firms with high default probability increased by 59% after the reform, suggesting that debt is valued as a powerful mechanism for solving agency problems. Importantly, given that prices are forward-looking, the results also suggest that firms cannot fully substitute debt governance with other governance mechanisms, consistent with the notion that debt may be special in solving the agency problems in dual-class firms. This is further confirmed by the fact that the increase in the voting premium persists for several years after the reform was introduced.

An analysis across firms with high default probability further supports my findings. In particular, I find that the increase in the voting premium is stronger for those high default probability

investments. In contrast, stronger creditor rights can also increase distress costs and thus may reduce firm value by prompting firms to lower leverage and undertake risk-reducing but unprofitable investments.

firms in which ownership is more dispersed (when the possibility of a control contest is higher) and in which potential agency problems are extreme (specifically, when firm age and firm size is higher). In fact, while risky firms with concentrated ownership and low agency problems still experienced an increase in the voting premium, for risky firms with dispersed ownership and high agency problems the increase is more than one third larger. Notably, the effect varies especially across firm age, consistent with a raising view in the dual-class literature that the potential benefits of dual-class share structure tend to decrease while the potential costs tend to increase as time passes (Bebchuk and Kastiel, 2017; Kim and Michaely, 2019; Cremers, Lauterbach, and Pajuste, 2022).

A potential concern with my results is that a confounding factor affected the voting premium of high and low default probability firms differently. Various pieces of evidence mitigate this concern. First, I find that the voting premium of high and low default probability firms followed parallel trends several years prior to the reform, suggesting that the voting premium of both groups of firms would have followed the same trend in the absence of the reform. Second, the heterogeneities discussed above suggest that a confounding factor must not only have had a different effect on firms with high and low default probability, but also on firms with different levels of ownership concentration and agency problems. Third, one specific confounding factor might be the 2007–2009 financial crisis. I find that the documented changes occurred shortly after the enactment of the law in 2005, and not in 2008 when the financial crisis began to affect the Korean economy (Schoenherr and Starmans, 2022). Fourth, I find that in other countries firms with high default probability did not exhibit an increase in the voting premium relative to firms with low default probability after the reform in Korea, suggesting that the observed changes in Korea are not driven by confounding shocks that were common to all countries. Finally, I find that agency problems are negatively related to bankruptcy penalties also across countries, further confirming the results from Korea.

My paper contributes to the financial contracting literature. In particular, I provide empirical evidence on a central hypothesis of this literature, namely, that debt can mitigate agency problems. Despite the large volume of financial contracting theories and the importance of this hypothesis, there is little evidence on the empirical relevance of debt governance. Most closely related evidence comes from the concurrent work by Canipek (2023), who finds that firms appoint independent directors as a substitute when bankruptcy legislations that are soft on management make debt

governance ineffective, consistent with the notion that debt induces discipline. My paper is complementary to this study in several ways. First, I do not consider the relation between debt governance and board independence, but between debt governance and agency problems. This provides an alternative way to identify the governance role of debt, thereby offering additional evidence on an important subject for which little evidence exists. Second, my analysis does not include the agency problem between management and minority shareholders, but focuses on a specific agency problem, namely, the conflict between controlling shareholders and minority shareholders. This allows me to provide evidence on the usefulness of debt to mitigate an agency problem that is commonly viewed as being immune to traditional governance mechanisms (Masulis, Wang, and Xie, 2009; Dey, Nikolaev, and Wang, 2016; Bebchuk and Hamdani, 2017; Bebchuk and Kastiel, 2017; Aggarwal et al., 2021). Finally, by studying changes in agency problems, my analysis not only provides evidence on the hypothesis that debt can solve agency problems, but also on the hypothesis that, in certain situations, debt governance is not perfectly substitutable by other governance mechanisms. This evidence is important as it has key implications on bankruptcy design.[4]

My study also contributes to the literature on optimal bankruptcy design. In particular, my findings provide empirical evidence consistent with the view that bankruptcy law should preserve the governance role of debt by adequately penalizing management and controlling shareholders in bankruptcy states. In the absence of bankruptcy penalties, firms may have difficulties to credibly commit to refrain from inefficient actions and thus to secure financing ex ante (Aghion, Hart, and Moore, 1992; Hart, 2000). It is important to note that this aspect is not considered by the current bankruptcy literature.[5] Moreover, while my findings are important in general, they may be of

[4] More broadly related evidence comes from studies that find a negative relation between managerial entrenchment and debt and suggest that this is consistent with entrenched managers avoiding the disciplinary role of debt (Berger, Ofek, and Yermack, 1997; Garvey and Hanka, 1999), or from studies that find a positive relation between debt and market value and suggest that this is consistent with debt is valued as a governance device (e.g., Harvey, Lins, and Roper, 2004; Dey, Nikolaev, and Wang, 2016). However, these papers examine the governance role of debt in general, i.e., the incentive effect of debt that comes, besides the threat of bankruptcy penalties, also through other mechanisms, such as forcing management to disgorge free cash flow (e.g., Jensen, 1986), additional monitoring by lenders (Harvey, Lins, and Roper, 2004), or the threat of managerial restrictions following covenant violation (e.g., Nini, Smith, and Sufi, 2012). Moreover, given their reliance on cross-sectional or event-study analysis, a restriction of these studies is the potential endogeneities in the relations between debt and the other variables, making it difficult to draw reliable inferences. Different than these studies, I exploit two key features of debt as a governance device that allow me to provide direct and credible evidence on the incentive effect of bankruptcy penalties. On the broadly related evidence, see also Canipek (2023).

[5] Currently, the bankruptcy literature focuses on two channels when asking whether stronger creditor rights facilitate or hamper firm financing (Acharya, Amihud, and Litov, 2011; Vig, 2013; Mann, 2018; Canipek, Kind, and Wende, 2021; Schoenherr and Starmans, 2022). The first channel is that stronger creditor rights may allow firms to increase debt financing by lowering credit costs through higher collateral value. In contrast, the second channel is that

particular importance in the context of the recent crises during which many countries have significantly softened their bankruptcy law.[6]

Finally, and most important, my paper contributes to the heated debate on dual-class share structure. Among academics and policymakers, perhaps the core question in this context is how to allow dual-class firms, while at the same time offering solutions to alleviate potential expropriation of minority shareholders by controlling shareholders. I contribute to this debate by providing empirical evidence that debt governance, or, more broadly, a mechanism that takes away control when a prespecified performance threshold cannot be achieved, can serve as a solution to effectively mitigate agency problems in dual-class firms. For regulators, my findings suggest that implementing provisions that allow for such mechanisms may be desirable. This can be done by providing a bankruptcy law for dual-class firms that sufficiently penalizes the controlling shareholder in the event of default. An alternative possibility, that may also provide an effective solution for safe firms, is to include "control change provisions" that allow controlling shareholders to maintain control when performance is good but transfer control when performance is bad. Kaplan and Strömberg (2003) analyze contracts between venture capitalists and entrepreneurs and show that, for solving agency problems, venture capitalists write contracts that are consistent with such a provision, i.e., they implement shifts in control that are contingent on observable measures of financial performance.[7][8] In the context of dual-class shares, the provision should be relatively easy

stronger creditor rights may prompt firms to reduce debt financing by increasing distress costs. As described above, my findings point to another channel through which stronger creditor rights can affect financing, namely, by increasing the effectivity of debt governance, which may reduce capital costs of equity (by reducing managerial expropriation) as well as debt (by lowering default probability) and thus may allow firms to obtain financing. Note that this channel is not necessarily incompatible with a debtor-friendly law. One way to combine the channels is by making bankruptcy penalties contingent on managerial misconduct (e.g., determined by the performance of comparable firms). Consistent with this, for some cases, the new debtor-friendly law in Korea stipulates that the incumbent management may not be allowed to remain in control during bankruptcy if insolvency was caused by material mismanagement (Park, 2008). As noted below, this rule does not affect my empirical analysis, given that my sample consists of listed firms for which the rule does not apply.

[6] To rescue distressed firms from liquidation, for example, Germany and the UK have softened their laws respectively as a response to the 2007–2009 financial crisis and the Covid-19 crisis (Canipek, Kind, and Wende, 2021; Payne, 2021). While in some situations suspending bankruptcy penalties temporarily may be desirable, my findings suggest that repealing them permanently may cause substantial costs.

[7] Note that such control change provisions follow the spirit of financial contracting and control change theories (e.g., Aghion and Bolton, 1992; Hart, 2001, 2017). Whereas debt contracts allow to shift control when collective action problems make control change provisions difficult to implement, such as in mature single-class firms, control change provisions can shift control when they are easier to implement, such as in the relation between venture capitalists and entrepreneurs or in the setting of dual-class firms (see below).

[8] Note that the relationship between minority shareholders and controlling shareholders is comparable to the relationship between venture capitalists and entrepreneurs. While minority shareholders can be seen as venture

to design. As the control shift, one could use the change of the dual-class share structure into a single-class share structure (or as a softer option, the approval by minority shareholders to maintain control) (as in sunset provisions; Bebchuk and Kastiel, 2017). As the performance threshold, one could use the performance of comparable single-class firms (perhaps complemented by a prespecified tolerance range).[9]

The rest of the paper is organized as follows. Section 2 provides information on dual-class firms, debt governance, and the Korean bankruptcy reform. Section 3 discusses the voting premium as a measure for private control benefits. Section 4 describes the data, provides summary statistics, and discusses the empirical method. Sections 5 and 6 present the empirical findings. Section 7 concludes.

2. Dual-class firms, debt governance, and Korea's bankruptcy reform

2.1. Dual-class firms

Dual-class firms are widespread worldwide and moreover have become increasingly important in recent years. In 2016, the share of dual-class firms in listed firms was about 4% worldwide, while dual-class firms accounted for about 10% of the worldwide market capitalization (Kim, Matos, and Xu, 2018). Some examples of dual-class firms around the world are Google and Facebook in the US, Samsung and Hyundai in Korea, BMW and Volkswagen in Germany, or Volvo and Hennes & Mauritz in Sweden.[10] Figure 1 shows that, in the US, the share of dual-class IPOs in all IPOs increased from 10% in 2003–2007 to 25% in 2017–2021 (Panel A), while dual-

capitalists that typically want to maximize firm value and mitigate agency problems, controlling shareholders can be seen as entrepreneurs who enter capital markets to finance their projects (Kaplan and Strömberg, 2003).

[9] Bebchuk and Kastiel (2017) offer another solution to the dual-class problem. Specifically, the authors argue that the potential benefits of dual-class shares tend to decrease and the potential costs tend to increase over time; and propose sunset provisions that, after a predetermined period of time, require companies to convert the dual-class structure into a single-class structure unless their extension is approved by minority shareholders. Consistent with this, Kim and Michaely (2019) and Cremers, Lauterbach, and Pajuste (2022) find that, at the time of the IPO, dual-class firms have higher valuation than single-class firms, while, over time, this valuation premium tends to disappear. Such sunset provisions are increasingly common in the US (51% of dual-class IPOs had sunset provisions in 2021, see https://www.cii.org/dualclass_stock) and are even under discussion in some countries to become mandatory. Note that sunset provisions are not without controversy, in particular, because the mandated conversion eliminates the possibility to maintain dual-class structure and thus the potential benefits associated with it (Berger and Hodrick, 2018; Sharfman, 2018, 2019; Berger, 2019; Fisch and Solomon, 2019).

[10] Other examples are Nike, Alibaba, The New York Times, Berkshire Hathaway, Viacom/CBS, LG, Nokia, Korean Air Lines, Snap, Levi Strauss & Co., Pinterest, Lyft, Ericsson, LinkedIn, Hershey's, Ralph Lauren, Ford, Under Armour, Dropbox, or Zoom.

class firms accounted for about 37% of the total IPO market capitalization in 2017–2020 (Panel B).

As a response to the increasing importance, dual-class firms have become the subject of an intense debate in the literature and politics. On the one hand, dual-class share structure can be value-reducing as the separation of ownership and control generates potentially large agency problems between controlling shareholders and minority shareholders. However, on the other hand, dual-class share structure can also be value-enhancing because it gives controlling shareholders freedom from less-informed or short-termed minority shareholders. Under scholars and regulators, the central question in this context is how to allow dual-class firms, while at the same time providing mechanisms to effectively limit possible expropriation of minority shareholders by controlling shareholders.[11] Finding mechanisms is notoriously difficult, given that traditional governance mechanisms, such as shareholder activism, incentive compensation, outside block-holders, the market of corporate control, corporate charter, or board independence, typically do not apply for controlling shareholders due to their high degree of control (Masulis, Wang, and Xie, 2009; Dey, Nikolaev, and Wang, 2016; Bebchuk and Hamdani, 2017; Bebchuk and Kastiel, 2017; Aggarwal et al., 2021).

2.2. Debt governance

In this study, I examine whether debt can mitigate agency problems between controlling shareholders and minority shareholders in dual-class firms. A large theoretical literature gives debt a fundamental role in corporate governance. In particular, it is argued that debt provides control and liquidation rights to creditors when the company is unable to make a previously agreed payment. This potential loss in control and ownership encourages the controlling shareholders to reduce the probability of bankruptcy by pursuing high profits rather than less profitable personal goals, such as diverting funds, empire building, or shirking. Hence, debt can be a disciplinary source that allows minority shareholders to restrict adverse managerial actions, and can moreover be a bonding device that allows controlling shareholders to commit to a sufficient level of efficiency in order to

[11] For the debate in research and politics about dual-class firms, see Bebchuk and Kastiel (2017), Berger and Hodrick (2018), Govindarajan et al. (2018), Sharfman (2018, 2019), Fisch and Solomon (2019), Fleming (2019), Kim and Michaely (2019), Papadopoulos (2019), Aggarwal et al. (2021), Lel et al. (2021), and Cremers, Lauterbach, and Pajuste (2022). For empirical evidence that dual-class share structure can be beneficial in some cases but costly in other cases, see, e.g, Gompers, Ishii, and Metrick (2010), Kim and Michaely (2019), Lel et al. (2021), and Cremers, Lauterbach, and Pajuste (2022).

ensure corporate financing (e.g., Grossman and Hart, 1982; Aghion, Hart, and Moore, 1992; Dewatripont and Tirole, 1994; Hart, 1995, 2000, 2001, 2017; Zwiebel, 1996; Benmelech and Bergman, 2008; Canipek, 2023).[12] Note that bankruptcy presents a specific performance threshold that may induce discipline. In the Conclusions, I will discuss the possibility of alternative thresholds that might also be applicable for dual-class firms.

