

Bankrupt Family Firms

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We study the role of family ownership during the bankruptcy process. We argue that at times of distress family blockholders are better positioned to manage the firm since they care about non-pecuniary benefits that the firm provides. We test this hypothesis focusing on the sample of public US corporations between 2001 and 2008. We show that family firms have faster bankruptcy resolution process, suggesting that they efficiently reduce the cost of distress. This also translates into higher recovery rates on debt and smaller drops in stock prices around bankruptcy filings, suggesting that neither creditors, nor minority shareholders are negatively affected by family blockholding. Family blockholders keep higher ownership stakes following the bankruptcy. The reduced cost of distress has implications for ex-ante borrowing yields.

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Introduction

When General Growth Properties, the second largest US shopping-mall manager, filed for Chapter 11 in April, 2009, its board was choosing between a \$10bn takeover offer from Simon Properties Group, a leading competitor, and \$2.6bn equity infusion from Brookfield Asset Management, a Canadian investment firm. Half of the board, controlled by the descendants of the firm's founders, preferred an offer from the investment firm. Although its offer was smaller, it provided a more independent arrangement for the future of the firm. The other half of the board, controlled by hedge fund investors, preferred an offer from the strategic bidder. The Wall Street Journal (February 17, 2010) cites Jim Sullivan, a real-estate analyst, saying that "You have a mercenary, a profit-motivated owner of 25% of the company in Bill Ackman, and you have a 25% owner in the Bucksbaum family that has deep emotional ties to this company and its assets. That's the setting for a very interesting board discussion." Although the family heir, John Bucksbaum, was squeezed out of the CEO's post, he publicly mentioned that he worried a lot about the 3,000 employees of the firm (Chicago Tribune, March 30, 2014).

Such anecdotal evidence suggests that different types of large shareholders view bankruptcy proceedings differently and such varying incentives during the bargaining process with the creditors may in turn affect the outcomes of Chapter 11 process. Indeed, firm value is affected by how fast shareholders and creditors come up with the reorganization plan. In this paper, we empirically investigate this issue in the sample of US firms over 2001-2008. We ask whether families manage Chapter 11 process differently from other types of blockholders and whether the differential behavior translates in better benefits to the other stakeholders of the firm – i.e., minority shareholders and lenders.

We rely on the intuition of Bebchuk and Chang (1992). When the firm is in Chapter 11, its value might change due to financial distress costs – that increase with the length of the negotiation process – as well as random shocks – that may increase or decrease firm value. During this process, the incentives of institutional investors or professional asset managers and families differ. The former, being motivated by

a purely financial resolution, might tend to drag the negotiation process in the hope of a positive random shock that increases firm value. The delay would therefore provide them with an option value on the firm's assets. Families, instead, may also have reputational concerns and care about the survival of the firm, which they have likely founded, their personal prestige or the welfare of its employees. Such non-pecuniary private benefits result in an additional negative cost to the family owners if the firm enters Chapter 7 and is liquidated. We argue that, due to this concern family firms have higher incentives to expedite the resolution benefitting both lenders and minority shareholders.¹

In addition to such non-pecuniary benefits, there might be additional reasons why family firms might improve on the bankruptcy process. Given that the firm is likely to represent a considerable share of their personal wealth, families are more incentivized to better handle bankruptcy procedures in order to recover part of their wealth. Moreover, families differ not only in terms of incentives but also in terms of the means to achieve them. Indeed, family blockholders tend to have closer relations with (or be a part of) the management team and this allows them to convey the information about the value of the firm to the creditors and reduce the information asymmetry which inevitably delays the bargaining process.

These concerns deliver our first hypothesis that families are keener in reducing costs of financial distress and reaching the resolution faster as compared to other owners with similar voting clout (i.e., similarly-sized blockholders). For example, families may bargain less aggressively with the residual stakeholders, or provide them with more trusted information about the value of the assets, thus achieving a faster closure of the bankruptcy proceedings. Such quicker resolution may reduce the deadweight costs associated with bankruptcy (e.g., unproductive time spent by the CEO). Also, given their willingness to preserve the firm, families might also inject new equity capital during the bankruptcy proceedings.

¹ These arguments assume that blockholders have some control over bankruptcy proceedings. This has been argued theoretically (e.g., Bebchuk and Chang, 1992; Acharya et al., 2011) and has also been confirmed empirically by the deviations from absolute priority rule in favor of stockholders (Eberhart et al., 1990; Franks and Torous, 1989). Recently, some arguments have been made about the decline in the equity-holder friendliness of the Chapter 11 process (Bharath et al., 2010). Our paper challenges this view by showing that directly or indirectly significant blockholders such as family firms are likely to influence the bankruptcy process.

Our second hypothesis investigates how other stakeholders benefit from the family involvement. On the one hand, a greater effectiveness in handling bankruptcy procedures and the larger value of the firm due to lower deadweight costs would benefit all the parties involved and make both minority shareholders and lenders appreciate family block ownership.

On the other hand, even if we observe a faster bankruptcy process, this would not be sufficient evidence that family firms benefit other stakeholders, e.g. creditors or minority shareholders. For instance, by being close to the management, families might threaten to squander time and precious resources around bankruptcy. The ensuing deterioration of firm value could force creditors into reaching a faster bargaining outcome but with lower recovery rates for lenders and the minority shareholders.

We consider a complete sample of public US corporations between 2001 and 2008. We compare different classes of blockholders: financial blockholders and family blockholders. The focus on investors holding a block allows us to control for potential differences in ownership concentration and to concentrate on the different owner types.

We start by looking at the effect of family blockownership on the firm's outcomes in Chapter 11 filings. We first focus on the exit from distress by looking at the time of reorganization. As in Bebchuk and Chang (1992), we consider the time of reorganization as a proxy for the costs of financial distress and thus faster resolution corresponds to higher efficiency and larger firm value to be divided among different classes of stakeholders. We document that family firms exit bankruptcy faster. Family block ownership is related to a 32% faster exit from bankruptcy, where the average time to exit is 446 days. This supports our hypothesis that when exiting distress, families behave differently from other blockholders. The fact that their ownership is associated with the solutions that are less costly for all stakeholders in general than the firms owned by financial blockholders provides evidence in favor of a positive impact on the bargaining process.

We then investigate how the gains of this higher efficiency are divided among different classes of stakeholders. We look at the recovery rates to measure the effect for lenders, stock price reaction around

the Chapter 11 filing to measure the ex-ante effect for minority shareholders and ex-post ownership to measure the effect for blockholders.

We find that the debt of family firms is associated with 12% higher recovery rates in the event of default, where the average recovery rate is 48%.² This suggests that lenders benefit from the family blockholders being in the firm during the bankruptcy process.

We next look at whether the other major stakeholders – minority investors – benefit from family's handling of bankruptcy. We look at the stock price reaction to the bankruptcy filings – i.e. the expected benefits from the bankruptcy process. In line with minority shareholders preferring family firms, we find that at the announcement of bankruptcy, the stock price drops less for firms with large family control than for other types of blockheld firms. Family blockownership is related to a 17-percentage-point smaller drop over the ten day period after the filing. Overall, these results support the hypothesis that family blockholders are beneficial to both lenders and minority investors.

Next, we investigate whether this higher effectiveness in managing bankruptcy of the family is linked to a higher probability of continuing ownership by the major blockholder. Indeed, Bebchuk and Chang (1992) argue that, given that equityholders have partial control of the length of the negotiation process and the associated financial distress costs, they should be rewarded with larger stake than their *ex ante* contractual right would entail. And indeed, if we focus on the firms that emerged from bankruptcy, we find that a one standard deviation higher family blockownership is associated with a 31% higher likelihood of retaining ownership stake in the firm.

When taken together these findings support our hypothesis that family blockholders are more efficient in handling bankruptcy process as they prefer to avoid Chapter 7 and reach the resolution faster. This also benefits lenders and minority shareholders alike.

² Note that because of equitable subordination clauses family owners are unlikely to be able to benefit from any loans they have provided to the firm prior to bankruptcy, even if they hold such.

Finally, we look at whether these *ex post* benefits of lower costs of distress translate into *ex ante* effects in the debt market. More specifically, if family blockowners manage the bankruptcy process more efficiently and in a way that is beneficial to lenders, family firms should command lower borrowing costs before the bankruptcy.³ However, if lower costs of distress are outweighed by a higher probability of bankruptcy, the creditors might be indifferent to families being blockholders in the distressed firms, or might even avoid them. Higher probability of distress may result from the fact that family firms value the private benefits of control in the firm, try to avoid equity financing and rather rely on debt to fund the expansion. So, while private benefits would reduce the cost of bankruptcy for creditors, they might increase the probability of bankruptcy with the net effect being uncertain.

To investigate this hypothesis, in the second part of the paper, we take the sample of all publicly listed US firms with public bonds and investigate whether bond yields are related to the equity ownership structure of the firm. Indeed, bankruptcy costs, recovery rates, and probability of bankruptcy are all major determinants of the bond prices. In our tests we are interested in varying the private benefits component of family ownership, which would let us separate whether *ex ante* cost of debt is positively or negatively affected by families valuing the survival of the firm. To address this issue, we exploit an identifying restriction based on state-level legal changes in inheritance taxes. We argue that inheritance taxes change the balance between monetary and non-pecuniary private benefits by making private benefits *relatively* more important if the monetary value is reduced. In particular, if the inheritance taxes that the firm's owners face rise, the private benefits become relatively more important compared to the monetary benefits of the firm, and thus the owners of the firm are more likely to care about the reputational concerns of the firm and care relatively less for their monetary wealth.

We thus consider a difference-in-difference estimation exploiting variation in state-level changes in inheritance taxes. We focus on four types of inheritance taxes: estate, inheritance, gift and generation

³ Traditionally, it has been argued that families are better perceived by the lenders because they engage less in wealth transfer at the expense of the lenders (e.g., Anderson et al., 2003) or in risk shifting before the bankruptcy (e.g., Eckbo and Thorburn, 2003; Gopalan et al., 2007). Experimental evidence also suggests that reputation reduces risk shifting (Hernandez et al., 2016). These arguments rely on the intuition that families reduce the *probability* of default. We argue, instead, that families also have a positive role in reducing the *cost* of default.

skipping taxes.⁴ We show that, controlling for firm-fixed, time-fixed effects and a variety of firm and bond specific characteristics, the cost of debt of family firms decreases when the inheritance tax rises. For each additional increase in value of the inheritance tax index, family blockownership is related to 90bp lower bond yields. These findings support the hypothesis that the differential behavior of family blockholders is beneficial to lenders and translates into them willing to lend at lower interest rates.

Our results provide a new look at the role of family ownership in the financial markets. We contribute to three main streams of literature. First, we contribute to the literature on bankruptcy (e.g., Eberhart et al., 1990; Franks and Torous, 1994; Welch, 1997; Eberhart and Weiss, 1998; Thorburn, 2000; Bris and Welch, 2005; Bris et al., 2006; Li, 2013; Ivashina et al., 2016). This strand of research has mostly focused on the procedural forms of restructuring and how they affect the outcome and the reallocations to different classes of creditors and claimants. Only recently, the focus has shifted to the role played by some specific types of investors (e.g., private equity funds in Hotchkiss et al., 2014), and by managerial incentives (e.g., Eckbo and Thorburn, 2003; Goyal and Wang, 2016). Previous literature has also looked at how the ownership of the debt claims matters in the bankruptcy proceedings (Hotchkiss and Mooradian, 1997; Jiang et al., 2012) or how business groups deal with bankruptcy (Gopalan et al., 2007). We contribute by focusing on one specific and very important class of *equity* holders – family blockholders – and show how their presence reduces bankruptcy costs. Looking at family blockholders who have invested long before the firm entered distress mitigates some endogeneity problems in ownership literature. Also, family blockholders tend to have closer relations (or be a part of) management team and this makes them particularly influential during the bankruptcy proceedings where most equity holders lose their ability to control the firm. Kalay et al. (2007) have shown that Chapter 11 costs vary across firms. We contribute by showing how such costs can be related to the incentives that controlling shareholders have.