To provide evidence, I follow Canipek (2023) and exploit two core features of debt as a governance device. The first feature is that debt governance is only effective with bankruptcy penalties, given that the absence of penalties undermines the incentive of controlling shareholders to avoid bankruptcy, and, hence, reduces the incentive effect of debt to pursue high profits (Grossman and Hart, 1982; Aghion, Hart, and Moore, 1992; Hart, 1995, 2000). The second feature is that debt governance only matters for firms close to bankruptcy, given that proximity to default ensures bankruptcy when performance is low, and, therefore, increases the incentive to be efficient in order to avoid bankruptcy (Zwiebel, 1996; Hart, 2001).[13] Building on these two features, the central test of my study is whether firms with high default probability experience an increase in agency problems relative to firms with low default probability when a bankruptcy reform that abolishes penalties makes debt governance ineffective. Importantly, comparing changes in agency problems of firms with high default probability to those of firms with low default probability has the advantage that it controls for factors, common to all firms, that might have changed together with a change in bankruptcy law.

[12] Note that bankruptcy may not only present the lower point of managerial inefficiency, but may also affect debtors earlier by determining the effectivity of other, typically, more upstream mechanisms through which debt can perform an incentive effect, such as forcing management to disgorge free cash flow (Jensen, 1986; Stulz, 1990; Hart and Moore, 1995) or the threat of managerial restrictions following covenant violation (e.g., Nini, Smith, and Sufi, 2012). For example, Hart and Moore (1995) argue that it is "hard" debt that curbs overinvestment by its nonpostponable nature such that debt is effectively enforced when due. Similarly, among others, Hart and Moore (1998) and Benmelech and Bergman (2008) suggest that, by determining bargaining power between creditors and debtors, bankruptcy law may be the starting point in the renegotiation process following a covenant violation. Whereas creditor-friendly bankruptcy procedures give creditors a credible threat to put the firm into bankruptcy (by high liquidation values for creditors and high bankruptcy costs for controlling shareholders) when denying the demanded amendments, debtor-friendly procedures improve firms' bargaining position (in fact, firms may default strategically, which typically allows to shake off debt and lowers creditors' liquidation value) and thus may reduce the extent of new restrictions that creditors can renegotiate.

[13] Notably, proximity to default increases the likelihood of bankruptcy in case of low performance not only because it increases the likelihood that profits are lower than debt dues, but also because for firms with high default probability such situations lead to actual default states, that is, firms cannot pay off current debt dues by issuing more debt in order to avert default (Hart and Moore, 1995; Zwiebel, 1996; Hart, 2001).

2.3. Korea's bankruptcy reform

2.3.1. Changes to bankruptcy law

As a change in penalties, I use Korea's bankruptcy reform of 2006 (the Unified Bankruptcy Act) that replaced a creditor-friendly law with a debtor-friendly law. The reform significantly reduced bankruptcy penalties for controlling shareholders, thereby changing debt governance from effective to ineffective. Specifically, under the old law, the incumbent management (which is typically the controlling shareholders or their representatives) was dismissed during the bankruptcy procedure. Moreover, corporate control was transferred to a court-appointed receiver who had the standard practice to engage in a sales process that typically led to an ownership transfer to new investors. In contrast, under the new law, the incumbent management stays in corporate control during bankruptcy and negotiates firm restructuring with the creditors (Ko, 2007; Schoenherr and Starmans, 2022).[14][15]

Empirically, Schoenherr and Starmans (2022) show that, under the pre-reform law, management remained in corporate control during bankruptcy in 5% of the bankruptcy cases and ownership transfer occurred in 91% of cases that do not result in liquidation. In contrast, under the post-reform law, management remains in control in 88% of cases and ownership transfer occurs in 19% of reorganization cases.[16]

2.3.2. History of the reform

The reformation process was prompted by the 1997–1998 Asian financial crisis. To receive financial support, in 1998, the Korean government agreed to the IMF and World Bank to

[14] The law does not provide an automatic stay of assets. However, the court can issue a comprehensive stay order that prohibits all creditors from seizing debtor's assets. Before the reform, a stay order was not comprehensive and was issued on a case by case basis separately for individual creditors (Ko, 2007; Park, 2008).

[15] Note that the incumbent management may not be allowed to remain control during bankruptcy if insolvency was caused by material mismanagement, creditors make a request for a reasonable cause, or it appears necessary for firm restructuring to appoint a third party receiver (Park, 2008). However, in practice, management maintained control in most situations (Park, 2008; Schoenherr and Starmans, 2022). Moreover, the exceptions noted above do not apply for many cases, most importantly for my study, when the company is listed on the stock exchange or registered on KOSDAQ (Park, 2008). Given that my study is based on firms listed on KOSDAQ, management of my sample firms stays in control by law.

[16] Larger or listed firms in general were not bailed-out by the government in case of bankruptcy. See, e.g., Nam and Oh (2000), Kim (2006), Halliday and Carruthers (2007), and Lee (2011), who discuss bankruptcy cases of large Korean chaebols and suggest that management and controlling shareholders were dismissed and lost corporate ownership. Also note that the bankruptcy data by Schoenherr and Starmans (2022) are based on a sample of large firms. In fact, the Korean public rather had little tolerance to rescue large firms in bankruptcy, which is also reflected in the fact that, before the reform, small firms typically had the opportunity to recover under a debtor-friendly law, while large firms were typically subject to a creditor-friendly law (Halliday and Carruthers, 2009).

modernize the bankruptcy law according to global norms. In particular, the IMF and World Bank demanded the unification of the existing system of three separate bankruptcy laws (a creditor-friendly law for large firms, a debtor-friendly law for small firms, and a private law) into a single statue, which was considered to be a more efficient and predictable solution to bankruptcy (Halliday and Carruthers, 2009; Schoenherr and Starmans, 2022).[17]

The reform process was hallmarked by different opinions on the actual usefulness of a reform, as well as conflicting opinions between various participants about the actual design of the reform (particularly, whether the law should be debtor- or creditor-friendly), leading to a back and forth between alternative sites of the reform through 1998 to 2005 (Halliday and Carruthers, 2009).[18][19] From 1998 to 2001, the government sought opinions from the various interest groups. From 2001 to 2003, a Ministry of Justice drafting team worked on various drafts, which were sent out to the participants for review and comments. In 2003, the Ministry of Justice submitted a unified law to the National Assembly. "With the change of government in March 2004, and in response to many critical comments from the Judiciary Committee, the draft was further revised and introduced again in 2004. After navigating its way through subcommittees of the National Assembly, amid some considerable controversy over several provisions, the unified law was enacted by the National Assembly in March 2005 to become effective twelve months later." (Halliday and Carruthers, 2009, p. 235).[20]

[17] Note that, given that my sample consists of large listed firms, the relevant pre-reform bankruptcy law in Korea for my analysis is the creditor-friendly law for large firms described in Section 2.3.1 above. Schoenherr and Starmans (2022) show that the debtor-friendly law for small firms applied primarily for firms with assets below 7 billion KRW (about 6 million USD). For comparison, the average asset size in my sample is 7.074 billion KRW (about 6 billion USD).

[18] Although the Korean government agreed to the IMF and World Bank to adjust its bankruptcy law with regard to the international norm of a uniform law, much disagreement existed over the actual usefulness of a reform, given that the existing system was seen by many as a suitable solution for the Korean economy (Halliday and Carruthers, 2009). Additionally, there was a major conflict between the various participants in the reform process about the design of the bankruptcy law. While a debtor-friendly law was preferred by the IMF, World Bank, economists, and firms, a creditor-friendly law was preferred by the lawyers, banks, judges, and the Korean public (who had little tolerance for a law that appears to coddle incompetent managers and owners) (Halliday and Carruthers, 2009). As noted by Halliday and Carruthers (2009, pp. 223–224), "The struggle can be observed in the switching back and forth between alternative sites of reform (. …) From early 1998 until 2005 the protagonists in Korea's bankruptcy reforms offered one solution after another" See also Oh (2003) and Halliday and Carruthers (2009), who note that almost every year, and occasionally several times a year, one kind of reform initiative or another followed in one or another lawmaking site.

[19] The IMF also demanded a modernization of the law in other countries that were affected by the Asian financial crisis, such as Indonesia. In contrast to Korea, the reform in Indonesia was passed closely after the crisis in 1998 (Halliday and Carruthers, 2009; Schoenherr and Starmans, 2022). This further emphasizes the conflicting opinions during the reformation process in Korea.

[20] Overall, the final outcome of the reform is a reflection of the demands of the different parties (as with the 1979 US bankruptcy reform, see Posner, 1997). While the law in general is a debtor-friendly law as demanded by some

For my empirical analysis, I define the date after which changes in the voting premium should have occurred by the enactment of the reform in 2005. Because of the different opinions, until the end there was uncertainty about whether the reform would be passed at all, and about important provisions of the new law (such as automatic stay or management stay) that essentially determine whether a bankruptcy procedure is creditor- or debtor-friendly, making it unlikely that participants made major adjustments before the reform was passed—in my case, to buy voting shares with a significant premium. Even if some adjustments were made in anticipation of the reform, major changes should have occurred when the enactment of the reform eliminated uncertainties. Later, I will show that high and low default probability firms followed parallel trends in the voting premium before the reform was passed, while firms with high default probability exhibited an increase in the voting premium relative to firms with low default probability closely around the enactment of the reform in 2005.

3. The voting premium as a measure of agency problems

3.1. Theoretical and empirical background

I measure private benefits of control by the voting premium in dual-class firms. The idea behind the voting premium as a measure for control benefits is that if control is valuable, this should be reflected in the price of voting shares, which allocate control. Because minority shareholders will never access private benefits of control, the voting premium reflects the expected price minority shareholders will receive when a large shareholder accumulates shares to form a controlling block (Zingales, 1994, 1995; Chung and Kim, 1999; Nenova, 2003; Doidge, 2004; Guadalupe and Pérez-González, 2010; Hong, 2013). Note that the voting premium not only depends on the size of control benefits but also on the probability of a control contest, as for a given control benefit the voting premium increases with the possibility of a control contest (Zingales, 1994, 1995; Chung and Kim, 1999; Nenova, 2003). As a result, possible changes in the voting premium as a reaction to changes in agency problems should be concentrated among firms for which a control contest is more possible, which typically is the case when existing ownership structure is more

groups, unlike their demands, the law did not include automatic stay or unconditional management stay provisions which reflects the demands of other groups.

dispersed.[21][22] Later, I will exploit this feature to study cross-sectional variation in possible changes of the voting premium.

The relation between the voting premium and the value of private benefits of control is not only theoretically given, but also empirically supported. Among others, Nenova (2003), Doidge (2004), Guadalupe and Pérez-González (2010), Hong (2013), and Gao and Zhang (2019) find that the voting premium is negatively related to improvements in corporate governance mechanisms, such as law enforcement, minority shareholder rights, competition, reporting standards, and board independence. Additionally, Doidge (2004) and Kim and Michaely (2019) find that the voting premium increases in firm characteristics that are typically associated with potentially extreme agency problems, such as higher firm age and a larger separation of ownership and control. Finally, Zingales (1994, 1995) and Chung and Kim (1999) show that the voting premium is closely related to a firm's ownership structure, consistent with the underlying mechanism of the voting premium as a measure for control value.

Following Zingales (1995) and Doidge (2004), I define the voting premium by the ratio of the price of a voting right to the price of a cash flow right:

$$VP = \frac{P_H - P_L}{P_L - rv * P_H}, \tag{1}$$

where P_H is the price of the high-voting share, P_L is the price of the low-voting share, and rv is the number of votes of a low-voting share relative to the number of votes of a high-voting share. Note that when the high-voting share has one vote and the low-voting share has no vote ($rv = 0$), the voting premium is simply given by $(P_H - P_L)/P_L$. In fact, this is the case for the analysis in Korea,

[21] Note that market prices reflect prices among minority shareholders. Large shareholders typically trade their blocks outside the market. This is why possible changes in the voting premium as a reaction to changes in agency problems should be stronger for firms in which the possibility to acquire control within the market is higher (although prices of voting shares held by insiders may increase as well). On this, see Chung and Kim (1999).

[22] Note that it is not necessary to have a majority ownership (more than 50% of the voting shares) to be the controlling shareholder. Typically, control is achieved with far less ownership (La Porta, Lopez-De-Silanes, and Shleifer, 1999). Also, it is not necessary to be a single controlling shareholder to access control benefits, as control benefits can be shared with other owners. Moreover, even in situations in which a majority owner exists, voting shares should be valuable, given that one can share parts of the control benefits or because future allocation of majority ownership is uncertain and votes are important to gain control in the future (see Zingales, 1995; Doidge, 2004, who also discuss events, such as family disputes or death of the owner, in which majority ownership breaks open). Overall, the probability of a control contest should generally increase in ownership dispersion, as dispersed ownership makes the acquisition of a controlling stake more possible and more valuable (as one does not need to share the control benefits).

where dual-class firms have ordinary shares with one vote and preference shares with no vote. In Section 6.2, to mitigate the concern of confounding events, I will also study changes in the voting premium of firms in other countries around the reform in Korea. Here, the refined measure of equation (1) allows to compare the voting premium across countries with different voting arrangements.

3.2. Potential problems of the voting premium

There are two potential problems with the voting premium as a measure of private benefits of control. The first problem is that the voting premium may be subject to measurement errors. That is, the voting premium is not only determined by control benefits, but also by other factors that are unrelated to control benefits.[23] However, this problem is less relevant in my study, given that I am not primarily interested in the size of control benefits, but rather in changes of control benefits as a reaction to changes in corporate governance. Moreover, the problem is mitigated by the fact that I compare the voting premium of high and low default probability firms, and there is no obvious reason to expect that a possible measurement error is disproportional across both groups of firms. Finally, in all regressions, I use firm fixed effects that account for unobservable time-invariant factors, and I furthermore control for firm and security variables that have been shown to be important determinants of the voting premium (Zingales, 1994, 1995; Nenova, 2003; Doidge, 2004). These variables include ownership structure, firm size, voting power, and differences in dividends and liquidity between high- and low-voting shares. For some analyses, I extend the list of controls by variables that are commonly used in the corporate finance literature, such as leverage, profitability, or Tobin's Q.

The second problem is that an analysis of dual-class firms might be subject to a selection bias problem. Specifically, my results may not be applicable for single-class firms if dual-class firms differ from single-class firms with respect to the relation between private control benefits and debt governance. One specific concern here is that agency problems in dual-class firms may be higher than in single-class firms, because in dual-class firms the wedge between control and ownership might be larger, and because especially firms with potentially large agency problems may adapt

[23] See Zingales (1994, 1995), Nenova (2003), Doidge (2004), and Levit, Malenko, and Maug (2021) for detailed discussions on possible determinants of the voting premium.

dual-class share structures to exploit this wedge.[24][25] However, two points are important to note in this context. First, the primary purpose of my study is to provide evidence on dual-class firms. As noted above, dual-class firms are widespread worldwide and additionally have become increasingly important in recent years. Given this, research on dual-class share structure is of great importance. Second, while my results are particularly useful for dual-class firms, they still may also be relevant for single-class firms. The potential upward bias in agency problems may be alleviated given that also single-class firms can separate control rights from cash flow rights by pyramid structures (Doidge, 2004). Furthermore, more recently, several studies suggest that firms may not adopt a dual-class share structure because of agency problems, but rather because such a structure allows firms protection from less-informed or short-termed outsiders (Bebchuk and Kastiel, 2017; Kim and Michaely, 2019; Aggarwal et al., 2021; Lel et al., 2021; Cremers, Lauterbach, and Pajuste, 2022), which additionally alleviates the potential upward bias.[26] In Section 6 below, I will show that the main results of this paper are supported when using alternative measures of control benefits that are also not based on the voting premium in dual-class firms, thereby further mitigating concerns of potential measurement errors and allowing for better inference on single-class firms.

3.3. The voting premium and takeover regulations in Korea

Takeover regulations can influence the validity of the voting premium as a measure of control benefits. For example, there can be a provision that restricts outsiders to acquire more than a certain percentage of voting shares. For a given level of control benefits, such a provision would reduce the voting premium by reducing the possibility of a control contest (Chung and Kim, 1999; Nenova, 2003) (similar to concentrated ownership). Likewise, there can be a provision mandating

[24] On the possible selection bias problem regarding studies of dual-class firms, see Doidge (2004), Gompers, Ishii, and Metrick (2010), and Kind and Poltera (2013).

[25] As indicated earlier, another reason is that debt may be special for solving agency problems in dual-class firms, given that traditional governance mechanisms may not apply for controlling shareholders due to their high degree of control (Masulis, Wang, and Xie, 2009; Dey, Nikolaev, and Wang, 2016; Bebchuk and Hamdani, 2017; Bebchuk and Kastiel, 2017; Aggarwal et al., 2021).

[26] Consistent with these arguments, Dyck and Zingales (2004, p. 566), who estimate control benefits in single-class firms, compare their findings to those of Nenova (2003), who estimate control benefits in dual-class firms, and conclude: "In spite of the different method used, there is a remarkable similarity in findings. Our estimates for countries like Mexico and Germany are identical, and the overall correlation between our measures is 0.59 for the raw measure and 0.62 for the refined measure (statistically different from zero at the 2 percent level)." Moreover, Kim and Michaely (2019) and Cremers, Lauterbach, and Pajuste (2022) find that dual-class firms on average do not have lower valuation and performance than comparable single-class firms.

that an outsider who acquires control must make a bid to the remaining shareholders to acquire their shares at the same price. Such equal price provisions (both between share classes and across share classes) can hamper takeover activity by making acquisitions more costly (Chung and Kim, 1999; Nenova, 2003; Varottil and Wan, 2021) and can moreover lead to zero voting premium between high- and low-voting shares even if the value of control is positive (Nenova, 2003). However, no such provisions existed in Korea during the sample period.[27][28]

In fact, Korean takeover regulations offer many additional features that further support the assumptions of the voting premium as a measure of control benefits. For example, the Korean takeover market is comparable to the market rule of the US, where takeovers are encouraged by refraining from regulations that may restrict takeover activity (Varottil and Wan, 2021).[29] Moreover, the Korean law stipulates that any acquirer who wants to acquire more than 5% of shares in a company outside the securities market may only do so through a tender offer at the same price to other shareholders, which makes off-market acquisitions costly and thus enables takeovers especially by forming coalitions within the security markets (Chung and Kim, 1999; Varottil and Wan, 2021). Based on this, Chung and Kim (1999, pp. 37–38) argue: "The Korean market for dual class equity closely approximates the assumptions behind theoretical models of voting premium. In Korea, there are general provisions that make it difficult for acquirers to offer unequal takeover bids to different classes of securities of target companies. Therefore, the value of the vote arises primarily from the opportunity to form coalitions without any formal takeover bid. Because of these

[27] A law that prohibited the acquisition of more than 10% of votes by an outsider existed until 1997, but was repealed to enhance managerial efficiency by facilitating control changes (Chung and Kim, 1999). A law requiring outsiders who acquire more than 25% of shares to make a tender offer at the same price to other shareholders was introduced in 1997, but was repealed shortly thereafter in 1998, as a response to the 1997–1998 Asian financial crisis in order to facilitate control changes (Varottil and Wan, 2021).

[28] Like country-level takeover regulations, also corporate charter provisions can influence the validity of the voting premium as a measure of private benefits of control. In particular, firms can include voting cap provisions that stipulate an upper limit of votes that an outsider can acquire, or coattail provisions that mandate equal treatment of shares in control changes (Nenova, 2003). I do not control for corporate charter provisions in my analysis. However, for ten randomly selected firms of my sample (five firms with high default probability and five firms with low default probability), I searched for such or similar rules in the annual reports. I could not find any. Note that, to affect my results, the possible omission of takeover provisions needs to be disproportionate across high and low default probability firms. Also note that while agency problems of low default probability firms should not increase as a reaction to reduced bankruptcy penalties, agency problems of high default probability firms should increase, which suggests that omitting takeover provisions rather lead to a downward bias of my results.

[29] For further reading on the Korean takeover market, see also Kim (2009), who provides empirical support that the takeover market in Korea is well functioning by studying Korean takeover regulations in the context of four case studies (SK Corporation's fight against Sovereign Asset Management, the contest for control over Hyundai, KT&G's fight against Carl Icahn, and LG and Carlyle's proxy contest against Hanaro Telecom).

unique features, the Korean securities market provides an excellent opportunity to study the determinants of voting premiums and to appraise the control value of a block of shares."

3.4. Debt governance and firm value as a measure of agency problems

Before proceeding, it might be instructive to explain why I use the voting premium to measure changes in agency costs, and not the firm value. Most studies infer changes in agency problems by looking at changes in the firm value, because potential agency problems should be reflected in the valuation of the firm (e.g., Gompers, Ishii, and Metrick, 2003; Harvey, Lins, and Roper, 2004). However, in the context of debt governance this method may not be very meaningful, as bankruptcy law not only affects the effectivity of debt governance but might also affect credit costs and distress costs, which in turn might affect firm value (Acharya, Amihud, and Litov, 2011; Vig, 2013; Mann, 2018; Canipek, Kind, and Wende, 2021; Schoenherr and Starmans, 2022). As such, possible changes in the firm value may not be because of a change in debt governance, but may come through changes in credit costs and distress costs. Note how looking at the voting premium addresses this problem. While the potential effect of changes in credit costs and distress costs affects high- and low-voting shares similarly by the cash flow component, the potential effect of changes in debt governance affects both share classes differently (presumably, less debt governance has a positive effect on the voting share, but a negative effect on the nonvoting share). The voting premium, therefore, allows to measure changes in agency costs without potential influences by one of the other two channels.

4. Data, summary statistics, and empirical method

4.1. Data

I begin the sample construction by identifying all firms with dual-class shares provided by Datastream during the sample period. For these firms, to be included in the sample, the following restrictions are required (Nenova, 2003; Doidge, 2004; Hong, 2013): (1) firms have at least two classes of shares with different voting rights, (2) both shares are publicly traded and listed on a domestic stock exchange, (3) the low-voting class is not convertible into the high-voting class, and (4) neither share class receives a fixed dividend independent of the other class nor is redeemable or callable at the option of the firm at a preset price (such securities are closer to debt than equity).

The sample period is from 2000 to 2009, that is, I study five years before and after the enactment of the reform in 2005. For some analyses, I extend the sample period to 2012. For each share class, I obtain Wednesday-to-Wednesday weekly data from Datastream for closing stock price, dividend yield, number of shares outstanding, and turnover. Following the voting premium literature (Doidge, 2004; Hong, 2013), for a given year, a firm is included in the sample only if it has at least 20 weekly observations. The data on other firm characteristics, including ownership and size (both as firm-level control variables) as well as the necessary variables to construct Altman's Z-score (as a firm-specific measure of default probability), come from Worldscope and are based on annual data. I exclude firms from financial (SIC codes 6000–6999) and regulated industries (SIC codes 4800–4949), and I exclude each firm-year observation without complete data on all dependent and control variables used in the main empirical analysis. Additionally, I exclude firms without data on Altman's Z-score, and I require each firm to have observations for the pre-reform and post-reform periods (Hong, 2013).[30] Finally, I winsorize all variables at the first and ninety-ninth percentiles to account for outliers. The final sample consists of 663 firm-year observations from 77 firms. For robustness, in some analyses, I additionally present results when also including firms without ownership data, which increases the sample size to 939 firm-year observations coming from 99 firms.

4.2. Summary statistics

The voting premium of equation (1) is computed by the weekly price data for each firm and averaged annually for each year. As for the voting premium, other variables that are based on weekly Datastream data are calculated weekly and averaged annually (Nenova, 2003; Doidge, 2004). The variables are defined in detail in Table A.1 in the Appendix. Table 1 provides summary statistics, separately for firms with high and low default probability, and for the periods before and after the reform. Based on the two-year average pre-reform (2003 to 2004) measure of default probability (Altman's Z-score; Altman, 1968), I divide firms at the median and define firms above the median bankruptcy probability distribution as high default probability firms and firms below the median as low default probability firms.

[30] For most of the sample firms, ownership information for 2008 are not available in Worldscope. In case of missing data for 2008, I use the ownership value from 2009 also for 2008. My results remain unaffected when excluding firm-years with missing ownership data for 2008.

Three points are worth mentioning. First, the average voting premium in Korea is 68% (see columns 1 and 6). In other words, corporate control is worth more than two thirds of the cash flow value (without controlling for differences in security characteristics), consistent with the notion that private benefits of control can be large in dual-class firms.[31]

Second, before the reform, the voting premium was 51% for firms with high default probability and 65% for firms with low default probability (see columns 4 and 9). In contrast, after the reform, the voting premium was 87% for firms with high default probability and 70% for firms with low default probability (see columns 5 and 10). This suggests that firms with high default probability exhibited an increase in the voting premium after the reform relative to firms with low default probability by 31 percentage points. In unreported results, I subtract the before-after reform difference in the voting premium of firms with high default probability from that of firms with low default probability, that is, I estimate a simplified version of the difference-in-differences regression of equation (2) below (i.e., without firm and year fixed effects and without controls). The increase in the voting premium of high default probability firms relative to low default probability firms is statistically significant at 5% level.

Third, on average, 35% of Korean shares are held by insiders (see columns 1 and 6), implying that ownership in Korea is relatively dispersed and thus providing the possibility for outsiders to accumulate control. In addition, the within-firm standard deviation of ownership suggests that ownership varies noticeably over time (see columns 3 and 8), which is broadly consistent with the view that there are no major takeover regulations in Korea that may restrict takeover activity.

4.3. Empirical method

If debt curbs agency problems in dual-class firms, the expectation is that the voting premium of firms with high probability of default increased after the debtor-friendly reform in Korea relative to firms with low probability of default. I test for the expected effect with the following difference-in-differences regression:

[31] My estimate of the average voting premium in Korea is similar to the estimates of existing studies (e.g., Nenova, 2003; Doidge, 2004; Hong, 2013). Also the estimates of the voting premium in the other countries of Section 6.2 are similar. Note that I generally have a lower number of firms than existing studies. The reason is that my sample restrictions are somewhat stricter (e.g., different than other studies, I exclude financial and regulated industries), in particular, with regard to data availability on ownership structure. For example, for a similar time period as in my paper, from 2002 to 2007, Hong (2013) identifies 100 dual-class firms in Korea without controlling for ownership. As noted above, I obtain 99 firms when also including firms without ownership data, which is similar to the analysis by Hong (2013).

$$VP_{it} = \alpha_i + \lambda_t + \eta Post_t + \gamma HighRisk_i + \delta(Post_t \; x \; HighRisk_i) + \boldsymbol{\beta X}_{it} + \varepsilon_{it}, \qquad (2)$$

where VP_{it} is the voting premium as specified in equation (1); i indexes firms, and t indexes time; α_i are firm fixed effects that account for time-invariant differences across firms; λ_t are year fixed effects that account for time-varying factors common to all firms; $Post_t$ is a dummy variable that equals one for the years after the bankruptcy reform was passed (2005 to 2009), and zero for the years before the reform was passed (2000 to 2004); $HighRisk_i$ is a dummy variable that equals one if the firm has a high probability of default (above the median of the bankruptcy probability distribution), and zero if it has a low probability of default (below the median); $\boldsymbol{X}_{it}$ are the above discussed time-varying firm and security characteristics that are possible determinants of the voting premium; ε_{it} is the firm-specific error term; and δ is the coefficient of interest, which measures the change in the voting premium of firms with high probability of default after the reform relative to firms with low probability of default (the difference-in-differences effect). Standard errors are clustered at the firm level, as the voting premium should be correlated over time within a firm.