⁴ Similarly to Heider and Ljungqvist (2015), we identify on tax changes rather than on the actual tax rates since owners are likely to face different effective tax rates.

Second, we relate to the literature on block ownership and family firms, and in particular to its impact on the debt market. The evidence on the link between family ownership and the cost of debt is mixed. On the one hand, Ellul et al. (2009) use international bond issues data to show that the presence of a family ownership overall increases the cost of debt while Lin et al. (2011) show that the cost of debt financing is *higher* for firms with a wider divergence between the largest ultimate owner's control rights and cash-flow rights, and this effect is particularly strong among family-owned firms. On the other hand, Anderson et al. (2003), using the sample of 252 industrial firms from the Lehman Brothers Index database and the S&P 500, document that family ownership is associated with a *lower* cost of debt, although they do not examine the channels behind this lower cost. Davydenko and Strebulaev (2007) show that firms with owners with high bargaining power in strategic default (e.g. the firms with high managerial ownership) have *higher* costs of debt.

We contribute to this literature by showing how one particular channel – the effectiveness in handling bankruptcy – translates into *lower* ex post bankruptcy costs and *lower* cost of debt. In contrast to the literature on divergence between control and cash-flow rights, we claim that the private benefits of control may better align the interests between family owners and debt holders.

Finally, we empirically highlight the importance of non-pecuniary private benefits in the governance of the firm and their role in affecting its cost of distress. Although non-pecuniary private benefits have been heavily studied in the theoretical literature (Aghion and Bolton, 1992; Hart, 2001), showing their importance empirically, especially among US firms, has been challenging. One seminal exception is provided by Demsetz and Lehn (1985) who, by acknowledging that they “have no systematic procedure for determining when dominant owners are more likely to exercise their personal preferences in non-profit-maximizing way“, perform the cross-industry analysis based on amenity values of mass media and sports industries. Gompers et al. (2010) additionally claim that firms with the founder's name and where firms are “the only game in town” would carry higher private benefits of control. Our contribution is to explore the setting in which the private benefits become especially important – bankruptcy proceedings

for family owners – as well as to provide an identification strategy – inheritance tax changes – that helps to identify private benefits of control. We also show the positive effects of non-pecuniary private benefits on the market value of the firm.

2. Data

We now describe the data that we use as well as how we construct the main variables. We further discuss our identification strategy used in some of our empirical tests.

2.1 Data Sources

Our sample is made of US publicly listed firms over the period of 2001-2008. In our sample, we include family firms, non-family blockheld firms as well as widely held firms without a significant blockholder.

We start constructing our main measure of individual ownership using time series data from the Bureau van Dijk databases. For the period of 2006-2008, we use the Orbis database, while for the period 2001-2005, we rely on Osiris database. Orbis contains ownership, financial and corporate governance data for over 16 million firms across the globe (as of July, 2008). Osiris is a subset of Orbis for all global listed firms. We manually identify the type of the owner by searching for their identity on the internet and use a name matching procedure to verify that the name of the reported owner is the same across all years. We double check the data from Bureau van Dijk to the company filings, and in addition, in our analysis on the bankruptcy proceedings, we provide robustness checks using the ownership data as reported in the bankruptcy filings. We restrict our sample to non-financial firms.

Bureau van Dijk collects the ownership data in a similar manner as in the other related studies. Our summary statistics are comparable to those in Anderson and Reeb (2003), Dlugosz et al. (2006), Villalonga and Amit (2006) and other studies on block ownership in US public firms.

Our data on bankruptcy filings are based on the Chapter 11 filings of US public firms reported in BankruptcyData.com, supplemented with the filings reported in UCLA-LoPucki Bankruptcy Research

Database. We get over-the-counter (OTC) equity prices around bankruptcy filings from Pink Quote (also known as Pink Sheets), an electronic quotation system that displays quotes from broker-dealers for many OTC securities. The recovery rates for the securities of the filing firms are extracted from the Standard&Poors CreditPro database (formerly known as LossStats database). We start with 506 publicly listed firms that filed for bankruptcy over our sample period (2001-2008). As reported by Jiang et al. (2012), around 300 publicly listed companies filed for bankruptcy in 2001-2007. After matching with ownership data, our final sample used for bankruptcy analysis consists of 191 cases. This sample is comparable to the ones of Ivashina et al. (2016) who study 136 large bankruptcy filings over 1998-2009 and Davydenko et al. (2012) who study 175 bankruptcy filings over 1997-2010. It also varies considerably in different specifications, as we require data to be matched to other datasets, e.g. to Pink Sheets records of OTC trading.

In all our specifications, we control for the financial characteristics of the firm such as tangibility of assets, profitability (return on assets), leverage, and the logarithm of asset size in the fiscal year prior to the bankruptcy filing.

2.2 Ownership Measures

Our empirical analysis relies on identifying the firm's largest (ultimate) blockholder as well as its power of control. We use two empirical proxies for the latter, both of which are based on the ownership data from the Orbis database.⁵ The fact that Orbis has ownership data for all the public and a large sample of private US firms allows us to track the ultimate blockholders of each public firm in the United States. Because some US firms are owned by foreign blockholders, we also exploit the global Orbis database.

The first proxy identifies the controlling blockholder by estimating who holds the largest fraction of the firm's voting rights. Following the literature (e.g., La Porta et al. 1999), we apply the weakest link principle (WLP). In particular, we calculate the minimum percentage of voting rights in the control path

⁵ Orbis reports only voting rights, so the reported ownership that we use takes into account dual voting rights and other publicly reported deviations from a one share-one vote policy. We are unable to observe ownership via nonvoting shares and thus we are unable to estimate cash flow rights of the blockholders or their control wedge.

from a subject company up to the ultimate owner.⁶ The second proxy relies on the fact that the control power of any ultimate blockholder depends on the blockholding fraction of the other blockholders in the firm. We capture this control power by using a version of the Shapley–Shubik Index (SSI) for oceanic games as adjusted for pyramidal structures. This continuous measure accounts for the ownership shares of other blockholders and yields the probability that a specific blockholder is in a winning coalition of a voting game. A detailed description of the derivation and use of the SSI is given in Appendix 1. Because the results are the same irrespective of which measure is used, in the interest of brevity, we mostly report the findings based on the second measure, which is a more comprehensive indicator of controlling power.

We build the ownership structure looking at all the layers of control. For example, imagine firm A with three major investors: firm B1, firm B2, and firm B3. Each one of these firms is owned by a different set of owners. We proceed as follows. For each shareholder of firm A, we extract information about its immediate shareholders (i.e., firms B1, B2, and B3). Then, for each one of these immediate shareholders (B1, B2, and B3), we extract information about their own immediate shareholders, and so on. We proceed up till when we reach the ultimate shareholder.

Some public firms have private firms as their ultimate owners. For some of these private firms ownership data is not available. If these private firms without identified ownership are industrial companies, we assume that the public firms that they own are family-owned. This choice follows Faccio and Lang (2002) and Claessens et al. (2000). If, instead, these private firms are financial companies – i.e., banks, insurance companies, mutual, pension, private equity, venture capital, hedge funds, other financial firms, or state or local government owned – we assume that the public firms they own are non-family owned. Finally, if a firm has no shareholders with a stake greater than 10%, we consider it to be widely dispersed (e.g., La Porta et al. 1999) and set SSI measure to zero.

We interchangeably refer to firms owned by individual blockholders as family firms, even if we do not concentrate on whether they actively exercise control in the firm. Given that our sample consists of

⁶ Although pyramidal ownership structures are less common in the US than in other countries, with this methodology we are able to capture family ownership through trusts. Many family firms in the US are held through the trust structures.

publicly listed firms and it is rare for an individual to acquire a new block in a publicly traded firm, we believe that most individuals formed their blocks before the IPO of the firm and are related to the founders of the family. Even if they are not members of the founding family, we consider that the emotional concerns of individuals are significant in the borrowing decisions of the firms that they own.

In our empirical analysis, we focus on comparing the effect of the family block size to the effect of non-family (i.e. institutional ownership) block size. As we posit that the effect should come from private benefits of control, such effect should be higher with a higher voting control that the stakeholder has. Also, in this way, we take care of the potential issue that some of the results might be driven by individual investors holding blocks of different size than institutional investors do.

For the Chapter 11 cases, in Appendix 2, we report family firm observations, together with the family name and control stake. One could claim that the controlling ownership can change over the course of bankruptcy proceedings. Indeed, after the filing for Chapter 11 bankruptcy protection, the controlling owners might sell their shares to the outside investors, for example, to the hedge funds that predominantly invest in distressed stocks ("vulture funds"). Although we do not see the identity of the trades in Pink Sheets, we investigated whether there have been large blocks of ownership changing hands. We did not find any. We also manually screen SEC filings to double check the ownership stakes that were retained by family firms after the bankruptcy process has been completed.

In all our regressions we also control for whether the firm has any large blockholders to start with. That is, our regressions include all firms, including those that are widely held. A complete list of the other variables used in our analysis is provided in Appendix 3 and the descriptive statistics reported in Table 1.

In Table 1, Panel C, we compare family and non-family blockheld firms across different firm characteristics. Family firms refer to the firms with at least 10% individual block at the time of bankruptcy while financial blockheld firms refer to the firms with at least 10% non-individual block at the time of bankruptcy. While we cannot control for unobservable differences, we see that there is no significant difference between family and non-family held firms in terms of basic financial and capital

structure characteristics. In addition, we report the number of issuances per firm, mean maturity for its loan, mean issue size, average presence of the collateral (which for every instrument is defined as 1 if it is secured), as well as the standard deviation of these security characteristics. This latest variable measures the complexity of capital structure. We do not find that neither the number of issuances, nor the mean characteristics differ in the subsamples of family and financial block-held firms. Also, there is no evidence that complexity is different along any of the key dimensions: maturity, collateral, issue size.

We also try to look at whether family firms and financial block-held firms differ in when they file for bankruptcy after facing financial constraints. We have collected data on covenant violations and then for each firm we have measured the time difference between the earliest covenant violation in our sample and the bankruptcy filing date (conditioning on such time difference being larger than 0). We do not find that such difference is significant between family and non-family blockheld firms.

3. Speed of Financial Resolution

We start by analysing the firms that file for Chapter 11 bankruptcy proceedings. We first look at the outcomes of the filings. Our hypothesis posits that, compared to the firms controlled by financial blockholders, family firms are more effective in managing bankruptcy and therefore come up with solutions that are less detrimental to all stakeholders combined. We start by looking at the time of reorganization of Chapter 11 bankruptcy proceedings, which directly relates to the bankruptcy costs (e.g. Bebchuk and Chang, 1992). For instance, LoPucki and Doherty (2004) suggest that doubling the time that a case remains pending increases legal and other fees by 57%. We expect family control to be positively related to a faster speed of exiting bankruptcy.

We collect the data on the filings from the datasets of BankruptcyData.com and UCLA-LoPucki Bankruptcy Research Database. Both of them capture the information on the bankruptcy filings of all US public firms and the largest US private firms. We then relate the time of reorganization to the type of

ownership of the firm filing for bankruptcy proceedings by estimating a Cox proportional hazards model on the time of reorganization.

In Table 3, we report the hazard rates from the Cox proportional hazards model on the time of reorganization. Column (A) reports the specification in which we do not separate the effect of control between different types of owners. We find no average effect of block size on the reorganization times. In Column (B), instead, we split between family and financial blockholding and, when comparing the effect between the two, we show that family ownership is associated with shorter reorganization times. This suggests that the concern for private benefits, which should be increasing in ownership stake, is higher for family owners as compared to financial owners, and this leads to lower time to reorganization.

In particular, given the block size, a one standard deviation higher family control is related to a 23% higher probability of exiting bankruptcy at each point in time, or 32% higher if compared to a one standard deviation higher financial control. The mean exit time in our sample is 446 days.

We provide a number of robustness checks. In particular, in Column (C), we cluster the standard errors at the SIC two-digit industry level. As we do not have information on all SIC industries, we lose some observations but the main effect remains robust. Column (D) limits the sample only to the successful outcomes while Column (E) limits the sample to the successful outcomes and non-prepackaged bankruptcy cases. In Column (F), we use 25% cut-off for effective control. In Column (G), we estimate the control using the weakest link principle. Our results are consistent across all these alternative specifications delivering results that are both qualitatively and quantitatively similar.

These findings support our first hypothesis that family blockholders try to reach a faster resolution of bankruptcy with creditors. Financial blockholders, on the other hand, might rather be relying on the option value to their equity stake that comes from a potential positive random shock to the firm value.

4. Gains of Lower Financial Distress

We now investigate our second set of hypothesis and look at whether bankruptcy proceedings turn out to be more advantageous to both creditors and minority shareholders in the case of bankruptcy of family firms. On the one hand, a greater effectiveness in handling bankruptcy procedures and the larger value of the firm due to lower deadweight costs would benefit all the parties involved and make both minority shareholders and lenders appreciate family block ownership. On the other hand, even if we observe a faster bankruptcy process, this might come at the expense of the creditors. For instance, by being close to the management, families might threaten to squander time and precious resources around bankruptcy. This would force creditors into reaching a faster bargaining outcome but with lower recovery rates for lenders and the minority shareholders.

4.1 Gains to creditors: Recovery rates

We start by linking credit recovery rates to the type of ownership. The recovery rates for the securities of filing firms are extracted from the Standard&Poors CreditPro database. The S&P CreditPro Recovery database provides credit loss information on defaulted bank loans and high yield bonds, as well as other debt instruments, for non-financial, non-real estate and non-insurance public and private US companies that have defaulted since 1987 and had US-issued debt of over 50 million dollars.

Recovery values are estimated by using either the value upon emergence from bankruptcy or the liquidation price. The value upon emergence from bankruptcy is either the trading price, or the market value of the pre-petition debt instruments or the new instruments a debt holder receives in exchange for the pre-bankruptcy instruments. The liquidation price is instead the final cash value of the new instruments that were acquired in exchange for the pre-bankruptcy instrument.

We have recovery data for Chapter 11 bankruptcies of 83 unique firms. We perform the analysis at the security level, following Acharya et al. (2007), and cluster the standard errors at the firm level. We include industry fixed effects defined at a two-digit SIC industry level as well as variables that control for

the type of debt – whether it is a loan or a bond issue – and whether the debt is secured and/or subordinated.

We first report the sample characteristics in Table 1, Panel C. We report the number of issuances per firm, mean maturity for its loan, mean issue size, average presence of the collateral (which for every instrument is defined as one if it is secured), as well as the standard deviation of these security characteristics. This latter variable measures the complexity of capital structure. We do not find that neither the number of issuances, nor the mean characteristics differ in the subsamples of family and financial block-held firms. Also, there is no evidence that complexity is different along any of the key dimensions: maturity, collateral, issue size.

Table 4 reports our main results. Column (A) reports the specification in which we do not separate the effect of control between the different types of owners. We find no average effect. However, if we split into two different types of control, in Column (B) we show that the control effect on recovery rates of firms held by financial blockholders is lower, as compared to the non-financial blockholders. Compared to a one standard deviation higher size of a controlling financial block, a one standard deviation higher size of the controlling family block is related to a 12% higher recovery rate for the lenders. This result is economically sizable since the average recovery rate in our sample is 48%. In other words, the results show that family blockownership is less negatively related to the recovery rates in the event of default than other forms of blockownership. While the financial blockownership is associated with a lower recovery rate in general, in the case of family blockownership such effect completely disappears!

This result is robust to the same set of robustness checks we described before. Column (C) excludes industry fixed effects. In Column (D), we estimate the control using the weakest link principle. In Column (E), we use 25% cut-off for effective control.

In line with our argument that family firms are good in negotiating, our results are strongest in the case in which the firm recovers after the settlement. In this case, the values are estimated using the market value of the pre-bankruptcy debt instruments or the new assets a debt holder receives in exchange for the

pre-bankruptcy instruments. We report the results for this subsample in Column (F). As expected, our results do not hold when the firm is liquidated. If the firm ceases to exist, the non-pecuniary benefits do not matter any longer.

It can be also argued that family firms might collateralize their debt better if they hold more tangible assets. To investigate this issue, we limit the sample to the cases in which debt does not have collateral. The results reported in Column (G) show that our findings survive. In fact, blockholding is irrelevant in the subsample where debt is collateralized, possibly because there is less scope for renegotiation. Similarly, in unreported results, we find no difference for the most senior class of debt. This suggests that our results are mostly driven by junior claims. The fact that senior claimants are not worse off while junior creditors are better off implies that the presence of family blockownership is not related to violations in the absolute priority rule. Finally, in unreported results we estimate a weighted least squares regression where we reweight each of the securities according to their share in the total principal amount of debt. This approach down-weights small issuances. We find consistent results.

Furthermore, one could argue that family firms have *ex ante* simpler debt structures that let them emerge faster and cheaper from bankruptcy. For instance, family blockholders might have closer relationships with the lenders and this could let their firms have more concentrated and simpler debt structures. Simpler debt structures would lead family firms to have more pre-packaged bankruptcies which are associated with lower complexity of debt structure (e.g., Tashjian et al., 1996; Goyal and Wang, 2016) and thus are expected to be resolved faster.

We first compare whether family firms indeed have simpler capital structures by reporting the comparison between family block-held and non-family block-held firms in Table 1, Panel D. We rely on the secondary market data of bonds that we further use in our analysis on *ex ante* borrowing costs. For each firm-year, we estimate standard deviations in security characteristics that should measure the complexity of capital structure. We look at the following characteristics of complexity: maturity, issue

size, whether the bond is enhanced, and whether the bond is non-senior. We only find difference in terms of the complexity of issue size which we do not believe affects our analysis.

We continue our analysis by looking at the bankruptcy cases for which we have recovery rates. As reported in Table 1, Panel C, we again find that the capital structure complexity is not different between two subsamples along any of the key dimensions: maturity, collateral, issue size.

Finally, we look at whether family firms differ in terms of the incidence of pre-packaged bankruptcies. This provides additional information on them having simpler debt structures. In Table 5, we report the results of probit regressions in which we look at whether the Chapter 11 bankruptcy filing was pre-packaged. We find that the family blockownership does not differ from financial blockownership in terms of recourse to pre-packaged bankruptcies. These results are robust and provide evidence that family firms did not find more convenient to file for pre-packaged bankruptcies. This suggests that they may not have had *ex ante* simpler debt structures.

4.2 Gains to minority shareholders: Stock market reaction to bankruptcy filings

We now proceed to test whether the other major stakeholders – minority investors – benefit from family's handling of bankruptcy. We focus on the stock market's *ex ante* expectation of the filing's success. We look at the secondary market stock price reaction after the bankruptcy filing. This represents the view of the minority shareholders and provides an indirect assessment of whether they benefit from family in handling bankruptcy. If the minority shareholders benefit more when blockholders are families, the stock prices should react less negatively to bankruptcy in the case of family firms.

Although the stocks are delisted from the stock exchanges after the bankruptcy filing, they continue to be traded on the over-the-counter (OTC) market. We therefore look at the stock price reaction in the OTC markets using Pink Sheets data. We test whether family blockownership explains the equity market reaction over the ten-day window around the announcement of filing for bankruptcy. We calculate the abnormal return of the firm's equity over the 10-day period around the bankruptcy filing by subtracting

the predicted returns from the actual returns on the stock. The predicted returns are based on the market model and beta is estimated over one year period before the start of the event window while the returns on the CRSP index are used as market returns. We cluster the standard errors at the firm's state level.

Table 6 reports the results. Column (A) reports the results of the specification in which we do not separate the effect of control between different types of owners. We find that the size of the control block is negatively associated with the equity returns around the bankruptcy announcement.

Column (B) reports the baseline specification in which we split between different types of control. We find that the negative effect of control stake is mostly present among financial blockholders. Indeed, when compared between the two, a one standard deviation larger family block commands 17% higher abnormal returns than a one standard deviation larger financial block, where the median abnormal returns are -53%. This effect can be attributed to different *ex ante* expectations of the ability of different types of blockholders in defining the success of the bankruptcy procedure. Given that minority shareholders are the residual claimants, this result shows that the minority shareholders trust family blockholders more to lead through the bankruptcy, as compared to other types of owners. In other words, family blockholders are expected to reduce bankruptcy costs by ensuring a faster resolution process. As we argue, such effect might come due to the family firm's concern for private benefits that lets firms reduce the general deadweight costs related to bankruptcy as there is a quicker resolution associated with bankruptcy (e.g., unproductive time spent by the CEO). Alternatively, given their willingness to preserve the firm and its name, families might also inject new equity capital during the bankruptcy proceedings. In both cases, the total pie available to all security holders is larger under the family control versus non-family control.

The results are consistent across different specifications. In Column (C), we do not include any firm-level controls. In Column (D), we use a specification in which we estimate the control using the weakest link principle. In Column (E), we use 25% cut-off for effective control. In Column (F), we estimate the abnormal returns over a three-day window around the bankruptcy filing.

These results also seem inconsistent with the families expropriating the minority shareholders. In such a case, there should be no beneficial role of the family and therefore no difference in the effect for the minority shareholders.

One important point is worth stressing. The fact that we do find that family control is associated with higher abnormal returns than financial control goes against the interpretation that the market assigns a lower probability that firms with a higher family blockholding file for bankruptcy because of their higher risk aversion and less risky corporate policies. That is, we do not find that the market is more negatively surprised when the information about the bankruptcy filings of firms with high family control is released.

4.3 Gains to blockholders: Post-bankruptcy ownership

So far, we have argued that families are more efficient in handling bankruptcy either because of the emotional attachment to the firm or because of monetary incentives. We can now look at whether, in addition to the non-pecuniary benefits, families are also able to preserve some monetary benefits. In line with the recontracting arguments of Franks and Torous (1989) and Bebchuk and Chang (1992), given that equityholders have partial control of the length of the negotiation process and the associated financial distress costs, they should be rewarded with larger stake than their *ex ante* contractual right would entail. In particular, higher *potential* distress costs and longer potential process should result in a higher ex post equityholders' share. The more they are able to reduce either the length of the negotiation process or the associated financial distress costs, the higher the stake they should be left with as part of the bargaining process.⁷ Therefore, given that families seem to be associated with lower bankruptcy costs, we would expect them to retain part of their ownership after the bankruptcy process ends.