5. Results

5.1. Main results

Columns 1 and 2 of Table 2 present the main results. Consistent with the hypothesis that debt induces discipline, columns 1 (without controls) and 2 (with controls) show that the coefficient on $Post_t \; x \; HighRisk_i$ is positive and statistically significant. That is, firms with high default probability exhibited an increase in the voting premium after the reform relative to firms with low default probability. The economic effect is notable. Column 2 shows that, relative to firms with low default probability, the voting premium of firms with high default probability increased by 41 percentage points after the reform. This implies an increase in the voting premium by 0.41 / 0.69 x 100 = 59% (calculated by the full sample average voting premium of high default probability firms, see Table 1), suggesting that performance pressure by debt is viewed as a powerful instrument for solving agency problems.

It is important to note that, given that pricing is forward-looking, the results also suggest that debt governance is not fully substitutable by other incentive schemes, consistent with the hypothesis that debt is special in solving agency problems in dual-class firms. To further confirm this, I

study the voting premium over a longer time period. In column 3, I extend the analysis by three years, from 2009 to 2012. Additionally, in column 4, I maintain the extended sample but also drop the three years right after the reform was passed, 2005 to 2007. As shown, the increase in the voting premium persists for many years after the introduction of the reform.

For robustness, in columns 5 to 10, I present the estimates of several alternative specifications. Specifically, column 5 presents the estimates when additionally controlling for corporate leverage, profitability, and Tobin's Q. Columns 6 and 7 respectively show the estimates when excluding penny stocks from the analysis and when considering a balanced panel in which firms have observations throughout the entire sample period. Column 8 reports the results when using the log of the voting premium as the dependent variable.[32] In column 9, I report the estimates for an extended sample that also includes firms without ownership data. Finally, in column 10, I show the results when repeating the empirical analysis by dividing firms into high and low default probability firms based on their default probability in the year before the reform (2004), instead of the two-year pre-reform average (2003 to 2004). As can be seen, throughout all specifications, the results are (qualitatively) similar to those of the main analysis in column 2.

5.2. Parallel trends

Comparing changes in the voting premium of firms with high default probability to those of firms with low default probability allows to account for confounding events common to all firms. However, a potential concern with my results is that a confounding factor affected the voting premium of high and low default probability firms differently. To mitigate this concern, in Figure 2, I plot changes in the voting premium for high and low default probability firms over time. Specifically, Panel A shows the evolution of the average voting premium for high and low default probability firms. To examine the statistical significance of possible changes, Panel B plots the yearly differences in the voting premium between high and low default probability firms relative to the

[32] Note that high and low default probability firms have about the same average voting premium (see the summary statistics in Table 1). This largely excludes the possibility that the voting premium of high default probability firms have increased relative to low default probability firms in terms of a percentage points change, but not in terms of a percentage change. As shown in column 8, using the log of the voting premium as the dependent variable to measure percentage changes in the voting premium yields similar results (the effect in column 8 is 55% and the implied effect from column 2 is 59%). In unreported results, I repeat the analysis using the log of the voting premium plus one to also consider observations with negative value. The estimated did coefficient and *t*-value respectively are 0.252 and 3.28. The number of firms and observations are as in column 2. Note that adding one to the voting premium considerably reduces the economic effect relative to the true size, given that the average voting premium is about 0.7.

difference in the year prior to the reform, 2004. As shown, while high default probability firms exhibited an increase in the voting premium relative to low default probability firms after the reform, high and low default probability firms followed parallel trends in the voting premium several years prior to the reform, suggesting that both groups of firms generally experience similar shocks to the premium and thus would have followed the same trend without the reform.

Notably, the voting premium increased right after the enactment of the reform from 2004 to 2005, and additionally from 2005 to 2006. This is consistent with the timing of the reform, given that the reform was only passed in March 2005 and thus parts of the 2005 voting premium may contain pre-reform levels (recall that the yearly voting premium is calculated by weekly data).[33]

5.3. Heterogeneity

To further support my results, I study variation in the increase of the voting premium across firms with high default probability. As noted earlier, changes in the voting premium as a response to changes in private benefits of control should be concentrated in firms in which the probability of a control contest is higher. Moreover, the effect should be stronger in firms in which potential agency problems are extreme. Following the voting premium literature (Zingales, 1994, 1995; Chung and Kim, 1999; Nenova, 2003), I use the existing ownership structure of a firm to proxy for the possibility of a control contest. The possibility of a control contest is high when ownership

[33] The voting premium also increased from 2008 to 2009. One explanation for this is that for some firms ownership structure may have changed. While changes in ownership might not affected the voting premium before the reform (when the effectivity of debt governance reduced agency problems and thus the influence of ownership structure on the validity of the voting premium as a measure of agency problems), changes in ownership might affect the voting premium after the reform (when the ineffectivity of debt governance increases agency problems). Although I control for ownership, the employed ownership data may not fully capture all relevant information (see footnotes 34 and 35 below).

is dispersed and low when ownership is concentrated.[34][35] I measure agency problems by firm age and firm size. Firm age is based on the current dual-class literature, which suggests that the potential benefits of dual-class share structure tend to decrease and the potential costs tend to increase over time (Bebchuk and Kastiel, 2017; Kim and Michaely, 2019; Cremers, Lauterbach, and Pajuste, 2022). Firm size is based on the notion that controlling a large empire may entail private control benefits (e.g., Hart, 1995; Zwiebel, 1996).

To test for the expected heterogenous effects, I divide firms with high default probability into two groups of firms with high and low ownership concentration/agency problems, and then compare each group to the control group of firms with low default probability. Risky firms are divided at the median, based on the two-year pre-reform average measures of ownership concentration and agency problems. Columns 1 to 6 of Table 3 present the results. Consistent with the cross-sectional predictions, the increase in the voting premium relative to firms with low default probability is stronger for those high default probability firms in which ownership is more dispersed (columns 1 and 2) and in which potential agency problems are stronger (columns 3 to 6). In fact, while the increase in the voting premium is still existing for risky firms with concentrated ownership and low agency problems, the increase is more than one third larger for risky firms with dispersed

[34] As data for ownership concentration, I use the ratio of the number of closely held shares by insiders (shareholders who hold at least 5% of the outstanding shares, such as officers and directors and immediate families, other corporations, or individuals) to the number of shares outstanding (Worldscope item 08021). This data item should offer the information needed, namely, the proportion of shares that are typically not traded on the market, and whether there is a majority owner in the firm (see footnotes 21 and 22). Note that an alternative method that is often used in the literature is to look at the ownership stake of the three largest shareholders. In unreported results, I compare country means of my ownership data (for the list of countries in Table 6 below and based on the period 2002–2016) to those provided by La Porta et al. (1998) who apply the alternative method. The correlation coefficient is 0.689, suggesting that both measures lead to similar results. An additional note on the ownership data used in my study is that the item indicates ownership not solely regarding voting shares but regarding to all shares. This makes it possible that the indicated ownership concentration is low, although ownership concentration with regard to voting shares is actually high. However, the concern is mitigated by the fact that insiders typically hold voting shares. Furthermore, in Korea, there are typically more voting shares than nonvoting shares, which additionally reduces the concern. Finally, the goal of my analysis is to examine whether possible changes in the voting premium are stronger for firms with dispersed ownership as compared to firms with concentrated ownership, and to the extent that possible measurement errors are similar across firms the ownership data should allow for a meaningful analysis.

[35] The probability that shares of minority holders will be demanded in a control contest might be nonlinear in ownership concentration. The probability may be lowest for high ownership concentration, highest for a medium concentration, and medium for dispersed ownership because here it might be that not all votes are pivotal in allocating control (Zingales, 1994, 1995; Nenova, 2003; Kind and Poltera, 2013). Additionally, the probability may also depend on other factors than ownership concentration. For example, Zingales (1994, 1995) and Nenova (2003) use the Shapley value which, besides ownership concentration, also accounts for the number, compensation, and interaction between the vote-holders. However, note that Zingales (1994) shows that a simple dummy for majority control yields almost identical results as the Shapley value. Finally, note that the goal of my cross-sectional analysis is to examine whether possible changes in the voting premium are stronger when a control contest is more possible, which should be achieved by comparing firms with dispersed ownership to firms with concentrated ownership.

ownership and high agency problems. Notably, heterogeneity in the effect occurs particularly across firm age, consistent with the notion that the potential benefits and costs of dual-class share structure change over time.

In columns 7 to 9, I examine whether the differential effects among risky firms are also statistically significant. Specifically, among risky firms, I directly compare firms with high and low ownership concentration/agency problems. As can be seen, risky firms with low ownership concentration (column 7)/high agency problems (columns 8 and 9) experienced an increase in the voting premium after the reform relative to risky firms with high ownership concentration/low agency problems.

Finally, in unreported tests, I repeat the analysis in Table 3 for safe firms, that is, I study variation in the voting premium across safe firms with differences in ownership concentration and agency problems. I find no differential changes in the voting premium among safe firms.

6. Confounding factors

As noted, a potential concern with my findings is that a confounding factor affected high and low default probability firms differently. The parallel trends between high and low default probability firms prior to the reform already mitigates this concern. Moreover, it is important to note that a confounding factor not only had to have a different effect on firms with high and low default probability, but also a different effect across firms with different levels in ownership concentration, size, and age, given the heterogeneities discussed above. In this section, I present several other pieces of evidence that further mitigate the concern of confounding events.

6.1. The 2007–2009 financial crisis

One specific confounding factor might be the 2007–2009 financial crisis. Figure 2 above shows when the observed changes in the voting premium occurred. As can be seen, the increase in the voting premium of high default probability firms relative to low default probability firms occurred shortly after the enactment of the law in 2005, and not in 2008 when the financial crisis began to affect the economy of Korea (Schoenherr and Starmans, 2022).[36] To further confirm this,

[36] As noted by Schoenherr and Starmans (2022), while the Korean economy was not directly affected by the subprime exposure, as an export-dependent economy Korea experienced lower growth rates in 2008 and 2009. Growth rates were back to pre-2008 levels in 2010.

column 1 of Table 4 presents the estimates of a shortened sample period from 2000 to 2007, which excludes the years after the financial crisis. As shown, changes occurred after the reform, but before the crisis. Finally, in column 2, from the main sample period 2000–2009, I exclude the 2008–2009 period during which Korea was affected by the crisis, and furthermore extend the sample period to 2012. As can be seen, the results remain unaffected when excluding the period of the financial crisis and persist for several years after the crisis. Taken together, the results suggest that my findings are not driven by the financial crisis.

6.2. Changes in the voting premium of firms in other countries

Next, I study whether in other countries firms with high default probability have exhibited a change in the voting premium relative to firms with low default probability around the reform in Korea. This analysis further mitigates the concern of confounding events by accounting for the set of possible confounding shocks commonly experienced by all countries, such as economic crises or international trends in corporate governance.

For simplicity, I only consider countries where the voting arrangement is the same across companies. The information regarding the voting arrangements come from Doidge (2004).[37] Additionally, I exclude Brazil and Italy from the analysis, as these countries have also introduced bankruptcy reforms around 2005.[38] For each country, the data collection and construction is as for

[37] I exclude countries where firms have different voting arrangements. For example, in Canada, firms can have high-voting shares with voting rights from 10 to 500 times the voting rights of low-voting shares (Doidge, 2004). The excluded countries are Australia, Canada, Finland, Mexico, South Africa, the US, and the UK. Given that there is no obvious reason why changes in the voting premium of high default probability firms relative to low default probability firms should be different across countries with different voting arrangements, my analysis should not be affected by the exclusion of these countries. Note: as shown in Table 5, my simplified analysis includes 61 dual-class firms. For a similar time period as in my analysis, over the period 2002 to 2007, Hong (2013) also identifies dual-class firms for the excluded countries and shows that the total number of these firms is 109 (the number of firms is 3, 34, 14, 3, 11, 36, and 8, respectively, for the above listed excluded countries), indicating that my simplified analysis accounts for more than one third of the expected full sample.

[38] Around 2005, Brazil and Italy introduced bankruptcy reforms with ambiguous predictions on changes in bankruptcy penalties. Specifically, Brazil introduced a reform in 2005 that allowed for a reorganization procedure similar to US Chapter 11 and thus may have reduced penalties, but also gave creditors a higher ranking on proceedings in case of firm liquidation and thus may have increased penalties by motivating creditors to press for liquidation. Similarly, Italy introduced a reform in 2005 that removed strict restrictions to enter reorganization and thus may have reduced penalties, but subsequently introduced a reform in 2006 that made several changes to speed up the previously lengthy process of firm liquidation and thus may have increased penalties (again, higher expected recovery rates may increase creditors' incentive to press for liquidation). In unreported results, I also include dual-class firms from Brazil and Italy to the analysis. The results remain unaffected. For the Brazilian reform, see Ponticelli and Alencar (2016) and Favara et al. (2017). For the Italian reforms, see Rodano, Serrano-Velarde, and Tarantino (2016) and Favara et al. (2017).