We test this hypothesis by collecting data on post-bankruptcy ownership from SEC filings. We found 56 cases of emerged firms. We then estimated probit regressions in which the dependent variable takes

⁷ In addition, Broadie et al. (2007) have argued that in the first best the highest firm value is achieved with zero distress cost and partial debt forgiveness. Hart (2000) mentions that one of three goals of a good bankruptcy procedure is that some portion of value should be reserved to shareholders.

the value of one if the shareholder that was the majority blockholder before firm filed for bankruptcy retained any ownership in the firm after the firm emerged from bankruptcy and zero otherwise.

We report the results in Table 7. Column (A) reports the specification in which we do not separate the effect of control between different types of owners. Here, we find that larger initial control is associated with higher probability of retaining some ownership. In Column (B), we separately consider different types of control. We document that it is family ownership that is responsible for this effect. In particular, a one standard deviation larger family ownership is associated with a 31.2% higher likelihood of retaining any ownership. In other words, the bigger the stake, the higher the probability of control retention. This justifies higher the incentive to be more effective in managing bankruptcy. We find no similar relation in the case of financial blockownership. In Columns (C)-(E), we show that these results are largely robust across different specifications. In particular, in Column (C), we report the specification without any controls. In Column (D), we estimate the control using the weakest link principle, while in Column (E), we use 25% cut-off for the effective control. Except for the latter estimation, the results are consistently robust.

In Columns (F) and (G), we also investigate whether the size of the retained stake depends on the pre-bankruptcy stake of family and financial blockholders. We either use Orbis measures of family and financial blockholdings (Column F) or corresponding estimates from SEC filings (Column G) to estimate pre-bankruptcy ownership, and we find that the relationship between higher retained ownership post-bankruptcy and the initial block only holds for family blockholders.

One alternative explanation for these results could be that family blockholders are more willing to pour additional equity capital during the bankruptcy process. For instance, Donald Trump has put additional \$72m into the equity of Trump Hotels & Casino Resorts after it filed for bankruptcy in 2004. Before bankruptcy filing Trump had 56.29% class A and 100% class B shares. After the emergence, he was left with 30.8% of class A and kept all 100% of class B.

Although we are unable to identify whether family blockholders support their firms with equity more than financial blockholders do, even such explanation will be in line with our conjecture that families family block ownership is the preferred type of control during the bankruptcy process as they care more about the survival of the firm.

5. Ex Ante Effects on Firm Borrowing Costs

While the findings above provide the support for our hypothesis that family blockholders are more efficient in handling bankruptcy process, in our final step of analysis we want to look at whether these *ex post* benefits of lower costs of distress translate into the *ex ante* effects in the debt market. We now test whether the lenders are *ex ante* benefiting of family's handling of bankruptcy by providing lower borrowing costs. We consider *all* firms with publicly traded bonds, not conditioning on bankruptcy filings. We thus have 2631 firms with individual blockholders, 1537 firms with non-individual blockholders, and 1747 widely dispersed firms in this analysis.

More specifically, if family blockowners manage the bankruptcy process more efficiently and in a way that is beneficial to lenders, family firms should command lower borrowing costs before the bankruptcy. However, if lower costs of distress are outweighed by higher probability of bankruptcy, the creditors might be indifferent to families being blockholders in the distressed firms, or might even avoid them. In particular, higher private benefits might result in family firms valuing the control in the firm and thus avoiding equity financing and rather relying on debt to fund the expansion. Thus, higher private benefits might lead to higher debt levels and this could result in a higher probability of bankruptcy. So, while private benefits would reduce the cost of bankruptcy for creditors, they might increase the probability of bankruptcy⁸ with the net effect being uncertain.

⁸ The effect on the probability of distress is in fact uncertain. Alternatively, one could argue that family firms tend to take lower risk, mostly because their family owners are possibly undiversified so that they want to reduce firm specific risk. This means that, if anything, family firms should face lower financial distress. In this case, the family firms' cost of debt should be lower both because of lower cost of distress but also because of lower probability of distress.

Thus, in our tests we are interested in varying the private benefits component of family ownership, which would let us separate whether *ex ante* cost of debt is positively or negatively affected by the fact that families value the survival of the firm. To address this issue, we adopt an identification strategy that exploits staggered changes in inheritance, gift and estate taxes that apply to the residents of the firm's state of location in a particular year. We argue that inheritance taxes change the balance between monetary and non-pecuniary private benefits by making private benefits *relatively* more important if the monetary value is reduced. In particular, if the inheritance taxes that the firm's owners face rise, the private benefits become relatively more important compared to the monetary benefits of the firm, and thus the owners of the firm are more likely to care about the reputational concerns of the firm and care relatively less for their monetary wealth.

If we find that relatively more important private benefits increase the cost of debt, it is likely that the effect of reduced bankruptcy costs is outweighed by higher probability of bankruptcy that comes from higher leverage in order to preserve private benefits of control. Alternatively, if we find that increased relative importance of private benefits reduce the cost of debt, we can argue that lenders overall benefit from family blockholder presence due to their private benefits of control that reduce the cost of distress (or that probability of bankruptcy is also reduced by non-pecuniary benefits).

5.1 Identification strategy

We use an identification strategy based on the difference-in-difference estimates⁹ from the staggered implementation of changes in the legal environment at the state level (Bertrand and Mullainathan, 2003) to explore the causal relationship between firm's borrowing costs and private benefits.

Our identification strategy exploits the staggered changes of inheritance, gift, and estate taxes that apply to the residents of the firm's state of location in a particular year. We claim that if the value of the firm to the blockholder consists of monetary returns and non-pecuniary private benefits (e.g., Aghion and

⁹ The challenges of identifying the effect of ownership on corporate outcomes have been discussed in, for instance, Himmelberg et al. (1999) and Bennedsen and Nielsen (2010).

Bolton, 1992), the relative value of non-pecuniary benefits rises if the monetary value drops for the blockholder (a similar interpretation made in Hart, 2001). We look for the exogenous variations that would affect the monetary value of the block without affecting firm operations. Inheritance and estate taxes fit this requirement for family firms. By reducing the expected monetary returns to family blockholders, inheritance and estate taxes raise the relative value of non-pecuniary private benefits. Given that inheritance taxes change the balance between monetary and non-pecuniary benefits, this identification strategy should help us pin down the channel from which the effect comes from. If the inheritance taxes that the firm's owners face rise, the private benefits become relatively more important compared to the monetary benefits of the firm. This implies that the owners of the firm will care more about the reputational concerns of the firm and less about their monetary wealth.

We draw tax data from the annual editions of All State Tax Handbook¹⁰ and focus on estate tax, inheritance tax, generation skipping tax, and gift tax. Only two states introduced either of the taxes over our sample period – Vermont applied generation skipping tax starting in 2002 while in the same year Wisconsin introduced estate tax. However, many states abolished some of these taxes over our sample period, in line with the federal tax changes that came from Economic Growth and Tax Relief Reconciliation Act of 2001. Importantly to us, although many tax changes were concentrated around 2005, there is still variation across states in the timing of the changes.¹¹

We use this information to construct an index which is a sum of four dummies, each equal to one if the following state-wide taxes were applicable in a particular year: (a) estate tax, (b) inheritance tax, (c) generation skipping tax, (d) gift tax. Our index of inheritance taxes (ITI) thus ranges from 0 to 4. The ITI variable varies over time for most of the states (as reported in Panel A of Table 2) and across time (as reported in Panel B of Table 2).

¹⁰ We thank Jon Bakija for providing us with this data.

¹¹ Other than the presence of tax itself, tax levels could have also changed over the period. As we are not able to use the level of marginal estate tax rate since it depends on the family structure and type of assets, we resort to only using the count variable if such taxes are present, similarly to Heider and Ljungqvist (2015).

We provide the values as well as the distribution of firms by these values in Table 2. We start with providing ITI values at the start of our sample (year 2000), identify the years at which they change, and provide ITI values at the end of our sample (year 2010). Except the cases in which we explicitly indicate with (+), the other changes indicated in the table were related to the reduction of the index.

In our estimations, we interact our inheritance tax index with the share of family block ownership and treat it as our main variable of interest, while separately controlling for the levels of these two variables. In doing this, we follow Card (1992) who also uses a variable to classify cross-sectional units according to their exposure to the law change. In our case, this exposure variable is the share of family block ownership. In other words, we interact the inheritance tax index (with annual values reported in Table 2) with the blockholding variables. The effect of our interest is identified by the interaction of inheritance tax index with the family control, an essentially triple-difference estimate.

The important advantage of difference-in-differences approach is that we can control for omitted variables and absorb nationwide shocks or common trends that might affect the outcome of interest. We thus control for aggregate trends by including a full set of year dummies. Furthermore, we include firm fixed effects and a vector of time-varying controls. Specifically, we control for the logarithm of firm assets, firm leverage, profitability, and asset tangibility, to control for firm's financial constraints.

The regressions are estimated at the bond level and borrowing costs are based on the yield spreads in the secondary bond market. Each period, we use the bond of the issuer with the longest remaining maturity. This is chosen from the sample of bonds that have the yields reported in either TRACE (default source) or Bloomberg (used when data for a particular bond is unavailable from TRACE). We also control for bond-level characteristics such as logarithm of maturity, logarithm of issue size and a dummy indicating if the bond has any enhancements such as guarantees. The yield spreads are estimated as the difference between the yield on the bond and the yield on a Treasury bond of similar maturity. They are winsorized at 0.1% level. Since our tax change treatment is defined at the state level, we cluster the standard errors by state. We use annual data with the yield spreads estimated in December.

We rely on the assumption that family blockholders care about the inheritance taxes in the state of location of the firm that they control.¹² Although we do not observe the state of residence of the individual blockholders, we assume that it coincides with the state of location of the firm. Akin to home bias for investors, entrepreneurs are likely to found the firms in their state of residence and it is also known that bar from M&A and other corporate restructurings (after which blockholders lose significant stakes in any case) state of location for the firms do not change often over time (e.g., Pirinsky and Wang, 2006).

We also perform a robustness check where we replace the firm's current state of headquarters with the state that is mentioned the earliest in the headers of its 10-K filings, as provided by Bill McDonald. That is, we assume that even if the firm has moved, its individual owners are likely to have stayed in the original state where the firm was located. Only 7% of observations are affected in our case and our results are stronger in terms of statistical significance.

5.2 Results on borrowing costs

The results are reported in Tables 8-10. Column (A) of Table 8 reports the results of the specification in which we do not separate the effect of control between different types of owners. Column (B) reports the baseline specification where we split the control into family and financial blocks. Although the cost of debt is higher for blockheld firms (in line with similar findings by Davydenko and Strebulaev, 2007) and even higher for family firms, inheritance tax reduces the cost of borrowing for family firms as it shifts family owners to value private benefits more. With every additional value in inheritance tax index, a one standard deviation higher family control is related to 90bp lower returns compared to a one standard deviation higher financial control.¹³ This suggests that the private benefit component of family's involvement with the firm reduces its cost of debt, thus any potential increase in the probability of

¹² Even if they could evade inheritance taxes with the help of trusts, the presence of taxes makes them incur the costs of evasion that are often material.

¹³ Note that our results that inheritance taxes reduce costs of debt for family firms cannot be explained by Tsoutsoura (2015) who finds that inheritance taxes lead to a decline in investment around family successions, slow sales growth, and depletion of cash reserves.

bankruptcy that comes with higher debt in order to preserve private benefits is not dominated by the reduced costs of bankruptcy.

The results are robust. In Column (C), we estimate the control using the weakest link principle. In Column (D), we use 25% cut-off for effective control. In Column (E), we do not include any firm-level controls. In Column (F), we cluster the standard errors at the firm level. We continue with the robustness checks in Table 9. In Column (A), we control for state trends by adding state*year fixed effects. In Column (B), we instead control for industry trends by adding additional two digit SIC industry*year fixed effects. In Column (C), instead of the yield spread, the left hand side variable is the unadjusted yield on firm's bonds.