Korea, described in Section 4.1. In an additional specification, I also control for economic development (GDP per capita), which may differ across countries and may affect the voting premium.[39] The data are sourced by the World Bank. As for the firms in Korea, based on the two-year average pre-reform default probability, I divide firms into high and low default probability firms at the median of the bankruptcy probability distribution of all firms. Because the median Z-score here is 2.40, while it is 1.62 in Korea, I also present the results when dividing firms into high and low default probability firms at the 1.62 threshold. Table 5 provides the list of countries, number of dual-class firms, the voting arrangements for each country, as well as different summary statistics.[40]

Columns 3 (with controls) and 4 (with economic development as an additional control) of Table 4 report the results. As can be seen, in other countries firms with high default probability did not exhibit an increase in the voting premium relative to firms with low default probability after the Korean reform. Columns 5 and 6 present the estimates when dividing firms at the 1.62 threshold. As shown, the results remain unaffected.[41] In Panels A (2.40 threshold) and B (1.62 threshold) of Figure 3, I show changes in the voting premium for high and low default probability firms of other countries over time. As visible, high and low default probability firms followed parallel trends in other countries, both before and after the reform.

For robustness, I also directly compare changes in the voting premium of Korean firms to those of firms from other countries. Specifically, columns 7 and 8 respectively present the estimates when comparing risky firms from Korea to all firms from other countries and when comparing safe firms from Korea to all firms from other countries. As can be seen, the voting premium of risky Korean firms increased after the reform relative to firms from other countries. In contrast, the voting premium of safe Korean firms did not change after the reform relative to firms from other countries. Because Korean firms have on average a higher voting premium than firms from

[39] For comparability, for all countries, including Korea, here size is measured by the log of assets in USD, instead of the log of assets in the respective national currency as done for the single country analysis in Korea. Summary statistics for the other countries are given in Table 5. As a supplement, for Korea, the average log of assets in USD is 14.05.

[40] Note that some countries, such as Japan, China, and Singapore, banned dual-class firms during my sample period. Other countries, such as Indonesia, Malaysia, Philippines, Taiwan, and Thailand, are note included by conditions (3) and (4) of Section 4.1 (on country-specific rules of dual-class firms, see Nenova, 2003; Doidge, 2004). Finally, some countries, like India, are not included due to the data restrictions imposed in Section 4.1.

[41] In unreported results, I repeat the analysis in columns 3 to 6 of Table 4 using the log of the voting premium (and the log of the premium plus one) as the dependent variable to measure percentage changes in the premium. The results remain (qualitatively) unaffected.

other countries (see Tables 1 and 5), it might be the case that the voting premium of Korean firms have changed relative to firms from other countries in terms of a percentage points change, but not in terms of a percentage change. To address this, in columns 9 and 10, I repeat the analysis using the log of the voting premium as the dependent variable to measure percentage changes in the premium. As shown, also in terms of percentage changes the voting premium of Korean firms increased relative to firms from other countries, and especially so for risky Korean firms.[42]

Taken together, the results suggest that the findings in Korea are not driven by confounding factors common to all countries. Ultimately, the results boil down the identification problem to one in which a confounding factor not only needed to affect high and low default probability firms differently, but also needed to be a country-specific phenomenon in Korea.

6.3. Cross-country analysis and different measures of agency problems

Finally, I study whether the negative relation between agency problems and bankruptcy penalties also exists across countries, using the existing country estimates of three studies that apply different methods to measure the value of control. The goal of this analysis is to further support that the results in Korea are actually caused by the bankruptcy reform, and not by a confounding shock. Because two of the measures are not based on the voting premium in dual-class firms (see below), an important byproduct of the analysis is that it also mitigates concerns of potential measurement errors of the voting premium as a measure of agency problems and moreover allows for improved inference on the relevance of my findings for single-class firms.

The first estimate is by Morellec, Nikolov, and Schürhoff (2018), who measure the value of control by first using a dynamic model that identifies an optimal target leverage in the absence of agency conflicts, and then backing out agency conflicts from the difference between optimal target leverage and observed choice of leverage.[43] They study 12,652 firms across 14 countries from

[42] In unreported results, I repeat the analysis using the log of the voting premium plus one as the dependent variable to also consider observations with negative value. The corresponding did estimates for columns 9 and 10 respectively are 0.262 (*t*-statistic of 4.30) and 0.056 (*t*-statistic of 1.15). The number of firms and observations are as in columns 7 and 8.

[43] In Morellec, Nikolov, and Schürhoff's model, the controlling shareholder derives utility from its equity stake in the firm and can additionally capture parts of free cash flow as private benefits. Debt is beneficial for the controlling shareholder because it increases company value (modelled by the deductibility of interest payments) and thus the controlling shareholder's utility through the equity stake. Yet, debt also constraints the controlling shareholder by reducing free cash flow available for cash diversion. As a result, the controlling shareholder faces a debt trade-off, and as noted above, private benefits are defined as the difference between optimal target leverage (without agency costs, i.e., without cash diversion) and the observed choice of debt. Accordingly, private benefits can be reduced by

1997 to 2011, and find that on average private benefits of control represent 4.4% of free cash flows. The second estimate is by Nenova (2003), who, as in my study, measures private benefits of control by the voting premium in dual-class firms. Based on a sample of 661 dual-class firms across 18 countries in 1997, she finds that on average the value of control is 12.7% of the company value. The final estimate comes from Dyck and Zingales (2004), who measure control benefits using the difference between the price per share an acquirer pays for a controlling block and the market price of a share after the control change is announced. Based on a sample of 393 controlling block sales across 39 countries from 1990 to 2000, they find that on average corporate control is worth 14 percent of the firm value. Notably, all three studies conclude that control benefits vary widely across countries, suggesting an important role for country-specific factors (such as bankruptcy penalties) in shaping private benefits of control.

I measure bankruptcy penalties by following Canipek (2023) and using the creditor rights index of La Porta et al. (1998), which contains penalties by covering data regarding management dismissal during the bankruptcy procedure, and regarding the likelihood of a firm liquidation as the outcome of the bankruptcy procedure (e.g., determined by provisions that cover the ability of creditors to seize assets, and the inability of firms to seek reorganization without creditors' consent). As for the country-analysis above, I control for economic development. Additionally, I control for other variables that might affect agency problems or the validity of the voting premium as a measure of private benefits of control (Nenova, 2003; Dyck and Zingales, 2004; Fauver et al., 2017; Morellec, Nikolov, and Schürhoff, 2018). These variables include shareholder rights, rule of law, average board independence, and average ownership structure. Because the analysis uses country averages of the control benefits and of the explanatory variables, I only consider countries for which the dependent as well as independent variables are calculated by at least five observations to obtain meaningful results (La Porta et al., 1998). Table 6 provides the list of countries, the

regulations that mitigate the possibility of cash diversion (such as stronger shareholder rights or better law enforcement) or institutions that increase the positive impact of debt on company value. In my analysis, I take a financial contracting theory perspective (Grossman and Hart, 1982; Aghion, Hart, and Moore, 1992; Dewatripont and Tirole, 1994; Hart, 1995, 2000, 2001, 2017; Zwiebel, 1996; Benmelech and Bergman, 2008; Canipek, 2023). In particular, I interpret higher observed debt levels as a commitment that allows the controlling shareholder to increase firm value (or to secure financing ex ante). Importantly, the commitment role of debt is only valid if bankruptcy is penalized (Grossman and Hart, 1982; Aghion, Hart, and Moore, 1992; Hart, 1995, 2000). Hence, I expect that stronger creditor rights increase the positive impact of debt on company value and thus motivate the controlling shareholder for higher debt levels, which in turn reduces the difference between optimal and observed leverage (or, in other words, private benefits of control).

values for each measure of private benefits of control, and the values for the control variables. The variable definitions are again in Table A.1 in the Appendix.

Table 7 reports the results. For each of the three measures, I focus only on creditor rights as an explanatory variable in the first specification. In the second specification, I add the control variables. In columns 1 and 2, I begin with the measure of Morellec, Nikolov, and Schürhoff. As expected, firms in countries with stronger creditor rights have lower agency problems. The effect is not only statistically but also economically significant. In column 2, going from the softest to the toughest bankruptcy regime is associated with a reduction of private control benefits by 4 x 0.009 = 3.6 percentage points. Notably, column 1 suggests that creditor rights alone can explain about 55% of the cross-country variation in agency conflicts. Figure 4 shows graphically how dominant creditor rights seem to shape the value of control.

Next, columns 3 and 4 report the results for Nenova's (2003) measures that are based on the voting premium. As can be seen, stronger creditor rights are associated with lower agency problems (although statistically insignificant in the first specification). The magnitude of the effect is similarly important to that from my analysis for Korea. In column 4, a change in the creditor rights index from the lowest to the highest value is related to a reduction of the value of control by 23 percentage points. Column 3 shows that creditor rights can explain about 8% of the variation in private benefits of control across countries.

Finally, columns 5 and 6 present the estimates for the Dyck and Zingales (2004) measures. While the negative relation between private control benefits and creditor rights is statistically significant in the first specification, the introduction of control variables leads to a loss of the statistical significance. However, all coefficients have the expected sign. Moreover, it is important to note that debt is a governance device especially for firms with high default probability (Zwiebel, 1996; Hart, 2001). The use of country averages, therefore, undermines the importance of bankruptcy penalties as a device for curbing agency problems by also including firms with low probability of default.

In sum, the findings here confirm the results from Korea. Additionally, the results mitigate concerns that the voting premium as a measure for private benefits of control may be subject to

measurement errors and moreover suggest that the findings of this paper may also be important for single-class firms.[44]

7. Conclusions

Dual-class firms have become increasingly important in recent years. Dual-class share structure can be costly by creating potentially large agency problems between controlling shareholders and minority shareholders. Yet, dual-class share structure can also be beneficial by allowing insiders flexibility regarding less-informed or short-termed outside shareholders. Under academics and regulators, the central question in this context is how to allow dual-class firms, while at the same time finding ways to effectively limit expropriation of minority shareholders by controlling shareholders (Bebchuk and Kastiel, 2017; Kim and Michaely, 2019; Aggarwal et al., 2021; Lel et al., 2021; Cremers, Lauterbach, and Pajuste, 2022). In this paper, I study whether debt can reduce agency problems between controlling shareholders and minority shareholders in dual-class firms. To do so, I use two key features of debt as a governance device. First, it is only effective with bankruptcy penalties, second, it only matters for firms close to default (Grossman and Hart, 1982; Aghion, Hart, and Moore, 1992; Hart, 1995, 2000, 2001; Zwiebel, 1996; Canipek, 2023). I measure agency problems by the voting problem. Using a Korean bankruptcy reform that reduced bankruptcy penalties, I find that firms with high default probability exhibited an increase in the voting premium by 59% after the reform relative to firms with low default probability. This result suggests that debt is valued as a powerful mechanism for reducing agency problems.

My findings have several important implications. First, my findings underline the role of agency problems in shaping firm's capital structure. Theoretically, the view that capital structure

[44] It is important to note that the analysis here is only intended to offer a simple additional robustness test, and is not meant to present a comprehensive cross-country analysis of the relation between agency problems and bankruptcy penalties. Econometrically, the drawback of the analysis is that the relation between agency problems and penalties may be endogenous, given that firms with low default probability do not serve as a control group (however, note that, across countries, bankruptcy law is typically determined by a different reason—such as the 2007–2009 financial crisis for Germany, a corporate scandal for Italy, the 1997–1998 Asian financial crisis for Korea, an attempt to promote lending for Brazil, or the political power of competing groups for the US (Canipek, 2023)—, which mitigates the concern that an omitted country variable simultaneously determines bankruptcy law and agency problems for most countries). Additionally, in unreported results, I find that the statistical significance of the negative relation for the Nenova measure dissipates when also controlling for legal origin as a determinant of bankruptcy law (La Porta et al., 1998) (note that an obvious explanation for this is that the combination of five legal origins with only 17 observations may make the analysis meaningless). Finally, the observed findings for the Morellec, Nikolov, and Schürhoff measure may not be because firms increase debt as a result of an increase in the effectivity of debt governance (see footnote 43), but because firms increase debt as a result of changes in credit costs and distress costs (see Section 3.4).

can be used to reduce agency costs is largely established (e.g., Grossman and Hart, 1982; Zwiebel, 1996). However, empirical evidence is limited. Second, my findings have key implications for the design of optimal bankruptcy law. In particular, my findings suggest that bankruptcy law should preserve the governance role of debt by sufficiently penalizing management and controlling shareholders in default, as otherwise companies may have difficulties to commit to forgo inefficient actions and thus to obtain financing (Aghion, Hart, and Moore, 1992; Hart, 2000). Notably, while this aspect is important in general, it may be particularly relevant at present, given that many countries have significantly softened their bankruptcy law as a response to the recent crises.

Finally, and most important, my findings have important implications for the current debate in academia and politics on dual-class firms. My results suggest that debt governance, or, more generally, mechanisms that transfer control when performance is poor, can offer a solution to effectively mitigate the agency problems associated with dual-class firms. For policymakers, my findings imply that providing provisions that enable such mechanisms may be desirable. This can be done by subjecting dual-class firms to a bankruptcy law that removes control from the controlling shareholder in default. An alternative way, that may also be applicable for safe firms, is to include "control change provisions" that allow controlling shareholders to stay in control as long as performance is good but shift control when performance is bad (as in financial contracting and control change theories, see Aghion and Bolton, 1992; Hart, 2001, 2017; Kaplan and Strömberg, 2003). In the context of dual-class shares, the design of the provision should be straightforward. The control shift could be the change of the dual-class share structure into a single-class share structure (as in sunset provisions, see Bebchuk and Kastiel, 2017). The performance threshold could be the performance of comparable single-class firms.

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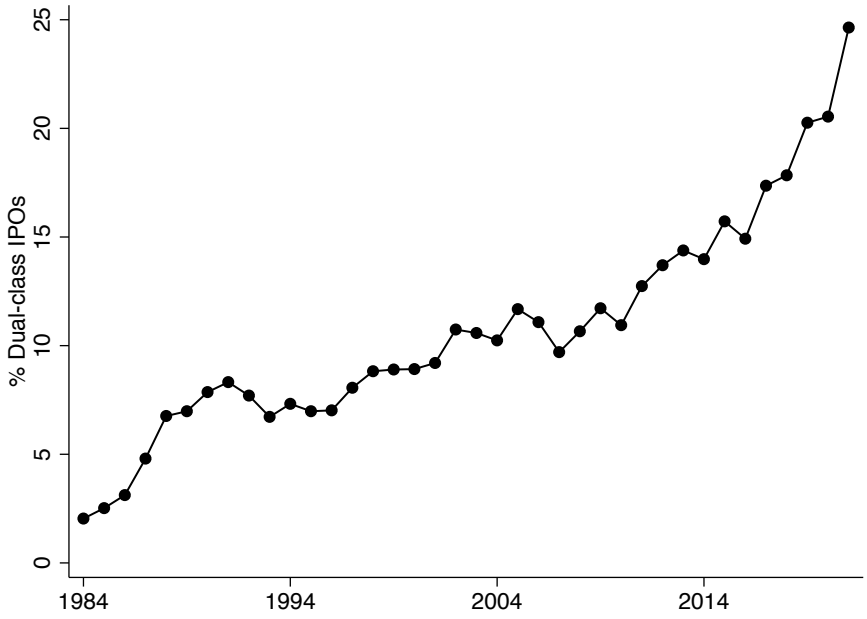
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Figures and tables

Panel A. Share of dual-class IPOs (five-year moving average)



Panel B. Share of dual-class IPO market capitalization

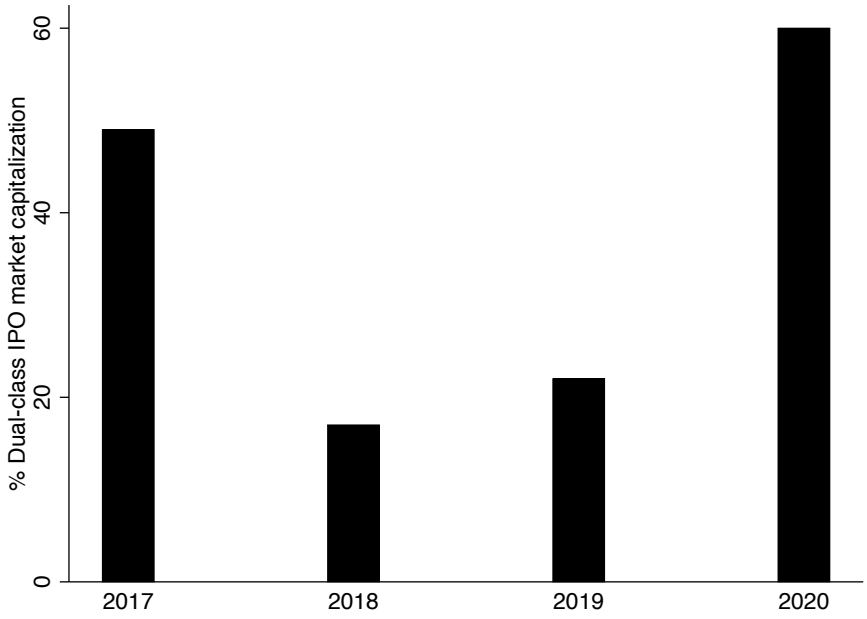
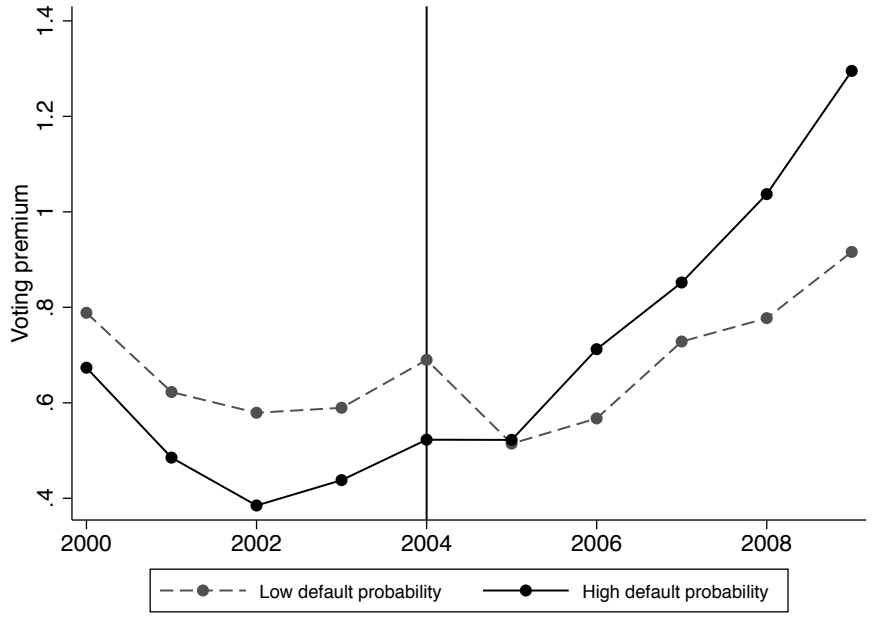


Figure 1
Dual-class IPOs in the US

Panel A shows the five-year moving average of the share of dual-class IPOs in all IPOs in the US. Panel B shows the share of dual-class IPO market capitalization in total IPO market capitalization in the US. The data on the share of dual-class IPOs come from Jay Ritter's website (https://site.warrington.ufl.edu/ritter/ipo-data/). The data on the share of dual-class IPO market capitalization are from the CII website (https://www.cii.org/dualclass_stock).

Panel A. Voting premium



Panel B. did estimate relative to 2004

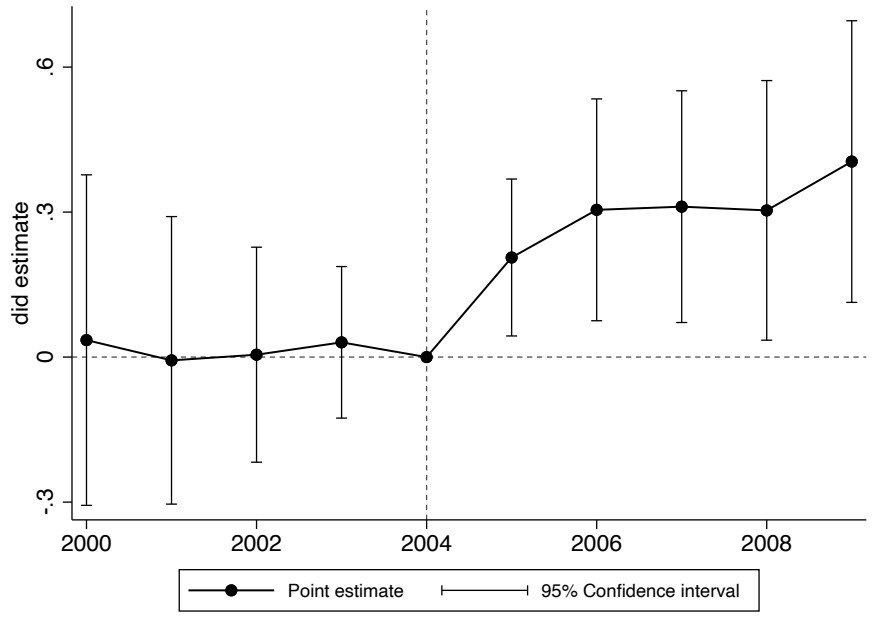
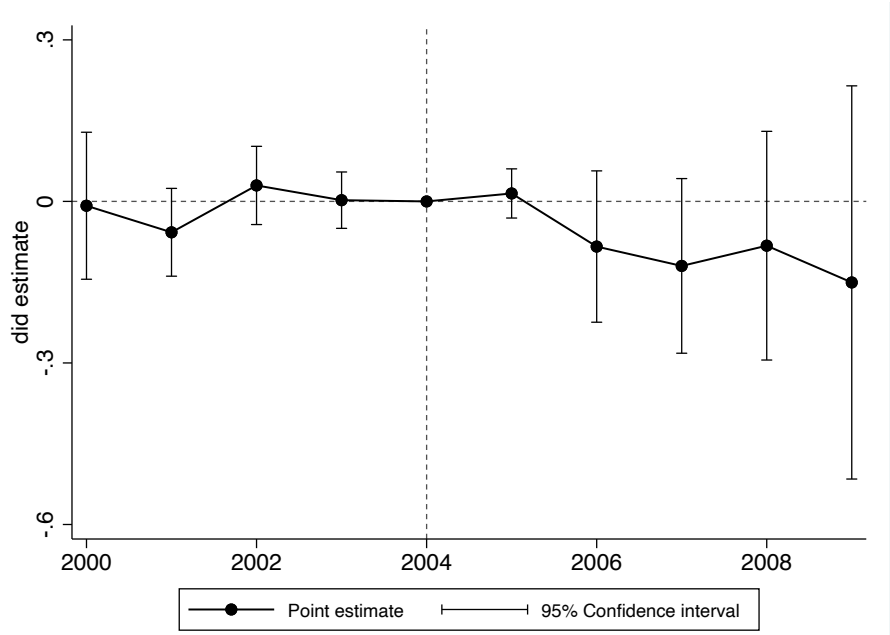


Figure 2
Bankruptcy reform in Korea and the voting premium

Panel A plots the average voting premium for high and low default probability firms. In Panel B, the black dots show the point estimates on the interaction terms between a set of time dummies and a dummy indicating firms with high default probability. The point estimates are related to the year prior to the reform, 2004. The grey bars present 95% confidence intervals for the point estimates. The dependent variable is the voting premium. The regression is specified as in column 2 of Table 2, i.e., with firm fixed effects, year fixed effects, controls, and standard errors clustered on the firm level. Detailed point estimates and *t*-values can be found in Table A.2 in the Appendix.

Panel A. did estimate relative to 2004 for the 2.40 threshold



Panel B. did estimate relative to 2004 for the 1.62 threshold

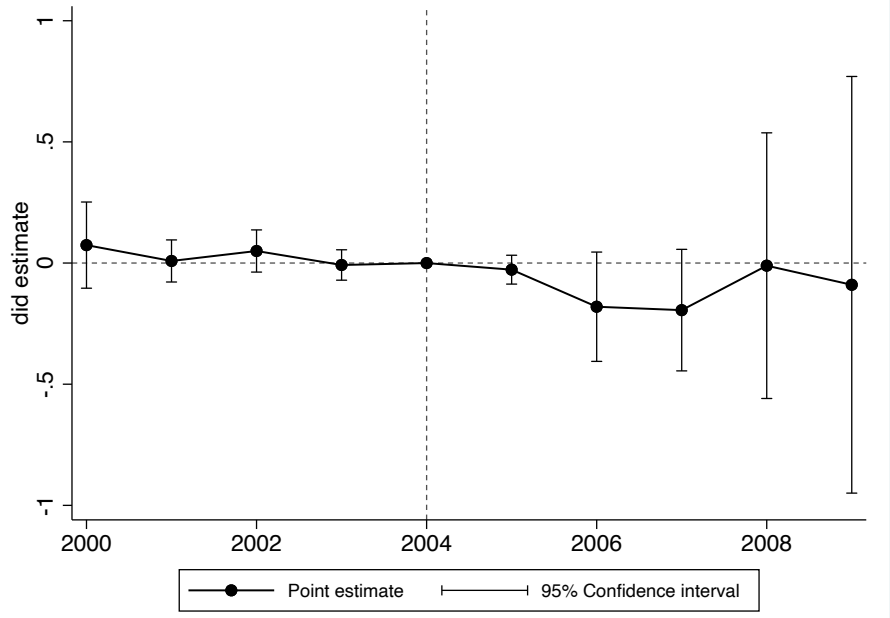


Figure 3
Bankruptcy reform in Korea and the voting premium of firms of other countries

In Panels A (2.40 threshold) and B (1.62 threshold), the black dots show the point estimates on the interaction terms between a set of time dummies and a dummy indicating firms with high default probability. The point estimates are related to the year prior to the Korean bankruptcy reform, 2004. The grey bars present 95% confidence intervals for the point estimates. The dependent variable is the voting premium. The regression is specified as in column 2 of Table 2, i.e., with firm fixed effects, year fixed effects, controls, and standard errors clustered on the firm level. Detailed point estimates and *t*-values can be found in Table A.2 in the Appendix.

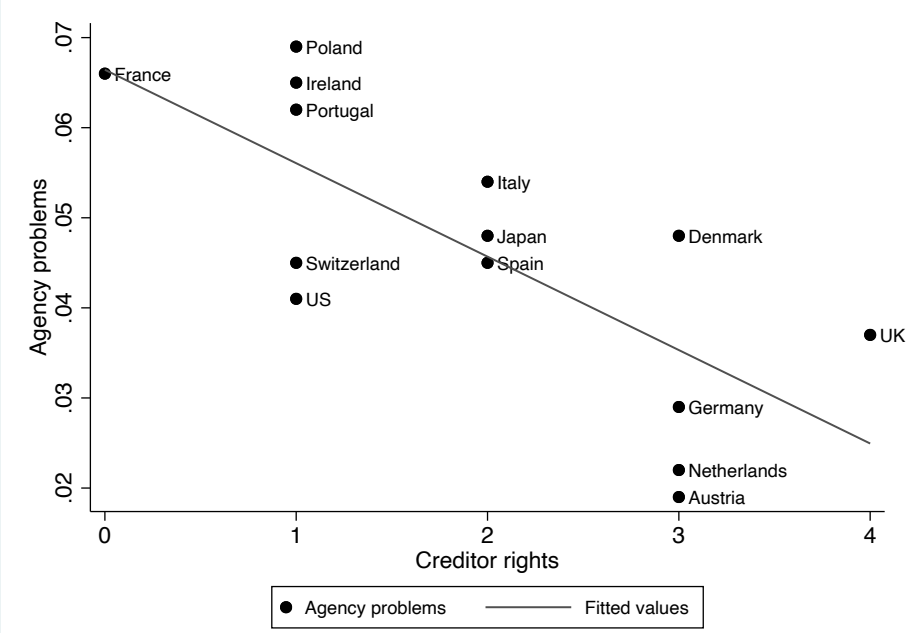


Figure 4
Agency problems and creditor rights across countries

This figure plots the relation between agency problems and creditor rights across countries. The black dots show the country estimates of agency problems from Morellec et al. (2018). The fitted line shows the slope of a regression of the control benefits on creditor rights (as shown in Table 7, the slope coefficient is -0.010 with a *t*-value of -3.72).