Different tax rates might occur at the same time. In particular, our results are not contaminated by corporate tax rate changes that affect debt levels (Heider and Ljungqvist, 2015). Although no state changed their corporate tax in the year they abolish or introduce inheritance tax, we additionally interact our control measures with the highest marginal corporate tax rate in the state.¹⁴ In addition, we interact our control measures with a dummy that takes value of one after 2006 to control for the effect of Tax Increase Prevention and Reconciliation Act of 2005. The findings (reported in Columns (D)-(E)) show that our results are consistent.

Then, we look into the cases in which we expect our effect to be strongest – i.e., the firms which associated with higher private benefits. We use several proxies to capture the potential heterogeneity of the effect. In particular, we split the sample according to firm size, firm age as well as “only game in town” measures as in Gompers et al. (2010).

We expect larger and older firms to have higher private benefits and also be more likely to face succession. We thus split the sample according to firm size and age in year 2001, at the start of our sample. Also, as suggested by Gompers et al. (2010) private benefits of control might be bigger when blockholders with the opportunity to be the major employer in their region. We estimate this measure of

¹⁴ The data on these tax rates comes from www.taxfoundation.org.

“only game in town” by calculating the number of Compustat firms in firm’s city, as well as estimating the proportion of firm’s sales over the sales of all Compustat firms in firm’s city in year 2000.

In Table 10, we report the results. They show that our effect is concentrated among larger firms (Columns A-B), older firms (Columns C-D), and firms that have few other firms in their city (Columns E-H).¹⁵ These results are consistent with our expectations and show that the bond market is aware of the reputational concerns of the families and uses them as a positive signal to assess the creditworthiness of the firm.

Finally, in Table 11, we directly test whether the probability of bankruptcy has indeed changed. We look at whether an increase in inheritance taxes and thus relatively higher importance of private benefits for family firms has affected firm covenant violations that increase the probability that the firm would face bankruptcy. We perform same specifications as in Table 8. We do not find that inheritance taxes affect covenant violation for family firms differentially than for non-family blockheld firms. This again suggests goes against the interpretation that the reduced cost of distress that comes from private benefits might be outweighed by increased probability of bankruptcy.

A non-result can be an outcome of two counterveiling forces. On one hand, as we argued, higher private benefits might mean that family firms value the control in the firm and thus try to avoid equity financing and rather rely on debt to fund the expansion. Thus, higher private benefits might lead to higher debt levels and this could result in a higher probability of bankruptcy. On the other hand, family firms tend to take lower operational risk, mostly because their family owners are undiversified. This means that, if anything, family firms should face lower financial distress. Possibly, these two effects offset each other.

Conclusions

We claim that the concerns for non-pecuniary private benefits reduce conflicts of interest between family blockholders and residual stakeholders – i.e., lenders and minority shareholders – around bankruptcy.

¹⁵ Unfortunately, we find very few cases where family and firm name overlap, so we are not able to test if our results are stronger in the cases where firm carries family name.

While in general blockownership is perceived negatively by the other stakeholders, the ability of family blockholders to effectively handle bankruptcy more than offsets their incentives to expropriate the other stakeholders.

We test this hypothesis focusing on the sample of public US corporations between 2001 and 2008. First, we study bankruptcy proceedings. Family firms emerge from bankruptcy faster and have higher recovery rates on debt, which is in line with debtholder interests of maximizing the proceeds from the reorganization process. This has direct implications for the other stakeholders. We find that family firms are associated with a smaller drop in stock price after the filing for bankruptcy. In exchange, families are more likely to retain some ownership after the firms emerge from bankruptcy.

Also, this translates into an ex-ante lower cost of borrowing for the firm. We identify this latter effect by adopting a difference-in-difference approach and exploiting legal changes in inheritance taxes across states. Some states changed their estate, inheritance, gift, or generation skipping taxes in our sample period, and we claim that family firms should have been primarily affected. Our results from these estimations provide evidence that emotional concerns in the debt market have *ex ante* positive effects for firm's debtholders.

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Appendix 1. Shapley-Shubik Index for Oceanic Game with Pyramidal Structures

Assuming that the control in the firm f is ensured with the holding of 50% of votes, Shapley-Shubik index for shareholder i in the firm f is given by:

$$\gamma_i = \sum_{S \subseteq T_i} \frac{t!(n-t-1)!}{n!}$$

where

T_i is a collection of all coalitions S for which $0.5 - w_i \leq w_S \leq 0.5 + w_i$

w_i is the ownership share in firm f by shareholder i

w_S is the combined S ownership share in firm f by coalition S

n is the number of all shareholders in the firm f

s is the number of shareholders in S set.

If $x = t + 1$ and $y = n - t$, substituting the values for t and n gives: $\gamma_i = \sum_{S \subseteq T_i} \frac{(x-1)!(y-1)!}{(x+y-1)!} = \sum_{S \subseteq T_i} B(x, y)$

This comes from the expression of beta function in terms of gamma functions, i.e. $B(x, y) = \frac{\Gamma(x)\Gamma(y)}{\Gamma(x+y)} = \frac{(x-1)!(y-1)!}{(x+y-1)!}$. Applying the definition of beta function, $B(x, y) = \int_0^1 u^{x-1} (1-u)^{y-1} du$, we get $\gamma_i = \sum_{S \subseteq T_i} \int_0^1 u^{x-1} (1-u)^{y-1} du = \sum_{S \subseteq T_i} \int_0^1 u^s (1-u)^{n-s-1} du$

A publicly traded firm often also has small atomic shareholders, also called ‘‘oceanic’’ shareholders, each of whom holds a negligible share and who together are not able to group to form a considerable influence on the formation of coalitions. Oceanic shareholders are assumed to provide random support for the coalitions. In such case the formation of coalitions is based on a smaller share of possible votes but winning coalitions also expect to be supported by some of the oceanic players. Assume that the combined share held by oceanic shareholders is equal to w_o and define M to be the set of ‘‘major’’, non-oceanic shareholders with the size m . Leech (1998) shows that when the number of oceanic shareholders goes to infinity in the limit γ_i becomes:

$$\gamma_i = \sum_{S \subseteq M} \int_b^a u^s (1-u)^{n-s-1} du$$

where

$$a = \max\left(\min\left(\frac{0.5 - w_S}{w_o}, 1\right), 0\right)$$

$$b = \max\left(\min\left(\frac{0.5 - (w_S + w_i)}{w_o}, 1\right), 0\right)$$

However, in the firms that are organized under the pyramidal structure and where some shareholders simultaneously own shares at different levels of the ownership structure, one has to take into account that such shareholders would vote consistently at each level of the ownership structure, i.e. their support for the coalition that finally controls firm f should not be considered independent at different levels of ownership.

In the pyramidal ownership cases the set of direct and indirect shareholders in the firm f , present at any of the ownership levels W can be deconstructed into three disjoint sets:

- O is the set of ‘‘oceanic’’ shareholders.

- $M = \{1, 2, \dots, m, \dots, \bar{m}\}$ is the set of “major” shareholders, present at any of the ownership levels, that themselves do not have any identifiable shareholders, belonging to sets M or K (e.g., individuals).
- $K = \{1, 2, \dots, k, \dots, \bar{k}\}$ is the set of “indirect” shareholders, present at any of the ownership levels, that themselves are directly owned by some shareholders M^k , and/or some other indirect shareholders K^k and/or some oceanic shareholders O^k .

The set of shareholders of k , present at any of the ownership levels of k , are M^{k*}, K^{k*}, O^{k*} with $M^k \subseteq M^{k*} \subseteq M, K^k \subseteq K^{k*} \subseteq K$ and $O^k \subseteq O^{k*} \subseteq O$. So, $W^k = M^k \cap K^k \cap O^k$ and $W^{k*} = M^{k*} \cap K^{k*} \cap O^{k*}$. As firm f is a member of $K, K = K^{f*}, M = M^{f*}, O = O^{f*}$.

For the limiting case where all oceanic shareholders are assumed to be dispersed, as their number goes to infinity, the Shapley-Shubik power index for shareholder i in firm k converges to:

$$\gamma_i^k = \begin{cases} \gamma_i^{j*} & \text{if } \exists j^* \in K^k \text{ s.t. } w_{j^*}^k > 0.5 \\ \int_{b^k}^{a^k} u^{\bar{s}^k} (1-u)^{\bar{m}^k - \bar{s}^k - 1} du & \text{otherwise} \end{cases} \quad (1)$$

where

$M_i = M - \{i\}$ while $M_i^{k*} = M_i \cap M^{k*}$

S are all subsets of M_i while $S_i^{k*} = S \cap M_i^{k*}$

\bar{m}^k and \bar{s}^k are the sizes of M_i^{k*} and S_i^{k*} , respectively

$$a^k = \max\left(\min\left(\frac{0.5 - w_S^k - \sum_{j \in K^k} w_j^k \gamma_S^j}{w_O^k}, 1\right), 0\right)$$

$$b^k = \max\left(\min\left(\frac{0.5 - (w_S^k + w_i^k) - \sum_{j \in K^k} w_j^k (\gamma_S^j + \gamma_i^j)}{w_O^k}, 1\right), 0\right)$$

w_O^k is the sum of direct ownership shares in firm k by all oceanic players in O^k

w_S^k is the sum of direct ownership shares in firm k by all shareholders in subset S

w_i^k is the sum of direct ownership share in firm k by shareholder i

w_j^k is the sum of direct ownership share in firm k by firm j

γ_i^j is the Shapley-Shubik index, estimated as in (1), in firm j by shareholder i

γ_S^j is the sum of Shapley-Shubik indices, estimated as in (1), by all shareholders in the subset S

Appendix 2. Family Controlled Firms in the Bankruptcy Sample

Company	Owner	Family Control
aaiPharma, Inc.	SANCILIO FREDERICK D. FAMILY	0.275834
Allied Holdings, Inc.	RUTLAND ROBERT J. FAMILY	0.139873
American Business Financial Services	SANTILLI ANTHONY J. AND BEVERLY	0.594642
ATA Holdings Corp.	MIKELSONS GEORGE J.	1
Chart Industries, Inc.	HOLMES CHARLES S. FAMILY	1
Circuit City Stores, Inc.	WATTLES MARK	0.103731
Delta Financial Corporation	MILLER HUGH MILLER LEE MILLER MARC E & HORAN WILLIAM J FAMILIES	0.342227
Energy Partners, Ltd.	BACHMANN RICHARD A.	0.262495
Fremont General Corporation	MCINTYRE JAMES A.	0.13443
InPhonic, Inc.	HOAG JAY C.	0.193622
Leap Wireless International, Inc.	RACHESKY MARK H.	0.557875
Liberate Technologies, Inc.	FEIST DANIEL L.	0.189908
Midway Airlines Corp	GOODNIGHT JAMES	0.719927
MPC Corporation	YEROS JOHN	0.5625
National Energy Group, Inc.	WARD TOM L.	1
Noble International, Ltd.	SKANDALARIS ROBERT J. FAMILY	0.235168
Oglebay Norton Company	WEIL JOHN D.	0.157421
Pegasus Satellite Communications, Inc.	PAGON MARSHALL W.	1
Pilgrim's Pride Corporation	PILGRIM LONNIE A	1
TOUSA, Inc.	KONSTANTINOS STENGOS	0.333333
Tribune Company	ROBERT R. MCCORMICK TRIBUNE FOUNDATION	0.129094
Trump Entertainment Resorts, Inc.	TRUMP DONALD J.	0.355014
Ultimate Electronics, Inc.	PEARSE WILLIAM J.	0.135638
VeraSun Energy Corporation	ENDRES DONALD L.	0.396286
WorldSpace, Inc.	SAMARA NOAH A.	1
York Research Corp.	BENINGSON ROBERT	0.408451
Young Broadcasting Inc.	YOUNG VINCENT J. FAMILY	0.411036

Appendix 3. List of Variables

Name of the Variable	Description	Source
Asset size	$=\ln(at)$	Bankruptcy filings, Compustat
Tangibility	$=1 - \text{intan}/at$	Bankruptcy filings, Compustat
ROA	$=\text{ebit}/at$, where at is lagged by a year.	Bankruptcy filings, Compustat
Leverage	$=(dlc+dltt)/(at-dlc-dltt)$	Bankruptcy filings, Compustat
% Debt cushion	Amount of debt contractually subordinated as a percentage of total debt. Contractual subordination is based on the ranking of bond/loan relative to all other instruments issued by the company	CreditPro
Collateral	Dummy, taking the value 1 if the bond/loan has any assets secured against it	Trace, Bloomberg, CreditPro
Issue size	Size of the face value of the bond/loan at the time of issue, normalized by the asset size of the issuing firm	Trace, Bloomberg, CreditPro
Maturity	Maturity in days until the expiration of bond/loan	Trace, Bloomberg, CreditPro
Yield spread Enhancement	Firm's yield spread over a Treasury bond of similar maturity Dummy variable set to 1 if the bond/loan has any enhancements (e.g., guarantees)	Trace, Bloomberg Trace, Bloomberg
% Control	Largest percentage of control by any owner in the firm	Orbis
% Family control	Largest percentage of control by any owner in the firm if the largest blockholder is an individual	Orbis
% Financial control	Largest percentage of control by any owner in the firm if the largest blockholder is not an individual	Orbis
Presence of large blockholder	Dummy, taking the value 1 if the firm has an that controls more than 10% of the firm	Orbis
Inheritance tax index (ITI)	An index (from 0 to 4) of a number of the following taxes that apply in the firm's state of location in the particular year: (a) estate tax, (b) inheritance tax, (c) generation skipping tax, (d) gift tax	All States Tax Handbook
Time to reorganization	Natural logarithm of time lapsed between the filing date for Chapter 11 and the confirmation of the reorganization plan	BankruptcyData.com /LoPucki database
Recovery rate	Weighted average of the fractions of defaulted bonds that were eventually recovered	BankruptcyData.com /LoPucki database
Equity return after bankruptcy filing	Abnormal return on the firm's equity in the 182 day period after the bankruptcy filing for Chapter 11, estimated by subtracting the CRSP market returns from the actual returns on the stock	Pink Quote

Table 1. Summary Statistics

This table presents summary statistics for the main variables used in the subsequent analysis. For these statistics we require non-missing information on firm size and equity ownership (a match between Compustat and Orbis). The summary statistics are reported at a firm or security level, averaged over time where appropriate.

Panel A. Variables in Bankruptcy Analysis

Variable	Source	Mean	Median	St. Dev.	N
Equity return after bankruptcy filing	PinkSheets	-0.172	-0.590	1.722	97
Recovery rate (security level)	S&P CreditPro	0.642	0.725	0.363	412
Time to reorganization (days)	BankruptcyData.com	458.194	345.0	414.239	124
Prepackaged bankruptcies	BankruptcyData.com	0.518	0	0.839	191

(Across firms with at least 10% blockholder at the time of bankruptcy, total number of firms=191)

Variable	Source	Mean	Median	St. Dev.	N
Average control as estimated by weakest link principle					
Across all firms	Orbis	0.303	0.236	0.209	125
Individual-owned firms	Orbis	0.341	0.283	0.232	28
Non-individual-owned firms	Orbis	0.292	0.213	0.202	97
Average control as estimated by Shapley-Shubik index					
Across all firms	Orbis	0.420	0.276	0.339	133
Individual-owned firms	Orbis	0.452	0.355	0.324	29
Non-individual-owned firms	Orbis	0.411	0.244	0.345	104

Panel B. Variables in Ex Ante Effects on Firm Borrowing Costs

Variable	Source	Mean	Median	St. Dev.	N
Asset size (\$m)	Compustat	4111.28	297.346	35349.6	5645
Tangibility	Compustat	0.874	0.950	0.165	5645
ROA	Compustat	-0.084	0.036	0.808	5633
Leverage	Compustat	0.333	0.231	0.321	5645
Issue size (\$m)	Bloomberg/TRACE	346.01	100	1572.1	24040
Maturity (years)	Bloomberg/TRACE	8.417	5.418	8.84	24040
Yield spread (bp)	Bloomberg/TRACE	346	181.9	581.3	24040

(Across firms with at least 10% blockholder, across all years)

Variable	Source	Mean	Median	St. Dev.	N
Average control as estimated by weakest link principle					
Across all firms	Orbis	0.294	0.206	0.206	3474
Individual-owned firms	Orbis	0.326	0.250	0.214	2207
Non-individual-owned firms	Orbis	0.243	0.160	0.185	1357
Average control as estimated by Shapley-Shubik index					
Across all firms	Orbis	0.398	0.222	0.339	3794
Individual-owned firms	Orbis	0.454	0.282	0.352	2361
Non-individual-owned firms	Orbis	0.311	0.165	0.298	1537

Panel C. Comparison between Two Subsamples at Time of Bankruptcy

(Bankruptcy dataset; across firms with at least 10% blockholder at the time of bankruptcy)

	Family firms	Financial block held firms	Difference	T-stat
ROA (%)	-1.08	-11.91	-10.83	0.5702
Leverage	0.24	0.28	-0.04	0.5816
Tangibility	0.15	0.19	-0.04	0.8037
Log assets	5.44	5.74	-0.29	0.4477

(Bankruptcy dataset; across firms with at least 10% blockholder at the time of bankruptcy)

	Family firms	Financial block held firms	Difference	T-stat
Time between earliest covenant violation and bankruptcy filing (days)	1166.19	1208.60	-42.41	0.245
Forum shopping for filing venue	0.59	0.78	-0.19	2.1333
Prepackaged bankruptcy	0.38	0.63	-0.25	1.3837
Time in bankruptcy (days)	333.72	475.71	-141.98	0.9939
Proportion of filings before 2003	0.17	0.57	-0.40	3.9997
Proportion of cases where firm is reorganized	0.64	0.75	-0.21	0.8078
Proportion of cases where firm is liquidated	0.36	0.20	0.17	1.2213
Proportion of cases where firm is acquired	0	0.05	-0.49	0.7437

(Recovery dataset; across firms with at least 10% blockholder at the time of bankruptcy)

	Family firms	Financial block held firms	Difference	T-stat
Number of issues	6.11	5.31	0.80	0.6085
Mean maturity (months)	69.53	56.51	13.02	0.9199
Standard deviation of maturity	46.86	35.37	11.49	0.824
Mean issue size (thousand \$)	122868.8	157720	34851.25	0.7749
Standard deviation of issue size	89420.3	100126.9	10724.61	0.4321
Mean presence of collateral	0.48	0.42	0.05	0.557
Standard deviation of the presence of collateral	0.33	0.45	0.12	1.4308

Panel D. Complexity of Capital Structures

(Undefaulted bonds dataset; across firms with at least 10% blockholder)

	Family firms	Financial block held firms	Difference	T-stat
Standard deviation of maturity (months)	70.24	73.38	-3.14	0.8626
Standard deviation of issue size (thousand \$)	138894.2	161105.8	-22211.55	1.8205
Standard deviation of non-senior bonds	0.12	0.13	-0.01	0.4454
Standard deviation of the presence of enhancement	0.13	0.12	0.01	0.6471

Table 2. Inheritance and Estate Taxes

Panel A of this table presents the values of the inheritance tax index (ITI) for each state and indicates the years when changes occurred. Panel B presents the distribution of observations according to ITI and year.

Panel A. State Values

State	ITI in 2000	Changes in ITI	ITI in 2010	State	ITI in 2000	Changes in ITI	ITI in 2010
Alabama	1	2005	0	Montana	3	2001, 2005, 2005	0
Alaska	2	2005, 2005	0	Nebraska	3	2007	2
Arizona	2	2005, 2005	0	Nevada	2	2005, 2005	0
Arkansas	1	2005	0	New Hampshire	2	2003, 2005	0
California	2	2005, 2005	0	New Jersey	2		2
Colorado	2	2005, 2005	0	New Mexico	1	2005	0
Connecticut	4	2008, 2005, 2005	1	New York	3	2000	2
Delaware	1	2005	0	North Carolina	3	2005, 2009	1
DC	1		1	North Dakota	1	2005	0
Florida	2	2005, 2005	0	Ohio	2	2005	1
Georgia	1	2005	0	Oklahoma	1	2010	0
Hawaii	2	2005, 2005	0	Oregon	1		0
Idaho	2	2005, 2005	0	Pennsylvania	2	2005	1
Illinois	2	2005	1	Rhode Island	2	2005	1
Indiana	3	2005, 2005	1	South Carolina	2	2005, 2005	0
Iowa	3	2005, 2005	1	South Dakota	2	2001, 2005	0
Kansas	2		2	Tennessee	4	2005, 2005	2
Kentucky	2	2005	2	Texas	2	2005, 2005	0
Louisiana	3	2004, 2005, 2008	0	Utah	1	2005	0
Maine	1	2010	0	Vermont	1	2002(+)	2
Maryland	3	2005	2	Virginia	2	2007, 2005	0
Massachusetts	2	2005	1	Washington	2		2
Michigan	2	2005, 2005	0	West Virginia	1	2005	0
Minnesota	1		1	Wisconsin	0	2002(+)	1
Mississippi	1	2005	0	Wyoming	1	2005	0
Missouri	2	2005, 2005	0				

Panel B. Distribution of Observations

ITI/Year	2001	2002	2003	2004	2005	2006	2007	2008	Total
0	14	17	0	0	0	0	467	429	927
1	98	103	122	140	120	147	358	331	1419
2	484	624	677	764	643	825	261	247	4525
3	137	67	73	78	60	70	6	5	496
4	35	36	44	53	40	58	0	0	266
Total	768	847	916	1035	863	1100	1092	1012	7633

Table 3. Time of Reorganization

We report estimates from semi-parametric (Cox proportional hazards) regressions where the dependent variable is the time elapsed between the filing date for Chapter 11 and the confirmation of the reorganization plan as provided in the datasets of BankruptcyData.com or UCLA-LoPucki BRD databases while the estimates are expressed as the hazard ratios. The estimates are provided using single-record per subject estimation.

Data from 2001 to 2008 is used for the estimation. All firms that filed for either Chapter 11 bankruptcy protection (as given by BankruptcyData.com or UCLA-LoPucki BRD databases) and could be matched to the ownership data in Bureau van Dijk databases are considered for the analysis. We use heteroskedasticity robust standard errors.