Table 1

Summary statistics

This table presents summary statistics for firms with high default probability (columns 1–5) and firms with low default probability (columns 6–10). The columns show: columns 1 and 6, average for all years (2000 to 2009); columns 2 and 7, standard deviation for all years; columns 3 and 8, within-firm standard deviation for all years; columns 4 and 9, average for the years before the reform (2000 to 2004); and columns 5 and 10, average for the years after the reform (2005 to 2009). Columns 11, 12, and 13 present *p*-values of *t*-tests of difference in means between high and low default probability firms for all years, for the years before the reform, and for the years after the reform, respectively. Refer to Table A.1 in the Appendix for variable definitions.

	High default probability					Low default probability							
	All years			Before	After	All years			Before	After			
	Mean	SD	Within-SD	Mean	Mean	Mean	SD	Within-SD	Mean	Mean	*p*-all	*p*-before	*p*-after
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Voting premium	0.688	0.982	0.420	0.510	0.871	0.677	0.798	0.358	0.647	0.704	0.87	0.15	0.10
Ownership	0.318	0.192	0.116	0.301	0.335	0.378	0.197	0.117	0.367	0.388	0.00	0.00	0.02
Size	21.18	1.817	0.346	21.07	21.30	20.97	1.787	0.309	20.74	21.17	0.13	0.09	0.55
Turnover	-0.510	1.157	0.839	-0.194	-0.834	-0.229	1.347	0.792	0.114	-0.548	0.00	0.01	0.05
Dividend dummy	0.490	0.501	0.243	0.401	0.581	0.716	0.452	0.308	0.647	0.780	0.00	0.00	0.00
Voting power	1.080	0.086	0.015	1.085	1.075	1.073	0.077	0.008	1.074	1.072	0.25	0.23	0.71
Leverage	0.379	0.173	0.104	0.395	0.362	0.231	0.168	0.081	0.255	0.209	0.00	0.00	0.00
Profitability	0.036	0.075	0.056	0.032	0.040	0.081	0.068	0.053	0.093	0.070	0.00	0.00	0.00
Tobin's Q	0.981	0.274	0.157	0.898	1.065	1.029	0.376	0.209	0.978	1.077	0.06	0.01	0.77
Altman's Z-score	1.138	0.886	0.551	0.967	1.322	2.660	1.317	0.819	2.391	2.912	0.00	0.00	0.00
Age	42.42	9.803	2.884	40.19	44.78	42.21	17.28	2.907	40.05	44.23	0.85	0.93	0.73

Table 2

Bankruptcy reform in Korea and changes in the voting premium

This table presents estimates of difference-in-differences regressions for the bankruptcy reform in Korea. The dependent variable is the voting premium in columns 1–7 and 9–10, and the logarithm of the voting premium in column 8. Post is a dummy variable that equals one for the years after the bankruptcy reform was passed (from 2005), and zero for the years before the reform was passed (before 2005). HighRisk is a dummy variable that equals one if the firm has a high probability of default (above the median of the bankruptcy probability distribution), and zero if it has a low probability of default (below the median). Columns 1 and 2 present the results for the main analysis. Column 3 shows the results for an extended time period from 2000 to 2012, and column 4 reports the results when maintaining the extended period but excluding the years right after the reform, 2005–2007. Columns 6 and 7 respectively show the estimates when excluding penny stocks and when considering a balanced panel. Column 9 reports the estimates for an extended sample that also includes firms without ownership data. Column 10 shows the results when dividing firms into high and low default probability firms based on their default probability in the year before the reform (2004). *t*-values are reported in parentheses and are based on standard errors clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

	Main results		Extended period		Robustness					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x HighRisk	0.395***	0.413***	0.408***	0.434***	0.383***	0.436***	0.488***	0.546***	0.229**	0.411***
	(3.67)	(3.94)	(3.42)	(2.69)	(3.74)	(3.65)	(4.00)	(3.39)	(2.55)	(3.85)
Post	0.181	0.162	0.272	0.244	0.098	0.169	0.175	0.136	0.077	0.169
	(1.61)	(1.34)	(1.64)	(1.40)	(0.76)	(1.23)	(1.20)	(0.70)	(0.80)	(1.38)
Ownership		-0.267*	-0.187	-0.213	-0.152	-0.356**	-0.276	-0.112		-0.329**
		(-1.75)	(-0.97)	(-0.87)	(-1.00)	(-2.07)	(-1.40)	(-0.41)		(-2.14)
Size		0.090	0.132	0.192*	0.080	0.046	0.190*	0.108	0.100	0.066
		(1.00)	(1.26)	(1.79)	(0.87)	(0.47)	(2.00)	(1.04)	(1.16)	(0.76)
Turnover		-0.009	-0.029	-0.039	-0.021	0.001	-0.008	0.007	-0.034	-0.021
		(-0.24)	(-0.66)	(-0.85)	(-0.56)	(0.02)	(-0.22)	(0.13)	(-1.09)	(-0.58)
Dividend dummy		0.024	-0.053	-0.087	0.039	0.053	-0.019	0.014	0.039	0.040
		(0.36)	(-0.58)	(-0.93)	(0.58)	(0.73)	(-0.18)	(0.16)	(0.72)	(0.58)
Voting power		1.114	2.604	2.911*	0.812	0.110	3.385*	1.459	1.006	0.872
		(0.85)	(1.47)	(1.67)	(0.61)	(0.09)	(1.82)	(1.11)	(1.38)	(0.67)
Leverage					0.154					
					(0.70)					
Profitability					0.065					
					(0.26)					
Tobin's Q					0.401***					
					(3.30)					
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	663	663	865	668	663	561	300	535	939	641
Number of firms	77	77	77	77	77	65	30	67	99	74
R^2 (within)	0.240	0.257	0.222	0.252	0.295	0.249	0.359	0.193	0.166	0.262

Table 3

Bankruptcy reform in Korea and changes in the voting premium: heterogeneity

This table presents estimates of difference-in-differences regressions for the bankruptcy reform in Korea. The dependent variable is the voting premium in all columns. Post is a dummy variable that equals one for the years after the bankruptcy reform was passed (from 2005), and zero for the years before the reform was passed (before 2005). Columns 1–6 report the results when comparing high default probability firms with different levels of ownership dispersion, age, and size to low default probability firms. Columns 7–9 report the results when comparing high default probability firms with high ownership dispersion/age/size to high default probability firms with low ownership dispersion/age/size. For columns 1–6, High is a dummy variable that equals one if the firm has a high probability of default (above the median of the bankruptcy probability distribution), and zero if it has a low probability of default (below the median). For columns 7–9, High is a dummy variable that equals one if the firm has high ownership dispersion/age/size (above the median ownership dispersion/age/size among high default probability firms), and zero if it has low ownership dispersion/age/size (below the median). *t*-values are reported in parentheses and are based on standard errors clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

	Ownership dispersion		Age		Size		Among risky firms		
	High	Low	High	Low	High	Low	Owner	Age	Size
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Post x High	0.524***	0.279**	0.600***	0.203*	0.530***	0.283**	0.234*	0.329**	0.242*
	(3.82)	(2.43)	(4.75)	(1.74)	(3.92)	(2.61)	(1.70)	(2.29)	(1.71)
Post	0.149	0.100	0.192	0.076	0.294**	-0.040	0.509**	0.458**	0.512**
	(1.11)	(0.76)	(1.49)	(0.55)	(2.14)	(-0.30)	(2.60)	(2.35)	(2.66)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	505	482	501	468	506	481	339	339	339
Number of firms	58	57	56	55	58	57	39	39	39
R^2 (within)	0.269	0.146	0.307	0.130	0.293	0.149	0.397	0.412	0.399

Table 4

Bankruptcy reform in Korea and changes in the voting premium: confounding factors

This table presents estimates of difference-in-differences regressions for the bankruptcy reform in Korea. The dependent variable is the voting premium in columns 1–8, and the logarithm of the voting premium in columns 9–10. Post is a dummy variable that equals one for the years after the bankruptcy reform was passed (from 2005), and zero for the years before the reform was passed (before 2005). Columns 1–2 are on Korean firms. Column 1 shows the results for the time period 2000 to 2007, and column 2 reports the results for the time period 2000 to 2012 but without the years 2008 to 2009. Columns 3–6 are on firms from other countries, and columns 7–10 are on Korean firms and firms from other countries. Columns 7 and 9 report the results when comparing risky Korean firms to firms from other countries, and columns 8 and 10 report the results when comparing safe Korean firms to firms from other countries. For columns 1–6, Exposed is a dummy variable that equals one if the firm has a high probability of default (above the median bankruptcy probability distribution of Korean firms for columns 1–2, above the median bankruptcy probability distribution of firms in other countries for columns 3–4, and below an Altman's Z-score of 1.62 for columns 5–6), and zero if it has a low probability of default (below the median bankruptcy probability distribution of Korean firms for columns 1–2, below the median bankruptcy probability distribution of firms in other countries for columns 3–4, and above an Altman's Z-score of 1.62 for columns 5–6). For columns 7–10, Exposed is a dummy variable that equals one for Korean firms, and zero for firms from other countries. *t*-values are reported in parentheses and are based on standard errors clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

			Voting premium in other countries							
	2007–2009 financial crisis		Other countries				Korea and other countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x Exposed	0.333***	0.357***	-0.004	-0.004	0.005	-0.003	0.364***	0.026	1.356***	0.780***
	(3.22)	(3.00)	(-0.08)	(-0.08)	(0.04)	(-0.03)	(4.25)	(0.40)	(4.78)	(2.80)
Post	-0.044	0.280	-0.127	-0.060	-0.130	-0.060	-0.081	-0.095	-0.324	-0.398
	(-0.39)	(1.61)	(-0.86)	(-0.35)	(-0.92)	(-0.39)	(-0.58)	(-0.57)	(-0.93)	(-1.10)
GDP				-0.645		-0.648	0.750	0.517	-1.155	-0.897
				(-1.35)		(-1.49)	(1.38)	(0.93)	(-0.64)	(-0.51)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	525	727	547	547	547	547	886	871	637	640
No. of firms	77	77	61	61	61	61	100	99	84	85
R^2 (within)	0.145	0.192	0.076	0.079	0.076	0.079	0.187	0.046	0.143	0.105

Table 5

Summary statistics for firms in other countries

This table presents summary statistics for firms in other countries. Panel A reports summary statistics by country. Panel B reports summary statistics for the 2.40 threshold (columns 1–6) and 1.62 threshold (columns 8–13), separately for firms with high default probability (columns 1–3 and 8–10) and firms with low default probability (columns 4–6 and 11–13). In Panel B, the columns show: columns 1, 4, 8, and 11, average for all years; columns 2, 5, 9, and 12, standard deviation for all years; and columns 3, 6, 10, and 13, within-firm standard deviation for all years. Columns 7 and 14 present *p*-values of *t*-tests of difference in means between high and low default probability firms for all years on the 2.40 and 1.62 thresholds, respectively. Refer to Table A.1 in the Appendix for variable definitions.

Panel A. Summary statistics by country

	Number of firms	Observations	Voting premium	Ownership	Size	Turnover	Dividend dummy	Voting power	Z-score	GDP	Voting arrangements
Austria	2	14	-0.513	0.627	13.59	0.432	0.643	1.482	1.684	10.71	Ordinary shares one vote, preferred shares nonvoting
Chile	5	49	0.080	0.610	13.92	1.285	0.490	1.637	2.600	9.30	A shares elect 6/7 directors, B shares elect 1/7 directors
Denmark	3	26	0.109	0.527	12.83	2.067	0.346	1.909	3.801	10.96	A shares ten votes, B shares one vote
France	3	25	-0.121	0.543	15.39	-1.217	0.600	1.129	1.719	10.59	Ordinary shares one vote, preferred shares nonvoting
Germany	24	216	0.198	0.468	14.40	1.253	0.736	1.704	2.422	10.58	Ordinary shares one vote, preferred shares nonvoting
Norway	2	15	0.105	0.530	14.37	-0.602	0.133	1.421	1.615	11.37	A shares one vote, B shares nonvoting
Sweden	16	153	0.042	0.291	15.10	3.157	0.131	7.267	2.851	10.80	A shares one vote, B shares 0.1 votes
Switzerland	6	49	0.225	0.379	13.93	0.040	0.429	3.483	3.023	11.17	Ordinary shares one vote, preferred shares nonvoting
Total/Mean	61	547	0.107	0.435	14.46	1.534	0.474	3.383	2.605	10.62	-

Panel B. Summary statistics for firms with high and low default probability

	2.40 threshold							1.62 threshold						
	High default probability			Low default probability				High default probability			Low default probability			
	Mean (1)	SD (2)	Within-SD (3)	Mean (4)	SD (5)	Within-SD (6)	*p* (7)	Mean (8)	SD (9)	Within-SD (10)	Mean (11)	SD (12)	Within-SD (13)	*p* (14)
Voting premium	0.179	0.879	0.189	0.036	0.219	0.089	0.01	0.119	0.804	0.314	0.103	0.587	0.088	0.81
Ownership	0.477	0.233	0.127	0.395	0.212	0.095	0.00	0.493	0.256	0.125	0.419	0.214	0.106	0.00
Size	14.62	2.069	0.276	14.30	1.839	0.294	0.06	14.22	2.362	0.268	14.53	1.826	0.290	0.12
Turnover	1.229	1.911	0.548	1.833	2.139	0.633	0.00	1.199	1.543	0.610	1.631	2.167	0.586	0.04
Dividend dummy	0.487	0.501	0.124	0.460	0.499	0.174	0.53	0.642	0.481	0.145	0.425	0.495	0.151	0.00
Voting power	2.369	2.580	0.259	4.379	6.495	0.458	0.00	2.522	3.565	0.440	3.633	5.389	0.336	0.03
Altman's Z-score	1.708	0.643	0.484	3.482	1.276	0.959	0.00	1.432	0.669	0.556	2.948	1.302	0.772	0.00

Table 6

Summary statistics for the cross-country analysis

This table presents summary statistics by country for the relation between agency problems and bankruptcy penalties across countries. Refer to Table A.1 in the Appendix for variable definitions.