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. In Column (C) we cluster standard errors at the two digit industry level. Column (D) limits the sample to successful outcomes. Column (E) limits the sample to successful outcomes and non-prepackaged bankruptcy cases. In Column (F) we use 25% cut-off for effective control. In Column (G) we estimate the control using the weakest link principle.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
% Control	0.071 0.171						
% Family control		0.812*	1.132**	1.166*	1.335***	-0.066	1.766**
		1.800	2.574	1.908	2.596	-0.107	2.128
% Financial control		-0.036	0.286	0.052	0.617	-0.862	0.248
		-0.082	0.618	0.113	1.184	-1.426	0.297
Presence of large blockholder	0.114 0.492	0.116 0.502	0.101 0.347	0.179 0.636	0.384 1.227	-0.790* -1.946	0.281 1.020
ROA	0.002*** 5.217	0.002*** 5.01	-0.054*** -9.604	0.002*** 4.917	-0.072*** -4.293	0.002*** 4.686	0.002*** 4.861
Leverage	1.170*** 3.614	1.147*** 3.527	0.984*** 2.964	0.788** 2.465	0.236 0.479	1.308*** 3.824	1.220*** 3.707
Tangibility	-0.35 -1.373	-0.395 -1.526	-0.459 -1.404	-0.375 -1.098	-0.741 -1.434	-0.434* -1.721	-0.38 -1.444
Asset size	-0.041 -0.931	-0.036 -0.803	0.013 0.31	-0.006 -0.119	-0.022 -0.306	-0.044 -1	-0.039 -0.912
Prepack	1.033*** 7.607	1.055*** 7.902	1.269*** 8.088	0.989*** 6.583		1.058*** 8.082	0 .
Pseudo R2	0.071	0.073	0.095	0.069	0.027	0.077	0.075
N	124	124	94	96	60	124	124
% Family control - % Financial control		0.848*	0.846	1.114*	0.718	0.796*	1.518*

* p<0.10, ** p<0.05, *** p<0.01

Table 4. Recovery Rates

We report estimates from security-level regressions where the dependent variable is the fraction (multiplied by a 1000) of a defaulted bond/loan that was eventually recovered, as provided in S&P CreditPro database. Data from 2001 to 2008 is used for the estimation. Recovery values are estimated by the value upon emergence of bankruptcy (either the trading price, market value of the pre-petition debt instruments or the new instruments a debt holder receives in exchange for the pre-petition instruments) or the liquidation price (the final cash value of the new instruments that were acquired in exchange for the pre-petition instrument).

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. Column (C) excludes industry fixed effects. In Column (D) we estimate the control using the weakest link principle. In Column (E) we use 25% cut-off for effective control. In Column (F) we only focus on the cases where the recovery value of the debt was reached by settlement (market value of the pre-petition debt instruments or the new instruments a debt holder receives in exchange for the pre-petition instruments). In Column (G) we show the cases of debt without collateral.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
% Control	-0.187						
	-1.558						
% Family control		0.143	-0.114	0.214	0.415	0.282*	0.298
		0.852	-0.858	0.734	1.65	1.962	1.352
% Financial control		-0.242**	-0.286***	-0.263	-0.087	-0.271	-0.363**
		-2.093	-2.684	-1.552	-0.509	-1.644	-2.372
Presence of large blockholder	0.001	0.017	-0.038	0.026	0.161	-0.025	-0.005
	0.01	0.138	-0.38	0.21	1.126	-0.232	-0.029
Collateral	0.168**	0.156**	0.1	0.164**	0.175**	0.355***	
	2.162	2.027	1.243	2.14	2.247	4.484	
% Debt cushion	0.309**	0.329**	0.323***	0.318**	0.318**	0.102	0.394
	2.394	2.591	2.977	2.532	2.479	0.787	1.602
Maturity	0	0	-0.000**	0	-0.000*	-0.000**	-0.000*
	-0.675	-1.555	-2.033	-1.348	-1.95	-2.161	-1.973
Issue size	0.016	0.021	-0.019	0.02	0.018	0.005	0.031
	0.799	1.045	-0.742	1.012	0.909	0.207	1.173
Constant	0.376	0.238	1.016**	0.246	0.153	-0.008	0.075
	1.018	0.631	2.01	0.651	0.392	-0.014	0.139
Adjusted R2	0.352	0.368	0.190	0.359	0.380	0.457	0.383
N	412	412	412	412	412	295	283
% Family control - % Financial control		0.385**	0.172	0.477	0.502***	0.553***	0.661***
		4.913	2.286	2.764	8.466	9.282	7.559

* p<0.10, ** p<0.05, *** p<0.01

Table 5. Pre-packaged Bankruptcies

We report the estimates of the firm-level regressions where the dependent variable is a dummy, taking a value of 1 if the bankruptcy was pre-packaged, and 0 otherwise. Data from 2001 to 2008 is used for the estimation. All firms that filed for Chapter 11 bankruptcy protection (as given by BankruptcyData.com or UCLA-LoPucki BRD databases) and could be matched to the ownership data in Bureau van Dijk databases are considered in the analysis. Regressions include year fixed effects, unreported for brevity. We cluster standard errors at the firm's state level.

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. We do not include any firm-level controls in Column (C). Column (D) uses we estimate the control using the weakest link principle. In Column (E) we use 25% cut-off for effective control.

	(A)	(B)	(C)	(D)	(E)
% Control	0.085				
	0.793				
% Family control		0.045	0.045	0.16	-0.09
		0.187	0.188	0.536	-0.299
% Financial control		0.093	0.09	0.167	-0.055
		0.823	0.809	0.944	-0.314
Presence of large blockholder	-0.119	-0.119	-0.129	-0.081	-0.215
	-1.074	-1.074	-1.152	-0.796	-1.486
ROA	-0.000**	-0.000*		-0.001**	-0.001**
	-1.988	-1.899		-2.025	-2.242
Leverage	0.059	0.058		0.05	0.067
	0.404	0.401		0.341	0.457
Tangibility	0.348*	0.350*		0.350*	0.372*
	1.809	1.849		1.809	1.89
Asset size	-0.032*	-0.032*		-0.031*	-0.034*
	-1.816	-1.842		-1.707	-1.928
Pseudo R2	0.133	0.133	0.100	0.129	0.136
N	150	150	150	150	150
% Family control - % Financial control		-0.149	-0.135	-0.022	-0.105
		0.04	0.03	0.00	0.02

* p<0.10, ** p<0.05, *** p<0.01

Table 6. Equity Return after Bankruptcy Filing

We report the estimates of the firm-level regressions of the daily returns on the equity of the firm as traded on the Pink Sheets. Data from 2001 to 2008 is used for the estimation. All firms that filed for either Chapter 11 or Chapter 7 bankruptcy protection (as given by BankruptcyData.com or UCLA-LoPucki BRD databases), had their stock traded on Pink Sheets and could be matched to the ownership data in Bureau van Dijk databases are considered for the analysis. Abnormal return on the firm's equity is estimated over a 10 day period around the bankruptcy filing, calculated by subtracting the predicted returns from the actual returns on the stock. Predicted returns are based on the market model where beta is estimated over a one year period before the start of the event window while returns on CRSP index are used as market returns. Regressions include year fixed effects, unreported for brevity. We cluster standard errors at the firm's state level.

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. We do not include any firm-level controls in Column (C). In Column (D) we estimate the control using the weakest link principle. In Column (E) we use 25% cut-off for effective control. In Column (F) we estimate the abnormal returns over a three day window around bankruptcy filing.

	(A)	(B)	(C)	(D)	(E)	(F)
% Control	-0.920*					
	-2.023					
% Family control		-0.333	-0.33	-0.235	-0.545	0.004
		-0.62	-0.664	-0.341	-1.154	0.027
% Financial control		-1.269***	-1.252***	-1.588**	-1.496**	-0.234**
		-2.777	-2.845	-2.664	-2.404	-2.316
Presence of large blockholder	-0.888***	-0.864***	-0.874***	-0.703***	-0.631	-0.256***
	-3.09	-2.977	-2.864	-2.778	-1.306	-3.059
Chapter 11 filing	-1.993***	-2.088***	-2.051***	-2.052***	-2.152**	-0.149
	-2.812	-2.937	-2.877	-2.797	-2.701	-1.439
ROA	0.004	0.003		0.003	0.002	0.001
	1.283	0.79		0.625	0.542	1.141
Leverage	-0.139	-0.135		-0.092	-0.085	-0.064
	-0.69	-0.642		-0.414	-0.356	-1.155
Tangibility	0.15	0.301		0.316	0.627	0.033
	0.135	0.266		0.271	0.543	0.228
Asset size	0.053	0.058		0.061	0.065*	-0.028**
	1.566	1.643		1.677	1.743	-2.13
Constant	-0.056	-0.09	-0.088	-0.25	-0.328	-0.035
	-0.191	-0.304	-0.288	-0.967	-0.675	-0.228
Adjusted R2	0.206	0.211	0.065	0.187	0.189	0.063
N	97	97	97	97	97	129
% Family control - % Financial control		0.936*	0.922**	1.353	0.951**	0.238*
		3.335	4.256	2.63	5.102	3.121

* p<0.10, ** p<0.05, *** p<0.01

Table 7. Post Bankruptcy Ownership

We report marginal effects of the firm-level probit regressions where the dependent variable is a dummy, taking value of 1 if the shareholder that was the majority blockholder before firm filed for bankruptcy retained any ownership in the firm after the firm emerged from the bankruptcy. Data from 2001 to 2008 is used for the estimation. All firms that filed for either Chapter 11 bankruptcy protection (as given by BankruptcyData.com or UCLA-LoPucki BRD databases) and could be matched to the ownership data in Bureau van Dijk databases and for which SEC filings were available after the emergence from bankruptcy are considered for the analysis. We cluster standard errors at the firm's state level.

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. We do not include any firm-level controls in Column (C). Column (D) uses we estimate the control using the weakest link principle. In Column (E) we use 25% cut-off for effective control.

Columns (F) and (G) report OLS regressions where the dependent variable is the control fraction retained by the pre-bankruptcy majority blockholder after emergence from bankruptcy. Column (F) uses Orbis data for control, while Column (G) uses the data from the company SEC filings prior to and post bankruptcy.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
% Control	0.370**						
	2.293						
% Family control		0.887***	1.170**	1.302**	1.075	0.189**	0.238*
		2.603	2.501	2.562	1.574	2.212	1.906
% Financial control		0.243	0.247	0.293	0.327	-0.019	0.039
		1.297	0.984	1.140	0.924	-0.439	0.506
Presence of large blockholder	0.239	0.249	0.167	0.200	0.214		0.001
	1.441	1.356	0.784	1.13	0.827		0.026
ROA	0.204**	0.236**		0.240**	0.241**	0.006*	0.006*
	2.239	2.563		2.468	2.459	1.800	1.911
Leverage	0.012	-0.012		-0.048	-0.019	0.029	0.023
	0.081	-0.094		-0.294	-0.123	0.654	0.531
Tangibility	0.142	0.093		0.132	0.122	0.108	0.094
	0.796	0.604		0.771	0.728	1.641	1.526
Asset size	-0.034	-0.024		-0.024	-0.028	-0.013**	-0.013**
	-1.613	-1.165		-1.166	-1.378	-2.667	-2.674
Pseudo R2/Adjusted R2	0.238	0.301	0.157	0.294	0.288	0.215	0.238
N	56	56	56	56	56	59	62
% Family control - % Financial control		3.038**	2.847**	4.44**	3.351**	0.208**	0.199*
		3.98	5.39	4.10	4.77	7.53	3.022

Table 8. Ex-ante Effects on Secondary Market Yields

We report the estimates of the firm-level regressions of yield spreads. Annual data from 2001 to 2008 is used. Issuer's bond with the longest remaining maturity is used in the analysis in each period, chosen from the sample of bonds that have the yields reported in either Trace (default source) or Bloomberg (used when data for a particular bond is unavailable from Trace). The yield spreads are winsorized at 0.1% level. Standard errors are clustered at the state level.

The main variables of interest are the interactions of the largest control stake in the firm with the inheritance tax index (ITI). Inheritance tax index ranges from 0 to 4 and indicates a number of the following taxes that apply in the firm's state of location in the particular year: (a) estate tax, (b) inheritance tax, (c) generation skipping tax, (d) gift tax. Index values are reported in Table 2.

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. In Column (C) we estimate the control using the weakest link principle. In Column (D) we use 25% cut-off for effective control. We do not include any firm-level controls in Column (E). In Column (F) we cluster standard errors at the firm level.

	(A)	(B)	(C)	(D)	(E)	(F)
% Control* ITI	-0.615					
	-0.842					
Presence of large blockholder * ITI	0.709*					
	1.84					
% Family control* ITI		-2.370***	-3.701***	-2.182***	-2.465***	-2.370**
		-3.539	-3.166	-3.105	-3.695	-2.381
% Financial control* ITI		-0.797	-1.657*	-0.18	-0.7	-0.797
		-1.247	-1.75	-0.35	-1.032	-1.183
% Control	-2.410					
	-0.793					
% Family control		1.653	2.155	-11.451	1.718	1.653
		0.509	0.454	-0.981	0.521	0.483
% Financial control		-1.934	-2.514	-15.919	-2.015	-1.934
		-0.684	-0.688	-1.421	-0.703	-0.642
Presence of large blockholder	-4.008	-2.808	-3.041**	-14.133	-2.736	-2.808
	-1.549	-1.107	-2.119	-1.389	-1.062	-1.087
Inheritance tax index (ITI)	-0.36	0.104	0.15	-0.002	0.044	0.104
	-0.925	0.367	0.525	-0.007	0.157	0.344
ROA	-11.125***	-11.192***	-11.164***	-11.193***		-11.192***
	-3.966	-4.096	-4.067	-4.134		-4.327
Leverage	0.312	0.324	0.316	0.325		0.324
	1.634	1.67	1.648	1.67		1.526
Tangibility	-0.174	-0.157	-0.146	-0.083		-0.157
	-0.121	-0.112	-0.105	-0.061		-0.084
Asset size	0.094	0.106	0.114	0.077		0.106
	0.273	0.311	0.331	0.231		0.234
Enhancement	0.181	0.174	0.177	0.194		0.174
	0.502	0.497	0.502	0.556		0.412
Maturity	-0.612***	-0.629***	-0.628***	-0.633***		-0.629***
	-3.092	-3.164	-3.174	-3.212		-2.806
Issue size	-0.316**	-0.317**	-0.319**	-0.317**		-0.317**
	-2.593	-2.598	-2.629	-2.592		-2.118
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	7633	7633	7633	7633	7633	7633
% Family control* ITI - % Financial control* ITI		-1.574**	-2.043*	-2.001**	-1.766**	-1.574
		4.346	2.932	6.929	5.38	2.212

* p<0.10, ** p<0.05, *** p<0.01

Table 9. Additional Robustness Checks for Ex-ante Effects on Secondary Market Yields

We report the estimates of the firm-level regressions of yield spreads. Annual data from 2001 to 2008 is used. Issuer's bond with the longest remaining maturity is used in the analysis in each period, chosen from the sample of bonds that have the yields reported in either Trace (default source) or Bloomberg (used when data for a particular bond is unavailable from Trace). The yield spreads are winsorized at 0.1% level. Standard errors are clustered at the state level. All regressions include controls as in Table 8, Column (B).

The main variables of interest are the interactions of the largest control stake in the firm with the inheritance tax index. Inheritance tax index ranges from 0 to 4 and indicates a number of the following taxes that apply in the firm's state of location in the particular year: (a) estate tax, (b) inheritance tax, (c) generation skipping tax, (d) gift tax. Index values are reported in Table 2.

Column (A) replicates the specification in Table 8, Column B, but with additional state*year fixed effects. Column (B) includes additional industry*year fixed effects instead. In Column (C), instead of the yield spread, the left hand side variable is the unadjusted yield on firm's bonds. Column (D) adds additional interactions of % Family control with higher marginal corporate tax rate in the state while Column (E) adds additional interactions of % Family control with post year 2006 dummy.

	(A)	(B)	(C)	(D)	(E)
% Family control* ITI	-2.258***	-1.629**	-2.164***	-2.396***	-2.540***
	-2.753	-2.030	-3.584	-3.491	-3.879
% Financial control* ITI	-0.72	-0.467	-0.525	-0.75	-1.217**
	-1.026	-0.600	-0.858	-1.152	-2.043
% Family control	1.853	0.580	1.384	2.273	2.196
	0.483	0.187	0.457	0.671	0.712
% Financial control	-1.82	-2.614	-2.166	0.643	-0.709
	-0.568	-1.020	-0.800	0.203	-0.238
Presence of large blockholder	-2.32	-3.486	-2.657	-2.566	-2.778
	-0.888	-1.412	-1.007	-0.982	-1.098
Inheritance tax index (ITI)		0.06	0.127	0.112	0.159
		0.195	0.423	0.397	0.573
Corp. Tax				0.091	
				0.954	
% Family control* Corp. Tax				-0.119	
				-0.443	
% Financial control* Corp. Tax				-0.454*	
				-1.81	
Post-2006					6.402***
					12.824
% Family control* Post-2006					-0.361
					-0.349
% Financial control* Post-2006					-1.180*
					-1.862
Controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
N	7633	7633	7633	7633	7633
% Family control* ITI -					
% Financial control* ITI	-1.538*	-1.162	-1.64**	-1.646**	-1.323*
	3.394	1.76	4.987	4.44	3.664

Table 10. Heterogeneity of Ex-ante Effects on Secondary Market Yields

We report the estimates of the firm-level regressions of yield spreads. Annual data from 2001 to 2008 is used. Issuer's bond with the longest remaining maturity is used in the analysis in each period, chosen from the sample of bonds that have the yields reported in either Trace (default source) or Bloomberg (used when data for a particular bond is unavailable from Trace). The yield spreads are winsorized at 0.1% level. Standard errors are clustered at the state level. All regressions replicate specification in Table 8, Column (B).

The main variables of interest are the interactions of the largest control stake in the firm with the inheritance tax index. Inheritance tax index ranges from 0 to 4 and indicates a number of the following taxes that apply in the firm's state of location in the particular year: (a) estate tax, (b) inheritance tax, (c) generation skipping tax, (d) gift tax. Index values are reported in Table 2.

Columns (A)-(B) split the sample for firms above (Column A) and below (Column B) median size in year 2001. Columns (C)-(D) split the sample for firms older (Column C) and younger (Column D) median age in year 2001. Columns (E)-(F) split the sample for firms above (Column E) and below (Column F) the inverse of the median number of public firms in its city in year 2000. Columns (G)-(H) split the sample for firms above (Column G) and below (Column H) median fraction of sales that firm has among all public firms in its city in year 2000.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
% Family control* ITI	-2.756**	-0.976	-4.782**	-0.642	-3.237***	-0.617	-3.965***	-0.858
	-2.524	-1.001	-2.073	-0.728	-3.025	-0.297	-2.975	-0.585
% Financial control* ITI	-1.489*	-0.574	-2.586**	-0.388	-0.666	-0.539	-0.852	-0.44
	-1.853	-1.422	-2.238	-0.614	-1.1	-0.533	-1.096	-0.376
% Family control	5.235	2.438	8.675	2.048	7.793***	-9.711*	8.887***	-9.607*
	1.215	0.882	1.618	0.745	3.189	-1.827	3.161	-1.943
% Financial control	4.465	2.278*	3.602*	2.688	1.703	-9.926**	1.646	-10.273***
	1.212	1.891	1.743	0.969	0.705	-2.182	0.702	-2.897
Presence of large blockholder	4.164	-0.606	5.338**	0.255	0.362	-7.325*	0.890	-7.104*
	0.908	-0.457	2.147	0.102	0.119	-1.828	0.270	-2.001
Inheritance tax index (ITI)	0.001	0.553	0.165	0.170	0.160	-0.170	0.578	-0.246
	0.002	1.106	0.848	0.295	0.358	-0.447	1.473	-0.720
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2361	2372	1896	2837	4300	3132	2892	4506
% Family control* ITI - % Financial control* ITI	-1.267	-0.402	-2.195	-0.254	-2.572**	-0.078	-3.113**	-0.418
	1.065	0.18	0.734	0.109	5.79	0.001	5.189	0.064

Table 11. Covenant Violations

We report the estimates of the firm-level regressions of covenant violations. Annual data from 2001 to 2008 is used. Standard errors are clustered at the state level.

The main variables of interest are the interactions of the largest control stake in the firm with the inheritance tax index (ITI). Inheritance tax index ranges from 0 to 4 and indicates a number of the following taxes that apply in the firm's state of location in the particular year: (a) estate tax, (b) inheritance tax, (c) generation skipping tax, (d) gift tax. Index values are reported in Table 2.

Column (A) reports the specification where we do not separate the effect of control between different types of owners. The control is estimated based on Shapley-Shubik index as described in Appendix 1, using a 10% cut-off. Column (B) reports the baseline specification. Family control is defined if the largest percentage control holder in the firm is an individual. Financial control is defined if the largest percentage control holder in the firm is not an individual. In Column (C) we estimate the control using the weakest link principle. In Column (D) we use 25% cut-off for effective control. We do not include any firm-level controls in Column (E). In Column (F) we cluster standard errors at the firm level.

	(A)	(B)	(C)	(D)	(E)	(F)
% Control* ITI	-0.014					
	-0.710					
Presence of large blockholder * ITI	0.005					
	0.564					
% Family control* ITI		-0.04	-0.042	-0.039	-0.047	-0.040
		-1.257	-1.119	-1.112	-1.227	-1.014
% Financial control* ITI		-0.007	-0.017	0.005	-0.008	-0.007
		-0.388	-0.583	0.319	-0.447	-0.392
% Control	0.030					
	0.392					
% Family control		0.073	0.04	0.327	0.075	0.073
		0.661	0.178	1.469	0.624	0.683
% Financial control		0.023	0.02	0.273	0.026	0.023
		0.281	0.094	1.247	0.309	0.359
Presence of large blockholder	0.006	0.015	0.017	0.241	0.021	0.015
	0.058	0.151	0.150	1.134	0.206	0.192
Inheritance tax index (ITI)	-0.021**	-0.018**	-0.018*	-0.019**	-0.021**	-0.018*
	-2.045	-2.056	-1.985	-2.307	-2.416	-1.653
ROA	-0.455***	-0.454***	-0.455***	-0.454***		-0.454***
	-2.939	-2.962	-2.93	-2.942		-3.912
Leverage	0.014	0.014	0.014	0.014		0.014
	1.641	1.628	1.605	1.63		1.282
Tangibility	0.012	0.013	0.013	0.012		0.013
	0.138	0.148	0.15	0.142		0.184
Asset size	0.025	0.025	0.025	0.025		0.025
	1.35	1.351	1.349	1.351		1.323
Enhancement	0	0	0	-0.001		0
	0.005	-0.025	-0.017	-0.053		-0.028
Maturity	-0.005	-0.005	-0.005	-0.005		-0.005
	-0.567	-0.575	-0.566	-0.551		-0.679
Issue size	0.004	0.004	0.004	0.004		0.004
	0.693	0.701	0.692	0.702		0.734
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	5771	5771	5771	5771	5771	5771
% Family control* ITI - % Financial control* ITI		-0.034	-0.025	-0.044	-0.038	-0.034
		0.988	0.286	1.232	1.121	0.698

* p<0.10, ** p<0.05, *** p<0.01