	Morellec et al. (2018)	Nenova (2003)	Dyck & Zingales (2004)	Creditor rights	Board independence	Shareholder rights	Rule of law	Ownership	GDP
Argentina	.	.	0.27	1	0.470	4	5.35	0.53	8.91
Australia	.	.	0.02	3	0.592	4	10.00	0.28	10.75
Austria	0.019	.	.	3	0.487	2	10.00	0.58	10.67
Brazil	.	0.2319	0.65	1	0.378	3	6.32	0.57	9.10
Canada	.	0.0276	.	1	0.727	5	10.00	0.40	10.72
Chile	.	0.2314	0.18	2	0.266	5	7.02	0.45	9.22
Colombia	.	.	0.27	0	0.552	3	2.08	0.63	8.52
Denmark	0.048	0.0084	0.08	3	0.410	2	10.00	0.45	10.94
Finland	.	-0.0503	0.02	1	0.854	3	10.00	0.37	10.66
France	0.066	0.2805	.	0	0.345	3	8.98	0.34	10.57
Germany	0.029	0.0950	0.10	3	0.134	1	9.23	0.48	10.55
Hong Kong	.	-0.0288	0.00	4	0.394	5	8.22	0.54	10.09
Ireland	0.065	.	.	1	0.527	4	7.80	0.39	10.78
Israel	.	.	0.27	3	0.534	3	4.82	0.51	10.18
Italy	0.054	0.2936	0.37	2	0.448	1	8.33	0.58	10.51
Japan	0.048	.	-0.04	2	0.200	4	8.98	0.18	10.66
Malaysia	.	.	0.07	3	0.494	4	6.78	0.54	8.91
Mexico	.	0.3642	0.34	0	0.494	1	5.35	0.64	9.10
Netherlands	0.022	.	0.02	3	0.532	2	10.00	0.39	10.75
New Zealand	.	.	0.03	4	0.726	4	10.00	0.48	10.37
Norway	.	0.0583	0.01	2	0.427	4	10.00	0.36	11.34
Philippines	.	.	0.13	1	0.274	3	2.73	0.57	7.43
Poland	0.069	.	.	1	0.202	3	8.70	0.47	9.12
Portugal	0.062	.	.	1	0.235	3	8.68	0.52	9.98
South Africa	.	0.0672	.	3	0.528	5	4.42	0.52	8.74
South Korea	.	0.2894	0.16	3	0.300	2	5.35	0.23	9.75
Spain	0.045	.	0.04	2	0.369	4	7.80	0.51	10.31
Sweden	.	0.0104	0.07	1	0.537	3	10.00	0.28	10.76
Switzerland	0.045	0.0544	0.06	1	0.388	2	10.00	0.41	11.12
Thailand	.	.	0.12	2	0.443	2	6.25	0.47	8.29
Turkey	.	.	0.37	2	0.279	2	5.18	0.59	9.03
United Kingdom	0.037	0.0957	0.01	4	0.375	5	8.57	0.19	10.55
United States	0.041	0.0201	0.01	1	0.746	5	10.00	0.20	10.74

Table 7

Agency problems and bankruptcy penalties across countries

This table presents estimates of OLS regressions. The dependent variable is the estimate of agency problems from Morellec et al. (2018) in columns 1–2, the estimate of agency problems from Nenova (2003) in columns 3–4, and the estimate of agency problems from Dyck and Zingales (2004) in columns 5–6. *t*-values are reported in parentheses and are based on robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Refer to Table A.1 in the Appendix for variable definitions.

	Morellec et al. (2018)		Nenova (2003)		Dyck and Zingales (2004)	
	(1)	(2)	(3)	(4)	(5)	(6)
Creditor rights	-0.010***	-0.009***	-0.029	-0.058***	-0.056**	-0.027
	(-3.72)	(-5.01)	(-1.20)	(-3.89)	(-2.75)	(-1.23)
Board independence (country average)		-0.006		-0.319**		-0.051
		(-0.33)		(-2.77)		(-0.39)
Shareholder rights		-0.002		-0.009		-0.021
		(-0.50)		(-0.69)		(-1.23)
Rule of law		-0.008*		-0.067*		-0.027
		(-1.95)		(-2.21)		(-1.56)
Ownership (country average)		-0.025		-0.045		0.417*
		(-0.67)		(-0.23)		(2.02)
GDP		-0.006		0.072		0.027
		(-0.88)		(0.87)		(0.61)
Number of countries	14	14	17	17	26	26
R^2	0.549	0.773	0.079	0.778	0.166	0.529

Appendix

Table A.1
Variable definitions

Variable name	Variable definition	Source
Security characteristics		
Voting premium	Ratio of the price of a voting right to the price of a cash flow right. Or $(P_H - P_L)/(P_L - rv * P_H)$, where P_H is the price of the high-voting share, P_L is the price of the low-voting share, and rv is the number of votes of a low-voting share relative to the number of votes of a high-voting share. As the other security characteristics (following below) that are based on weekly Datastream data, for each firm the voting premium is computed weekly and averaged annually for each year. The security characteristics are defined following Doidge (2004).	Datastream and Doidge (2004)
Turnover	Logarithm of the ratio of the total turnover of the low-voting share to the total turnover of the high-voting share.	Datastream
Dividend dummy	Dummy variable that equals one if the low-voting share receives a larger dividend than the high-voting share.	Datastream
Voting power	Ratio of total votes attached to the high-voting share class relative to the ratio of total cash flow rights attached to the high-voting share class. Or $(NS_H + NS_L)/(NS_H + rv * NS_L)$, where NS_H is the number of high-voting shares outstanding and NS_H is the number of low-voting shares outstanding.	Datastream
Firm characteristics		
Altman's Z-score	Sum of 1.2 times net working capital divided by total assets, 1.4 times retained earnings divided by total assets, 3.3 times EBIT divided by total assets, 0.6 times market value of equity divided by total liabilities, and 0.99 times sales divided by total assets. Firms with low Z-score have high default probability and firms with high Z-score have low default probability.	Worldscope
Ownership	Ratio of the number of closely held shares by insiders (shareholders who hold at least 5% of the outstanding shares, such as officers and directors and immediate families, other corporations, or individuals) to the number of shares outstanding.	Worldscope
Size	Logarithm of total assets in thousands of KRW. For the analysis of firms in other countries in Section 6.2, total assets are in thousands of USD.	Worldscope
Leverage	Ratio of total debt to total assets.	Worldscope
Profitability	Ratio of EBITDA to total assets.	Worldscope
Tobin's Q	Ratio of total assets plus market value of equity minus book value of equity to total assets.	Worldscope
Firm age	Number of years since the date of firm foundation, or, in case of missing data, number of years since the date of firm incorporation. Note that more data are available for firm foundation than for firm incorporation, which is why the date of firm foundation is used as the default option.	Worldscope
Country characteristics		
Morellec et al. (2018) estimate of agency problems	Average agency problems in a country from Morellec et al. (2018), who measure agency problems by first using a dynamic model that identifies an optimal target leverage in the absence of agency conflicts, and then backing out agency conflicts from the difference between optimal target leverage and observed choice of debt. The data are based on the period 1997–2011.	Morellec et al. (2018)
Nenova (2003) estimate of agency problems	Average agency problems in a country from Nenova (2003), who measures agency problems by the price difference of shares with different voting rights in dual-class firms. The data are from 1997.	Nenova (2003)
Dyck and Zingales (2004) estimate of agency problems	Average agency problems in a country from Dyck and Zingales (2004), who measure agency problems by the difference between the price per share an acquirer pays for a controlling block and the market price of a share after the control change is announced. The data are based on the period 1990–2000.	Dyck and Zingales (2004)
GDP	Logarithm of the real GDP per capita. The data are in constant 2010 USD.	World Bank
Creditor rights	Aggregate index of creditor rights, following La Porta et al. (1998). The index is formed by adding: (1) one if secured creditors are able to seize their collateral after the reorganization procedure is approved, i.e., if there is no automatic stay on the firm's assets, and zero if the law imposes automatic stay on the assets; (2) one if the reorganization procedure imposes restrictions, such as secured creditors' consent, for a debtor to file for reorganization, and zero if debtor can seek reorganization unilaterally; (3) one if secured creditors are paid first out of the proceeds of liquidating the firm, and zero if other claimants, such as the government or workers, are given absolute priority; and (4) one if an administrator is automatically appointed for running the firm during the reorganization procedure, i.e., management is dismissed in the reorganization procedure, and zero if management retains corporate control during reorganization. The index ranges from zero to four and higher values indicate stricter penalties in bankruptcy. The data are from 2003 and come from	Djankov, McLiesh, and Shleifer (2007)

	Djankov, McLiesh, and Shleifer (2007), who updated and enlarged the data of La Porta et al. (1998).	
Board independence (country average)	Average of the ratio of the number of independent board members to the number of board members in a country based on the period 2002–2016.	Canipek (2023)
Shareholder rights	Aggregate index of shareholder rights, created by La Porta et al. (1998). The index is formed by adding one if: (1) shareholders are allowed to mail their proxy vote to the firm, (2) shareholders are not required to deposit their shares prior to the general shareholders' meeting, (3) cumulative voting or proportional representation of minorities (shareholders owning 10% or less of the capital) in the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a single shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10%, and (6) shareholders have preemptive rights. The index ranges from zero to six and higher values indicate better legal protection of minority shareholders. The data are from 1993. The data for Poland are from Pistor, Raiser, and Gelfer (2000).	La Porta et al. (1998) and Pistor, Raiser, and Gelfer (2000)
Rule of law	"Assessment of the law and order tradition in the country produced by the country risk rating agency International Country Risk (ICR). Average of the months of April and October of the monthly index between 1982 and 1995." The index ranges from zero to ten and higher scores indicate more tradition for law and order. The data are from La Porta et al. (1998). The data for Poland are from Pistor, Raiser, and Gelfer (2000).	Quotation from La Porta et al. (1998, p. 1124). Data from La Porta et al. (1998) and Pistor, Raiser, and Gelfer (2000)
Ownership (country average)	Country average of the percentage of common shares owned by the three largest shareholders in the ten largest, nonfinancial, privately owned, publicly traded, firms in a country. The data are from 1993 and come from La Porta et al. (1998). The data for Poland are based on the ownership data from Worldscope (defined above) and are based on the period 2002–2016.	La Porta et al. (1998) and Worldscope

Table A.2

Detailed point estimates and *t*-values for figures

This table reports the point estimates and *t*-values regarding Figures 2 and 3. *t*-values are reported in parentheses and are based on standard errors clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Figure 2 (Panel B)	Figure 3 (Panel A)	Figure 3 (Panel B)
	(1)	(2)	(3)
2000 x HighRisk	0.035	-0.008	0.074
	(0.20)	(-0.12)	(0.83)
Number of observations	131	111	111
Number of firms	77	61	61
R^2 (within)	0.278	0.367	0.377
2001 x HighRisk	-0.007	-0.057	0.009
	(-0.05)	(-1.41)	(0.20)
Number of observations	141	116	116
Number of firms	77	61	61
R^2 (within)	0.077	0.224	0.197
2002 x HighRisk	0.005	0.030	0.050
	(0.04)	(0.82)	(1.14)
Number of observations	140	119	119
Number of firms	77	61	61
R^2 (within)	0.208	0.139	0.148
2003 x HighRisk	0.031	0.002	-0.008
	(0.39)	(0.09)	(-0.25)
Number of observations	144	119	119
Number of firms	77	61	61
R^2 (within)	0.211	0.147	0.148
2005 x HighRisk	0.206**	0.015	-0.027
	(2.53)	(0.65)	(-0.92)
Number of observations	147	121	121
Number of firms	77	61	61
R^2 (within)	0.193	0.168	0.173
2006 x HighRisk	0.305***	-0.084	-0.180
	(2.64)	(-1.19)	(-1.60)
Number of observations	145	114	114
Number of firms	77	61	61
R^2 (within)	0.296	0.191	0.222
2007 x HighRisk	0.311**	-0.120	-0.194
	(2.59)	(-1.48)	(-1.55)
Number of observations	133	113	113
Number of firms	77	61	61
R^2 (within)	0.339	0.271	0.282
2008 x HighRisk	0.304**	-0.082	-0.011
	(2.25)	(-0.77)	(-0.04)
Number of observations	145	114	114
Number of firms	77	61	61
R^2 (within)	0.349	0.176	0.172
2009 x HighRisk	0.405***	-0.151	-0.090
	(2.77)	(-0.65)	(-0.19)
Number of observations	145	108	108
Number of firms	77	61	61
R^2 (within)	0.435	0.231	0.225
Firm controls	Yes	Yes	Yes
Country controls	No	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes