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Disproportional Control Rights and the Governance Role of Debt

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We examine the governance role of debt in the context of U.S.-based dual class ownership structures. We hypothesize that the use of debt alleviates the conflict between shareholder classes by balancing the power of controlling insiders. We document that dual class firms have higher leverage and a greater propensity to issue private debt; they also more frequently use cash sweeps and performance-based covenants. Dual class firms with greater agency conflicts and a greater need to access the capital market appear to rely more extensively on debt. These findings are consistent with controlling insiders bonding against the agency costs associated with dual class ownership. The governance role of debt is further corroborated by the valuation effect of debt for dual class companies. Private debt issuances trigger greater positive market reactions to the inferior dual class stock in relation to both the superior dual class stock and a matched sample of single class firms. Further, leverage attenuates the previously documented adverse effect of dual class status on Tobin's q. Taken together, our analyses suggest that dual class firms use debt as a complementary governance mechanism.

Keywords: dual class; capital structure; private debt; debt covenants; bonding mechanisms
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1. Introduction

Dual class ownership has been subject to much controversy because it allows one class of shareholders (the "controlling insiders" or the "superior shareholders") to control a portion of votes that substantially exceed their cash flow rights. This superior class of shareholders commonly participates in firm management or exercises control rights over the management. The disparity between voting and cash flow rights creates a severe agency conflict among the superior and inferior (or minority) classes of shareholders that has been argued to adversely affect firm value (e.g., Bebchuk et al. 2000, Johnson et al. 2000). As such, dual class ownership is often viewed as an unconditionally poor governance structure. Nevertheless, a nontrivial fraction of public companies continue to adopt and maintain dual ownership structures, even in a market as competitive as is the United States.[1] One explanation for this practice is that dual class structures are in fact value enhancing in some settings; they alleviate the coordination problems inherent to widely held corporations and facilitate long-term (strategic) managerial decision making (see Burkart and Lee 2008, for discussion). Consistent with this view, incomplete contracts theory suggests that it can be optimal to separate control rights from cash flow rights (Aghion and Bolton 1992, Hart 2001). This can happen when gains from coordinating control in the hands of a few insiders outweigh the costs stemming from the conflict between shareholder classes. If such an explanation is true, the insiders in dual class firms are expected to use governance mechanisms to minimize the agency costs associated with dual class ownership. We hypothesize and find empirical evidence that debt serves as such a governance mechanism, which helps insiders to achieve this objective.

The agency conflict among the shareholder classes in dual class firms is related to the conflict between inside and outside equity in Jensen and Meckling (1976). They consider the case of a manager-shareholder

[1] The past few years have seen a wave of dual class offerings: since 2011, 14% of tech firms have had dual class shares compared to 6.4% of firms 10 years ago (McRitchie 2013). Recently, Google Inc. split its stock to create a new class of nonvoting capital stock. Although this move was controversial among shareholders, Google's founders defended the decision to maintain control by arguing that it would help them to "innovate without worrying about investors who are short-term profit seekers" (Efrati 2012).

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and a controlling insider who partially finances a firm's assets with nonvoting outside equity. After the shares are issued, the insider has incentives to pursue socially wasteful private consumption of the firm's resources because such consumption is subsidized by outside shareholders. Ultimately, however, the insider bears the cost of private consumption because outside investors either price protect when they purchase the shares or simply withhold financing. These possibilities provide insiders with incentives to bond against excessive consumption of private benefits. The traditional governance mechanisms that alleviate this conflict are corporate charters, the market for corporate control, independent boards of directors, incentive compensation, and the presence of outside block-holders. In dual class firms, however, these governance mechanisms have a limited ability to discipline insiders as a result of the high degree of control that accompanies superior voting rights, because (1) dual class firms are almost immune to the market for corporate control (e.g., Gilson 1987, Gompers et al. 2010); (2) superior voting rights allow insiders to elect the majority of the board members, thus compromising board independence (Amit and Villalonga 2009); (3) activist shareholders, such as institutional investors, tend to shy away from investing in dual class stocks (Li et al. 2008); and (4) dual class firms' CEOs exercise control over the design of their own incentive compensation contracts (Masulis et al. 2009). Unlike these mechanisms, the reliance on debt is a viable way of balancing the power of controlling insiders and alleviating the conflict between shareholder classes, as discussed further below.

How can debt benefit an outside or inferior class of shareholders? First, debt reduces insiders' incentives and opportunities to engage in private benefits consumption (e.g., empire building) because borrowed funds must be repaid (Jensen 1986). This should benefit shareholders as residual claimants under the assumption that "debtholders" break even in a competitive market. Second, debt serves as an alternative control mechanism. Unlike noncontrolling shareholders, debtholders can use the event of a default to seize control and influence decision making. For example, they could use their influence to replace the underperforming management. The prospect of a loss of control, in turn, provides the insiders (management) with incentives to focus on value maximization (e.g., Grossman and Hart 1982). Finally, debtholders provide active monitoring and exercise control rights even outside of default or financial distress (e.g., Triantis and Daniels 1995). In particular, debt grants state-contingent control rights; i.e., insiders can keep their control rights as long as they can continue to meet the performance requirements stated in the debt contracts. To the extent that the interests of debtholders and minority shareholders overlap when it comes to limiting private benefits consumption, liquidating suboptimal operations, replacing bad management, etc., debt is expected to be beneficial from the perspective of the outside shareholders.

The above benefits of debt suggest that insiders interested in minimizing the agency costs associated with dual class ownership should view it as a useful bonding device. Because the consumption of private benefits is not a productive activity, it is reasonable to assume that insiders, who ultimately internalize the agency costs, will have incentives to bond, at least on average. Perhaps the most direct way to achieve this is via the unification of the superior and inferior shareholder classes into a single class. However, this would be at odds with the assumption that a dual class ownership structure is chosen optimally because of the demand for concentrated control present in dual class firms. Therefore, we hypothesize that, compared to single class firms, insiders in dual class firms will choose higher levels of debt financing as a way of bonding against the agency costs of dual class ownership.

We further investigate the bonding hypothesis by examining more specific mechanisms through which debt fulfills its disciplinary role. First, we examine whether dual class firms are more likely to subject themselves to private debt, which can be viewed as a way to facilitate monitoring (Diamond 1984), provide access to internal information (Fama 1985), or to facilitate governance more generally (e.g., Baird and Rasmussen 2006). Second, we examine whether dual class firms are more likely to allocate control rights to creditors, facilitating their intervention with managerial actions via default provisions (e.g., Nini et al. 2012). As discussed earlier, the threat of a loss of control is instrumental in disciplining insiders who control the votes (e.g., Harris and Raviv 1990, Grossman and Hart 1982). Specifically, given that insiders might be prone to divert free cash flows for private purposes (Jensen 1986), we examine whether debt contracts of dual class firms are more likely to contain covenants limiting the use of cash ("cash sweeps") and hence implicitly restricting certain actions of controlling insiders (e.g., acquisitions). We also examine whether insiders in dual class firms subject themselves to creditor monitoring through accounting-based covenants that serve as trip wires triggering control transfers following underperformance.

The main challenge we face is that dual class ownership is an endogenous choice dictated by the need for greater control over a company (DeAngelo and DeAngelo 1985).[2] Specifically, both dual class

[2] DeAngelo and DeAngelo (1985) discuss the efficiency benefits of the disproportional control associated with dual class shares; such

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structure and the choice of debt may be driven by other factors that jointly determine the optimal capital structure. To alleviate this concern, we perform several types of tests, including propensity score matching (PSM), instrumental variable analysis, and cross-sectional tests within dual class firms. Our PSM research design pairs dual class and single class firms along a number of firm-specific dimensions that are likely to affect the outcome variable (e.g., the level of debt) and are correlated with the choice of dual class ownership. This method is also considered to be more robust to model misspecification relative to regression-based methods (Bharath et al. 2011, Armstrong et al. 2010b). Furthermore, we assess the extent to which "selection on unobservables" may confound the matching procedure by conducting the sensitivity analysis developed by Altonji et al. (2005). In our instrumental variable analyses, we use instruments identified in Gompers et al. (2010) and recognized in the literature (Bebchuk and Weisbach 2010). Finally, in our cross-sectional models we identify settings within dual class firms where insiders are more likely to bond (i.e., more severe agency conflicts, more growth opportunities, and a greater need for equity financing) and use firm-specific characteristics as partitioning variables (e.g., Rajan and Zingales 1998).

To further alleviate the endogeneity concern and improve our understanding of the governance role of debt in dual class firms, we perform three additional sets of analyses. First, we examine the market reactions to private debt issuances made by dual class firms. Second, we revisit the findings of Gompers et al. (2010) that agency costs in dual class companies are reflected in their valuations (Tobin's q), and investigate whether the negative relation between dual class ownership and Tobin's q is attenuated by leverage. Finally, we investigate how the use of debt affects the private benefits of control in dual class firms, as reflected in the voting premiums. Overall, the battery of tests demonstrates the robustness of our findings and mitigates the concern that the endogenous selection of dual class structures by firms may lead to a bias in our estimates.

Our results are as summarized as follows. First, we document that dual class firms have higher book and market value-based measures of leverage compared to single class firms. Our cross-sectional tests indicate that dual class firms have higher leverage when the benefits of bonding are greater. Specifically, higher leverage is observed in dual class firms with elevated agency costs, as evidenced in greater divergence between cash flow rights and voting rights. Further, higher leverage is observed in dual class firms with higher growth opportunities and a greater need to access equity markets (as evidenced in more frequent equity issuances). Second, the analysis of specific channels through which debt disciplines entrenched insiders reveals that (1) dual class firms are more likely to use private debt in their capital structure and there is some evidence that they are more likely to maintain lending relationships, (2) the debt contracts of dual class firms are more likely to limit managerial discretion over the inflows of cash, (3) dual class firms are more likely to rely on trip wire-type performance-based covenants. These results are consistent with our prediction that dual class firms are more likely to use debt and the associated monitoring and control mechanisms. These results are robust across different econometric methods.

In addition, we document that private debt issuances by dual class firms elicit significantly higher positive market reactions for the inferior class stock when compared with both the superior class stock in dual class firms and the stock in single class firms. We also document that the negative relation between dual class ownership and firm performance, Tobin's q, documented in Gompers et al. (2010) is attenuated and ultimately disappears as the level of debt increases. This is consistent with the argument that debt mitigates the agency costs associated with the separation of ownership and control. Finally, we find that voting premiums in dual class firms decrease with the level of debt, which is consistent with a reduction in private benefits consumption.

We contribute to the literature in three primary ways. First, we improve the understanding of the governance role of debt and its monitoring mechanisms. Baird and Rasmussen (2006) argue that debt is a missing lever of corporate governance that finance and legal studies have largely overlooked. Relatively few empirical studies address the governance role of debt (Harvey et al. 2004, Friedman et al. 2003, John and Litov 2010, and Nini et al. 2012), and none of these studies address a setting that involves dual class companies.[3] This is an important distinction of our study, given that the governance problem in these firms is not opportunism by managers at the expense of public shareholders, but opportunism by controlling shareholders at the expense of minority shareholders. Thus, the nature of the agency

benefits include avoiding uninformed outside stockholders' interference, protecting managers' investments in organization-specific investments, and protecting managerial perk consumption (which the authors view as an efficient arrangement between controlling and outside shareholders).

[3] Harvey et al. (2004) and Friedman et al. (2003) examine the governance role of debt in emerging markets and countries with weak governance systems. John and Litov (2010) study debt as a governance mechanism in single class firms, and Nini et al. (2012) study the active governance role of creditors in single class firms.

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problem is different and, arguably, more extreme (Bebchuk et al. 2000). In addition, we provide evidence on the governance role of a number of specific monitoring mechanisms in debt contracts, including private debt and accounting-based covenants. The latter also contributes to the accounting literature on the role of accounting in contracting by suggesting that accounting-based covenants not only address debtholder–shareholder conflicts but also play a broader governance role by alleviating the conflict between shareholder classes.

Second, to the best of our knowledge, our study is first to document that debt has a positive valuation effect for dual class companies. Our results extend those of Gompers et al. (2010), who document that dual class firms have a negative association with Tobin's q, holding leverage constant. We add to this evidence by documenting that the relation between the presence of dual class structures and Tobin's q is conditional on the level of debt.

Third, our study contributes to the recent policy debate on the desirability of dual class shares (Nishiwaza and Frost 2014). We provide empirical evidence that some companies adopting dual class ownership employ mechanisms to mitigate the associated agency costs between shareholder classes. Such evidence is broadly consistent with the view that dual class structures can be value-enhancing choices that help some companies to allocate decision rights to decision makers and allow them to focus on long-term strategic decisions rather than serving as a device used by insiders to enjoy the consumption of private benefits. Our results support the notion that dual class firms can add value and should not be viewed as unconditionally "bad" governance choices, consistent with arguments in Armstrong et al. (2010a).

The rest of this paper is organized as follows. Section 2 discusses the governance role of debt and states our hypotheses. Section 3 describes the data and reports descriptive statistics. Section 4 presents the primary empirical results on the bonding role of debt in dual class firms. Section 5 focuses on the specific monitoring mechanisms associated with debt financing. Section 6 describes our analyses of the capital market outcomes of debt financing. Section 7 concludes.

2. Hypotheses Development

Introducing a dual class ownership structure is arguably the most straightforward way to depart from the "one share, one vote" principle, and not surprisingly, dual class structures are among the most widely researched control-enhancing mechanisms (see Adams and Ferreira 2008 and Burkart and Lee 2008 for reviews of this literature). Such a separation of ownership and control introduces both costs and benefits. On the benefit side, it concentrates voting power in the hands of a few insiders, allowing them to follow their vision and influence managerial decisions in a way that enhances firm value without interference from external investors who may have divergent objectives (Burkart and Lee 2008).[4] In particular, a dual class structure can be desirable when too much monitoring by outsiders destroys valuable managerial initiatives (Burkart et al. 1997) or reduces incentives to make relationship-specific investments in human capital (Hart 1995). On the cost side, dual class ownership empowers controlling insiders to expropriate minority shareholders (Amit and Villalonga 2009, Zingales 1995, Nenova 2003), which creates a severe agency conflict among shareholder classes. Below, we discuss the governance role of debt in dual class companies and state our empirical predictions.

2.1. Role of Debt in Alleviating the Conflicts Among Shareholders in Dual Class Firms

We posit that controlling shareholders in dual class firms use debt as a mechanism to reduce agency costs associated with the conflict among shareholder classes. Specifically, debt leverages the power of outsiders, i.e., debtholders, whose interests in limiting self-serving behavior by controlling insiders overlap with those of outside (minority) shareholders. Jensen and Meckling (1976) show that insiders who have a less than 100% stake in the firm have incentives to overconsume private benefits (relative to the level that they would prefer if they had 100% equity ownership). This practice leads to an economic inefficiency because the consumption of private benefits is generally an unproductive activity that misallocates economic resources. Ultimately, the insiders bear the costs of such overconsumption because rational noncontrolling (minority) shareholders price protect to break even. Therefore, it is in the interest of controlling insiders to bond against the expropriation of

[4] To see one rationale for dual class structure, consider the collective action problem among multiple "claimholders'' who appoint a professional manager to act on their behalf. This problem can be viewed as a source of many governance problems (Shleifer and Vishny 1997, Becht et al. 2003). Small claimholders have no incentives or ability to acquire, process, or act upon information to monitor and discipline the manager. The board of directors also lacks monitoring incentives because it lacks a stake in the company. A common way to deal with the problem is to delegate monitoring to a large shareholder. However, individual wealth constraints and diversification considerations make it difficult to find a shareholder with a stake (e.g., over 5%) in a public firm. Thus, although the large shareholder has better monitoring incentives, such an investor still lacks control over decision making because of its relatively low voting power. Dual class shares provide such voting power and control over the management of the company, and as such, the ownership structures should dominate having a professional manager without an economic interest in the firm.

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resources from minority shareholders to a level that insiders would find optimal if the costs of private consumption were fully internalized. Because traditional governance mechanisms are not as effective when used in dual class firms (Gilson 1987, Gompers et al. 2010, Amit and Villalonga 2009, Masulis et al. 2009), debt becomes an appealing means of disciplining the insiders.

A natural question is why dual class firms do not simply unify their classes of shares instead of relying on debt financing as a mechanism for addressing the conflict among shareholder classes. Indeed, dual class unifications can be viewed as an extreme form of bonding where insiders give up entirely their private benefits of control. Our study takes a perspective that the choice of a dual class ownership is explained by the need for concentrated control, which, from a theoretical perspective, can have a number of benefits (see Burkart and Lee 2008). Unification of dual class shares would reduce insiders' power to unilaterally make strategic decisions on issues that lack sufficient support among diffused shareholders (e.g., due to the free-rider problem) or to respond to changes in the business environment (e.g., competition) in a timely manner. Debt, on the other hand, allows insiders to keep their control rights as long as they can continue to meet all the debtholder requirements. Therefore, to the extent that the benefits of maintaining flexibility in making decisions exceed the costs of bonding, bonding via debt should be preferred to unifying dual class shares.

In the context of dual class firms, debt can benefit outside (minority) shareholders by disciplining entrenched insiders in at least three broad ways. First, as argued by Jensen and Meckling (1976) and Jensen (1986, 1989), debt reduces both the incentives and the opportunities of controlling insiders to divert cash flows for private benefits consumption or to engage in empire building. This reduction is due to the fixed obligation to pay out these cash flows.

Second, debt serves as an alternative control mechanism when a company is distressed. Despite their voting power, inside shareholders can still lose control as a result of poor economic performance. The prospect of control being transferred to an outsider, possibly followed by bankruptcy or liquidation, strengthens the incentives to exert effort and to avoid unproductive activities such as perquisite consumption, the failure to liquidate unprofitable operations, and suboptimal investment decisions (Grossman and Hart 1982, Harris and Raviv 1990, Zwiebel 1996, Dewatripont and Tirole 1994). For example, debt disciplines the controlling party because, unlike "soft" shareholders, debtholders have stronger incentives to be tougher, e.g., to liquidate the firm when its economic performance is poor (Dewatripont and Tirole 1994).[5]

Third, lenders (particularly private lenders) exercise active monitoring and control over a company's affairs even outside of technical default or financial distress. As compared to dispersed shareholders, private lenders are more efficient monitors who are better placed to access internal information (Diamond 1984, Fama 1985). At the same time, debt contracts can govern a firm in a number of ways, including direct restrictions on managerial actions (e.g., liquidation of assets), the ability to veto internal decisions (e.g., director elections), the requirement to maintain economic performance, control over cash management, etc. These mechanisms enable debtholders to control and even replace inefficient management and boards of directors in response to unsatisfactory performance (Baird and Rasmussen 2006, Nini et al. 2012). Indeed, replacing an inefficient CEO who enjoys voting power benefits minority shareholders.[6]

[5] One issue that warrants discussion is whether debt represents a commitment to better governance. Commitment is a difficult problem in most economic settings and is generally addressed by writing contracts. Although commitment is typically a maintained assumption in the literature on the governance role of debt (e.g., Jensen 1986), companies are unlikely to use debt forever. Nevertheless, debt can still serve a useful disciplinary role. First, to reverse the issuance of debt, a company would need to replace debt with equity. This means that insiders would either need to sell more inferior shares at an even bigger discount or directly contribute more funds to the company. Both options are likely to be costly for insiders. Hence, when a company finances a considerable portion of assets with debt, it is difficult to change this overnight and hence reverse the prior commitment. Second, even when debt matures, most companies replace it with new debt. Companies that rely on debt of shorter maturities need to access debt markets on a frequent basis and thus will be subject to even greater scrutiny from the debtholders. Such interactions mitigate insider incentives to deviate from the efficient strategy ex post. Finally, if a company builds up significant equity via generating earnings that it retains inside the company, debt may be reduced or completely eliminated. However, in this case, debt would have served its purpose: the company generated equity that was not diverted or spent on perks (even in such a situation, a company may still decide to rebalance the capital structure toward more debt).

[6] Although arguments for the disciplinary role of debt in dual class companies are compelling (particularly given the lack of traditional governance mechanisms), we note that the regulatory and legal environment is very strong in the United States. Therefore, it is not clear to what extent debt alone contributes as a bonding mechanism. Harvey et al. (2004) focus on emerging market firms with pyramidal structures and find evidence supporting the conjecture that debt lowers agency costs and creates shareholder value in such firms. However, the benefits versus costs of control-enhancing structures (such as pyramids and dual class shares) depend on country-level institutional factors, and hence the bonding mechanisms required will also vary with these factors (Adams and Ferreira 2008). Therefore, although intuitive, it is not clear that these results will continue to hold in a developed economy with strong legal and institutional structures such as the United States. Our study focuses on the role of debt as a governance mechanism

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In sum, the interests of debtholders and noncontrolling shareholders to reduce the inefficient consumption of private benefits (including shirking, empire building, suboptimal investment decisions, and other such value-reducing actions) largely overlap. The key difference between these stakeholders, however, is that debtholders possess state-contingent control rights that make them capable of disciplining the insiders' private consumption, particularly when a company underperforms. As a result, insiders, who have incentives to bond against the excessive consumption of private benefits, should find debt to be more attractive. Effectively, in the presence of a conflict between shareholders, the disciplinary role of debt makes a marginal dollar of debt cheaper than a marginal dollar of outside equity. This, more formally, leads to the following bonding hypothesis.

Hypothesis 1 (H1). *On average, dual class firms employ higher levels of debt financing than single class firms.*

2.1.1. Cross-Sectional Predictions. To further improve our understanding of the role of debt in dual class firms, we perform several cross-sectional tests. We expect debt financing to be used more extensively (1) when agency conflicts between controlling insiders and minority shareholders are more severe, and (2) when firms have a greater amount of profitable growth opportunities and, hence, need to raise outside financing from the capital market. In particular, the incentives and ability to expropriate minority shareholders increase with the wedge between voting and cash flow rights (e.g., La Porta et al. 2002, Lins 2003, Gompers et al. 2010). Therefore, such firms are expected to employ debt more extensively in their capital structures.

Additionally, the benefits to bonding are likely to increase with investment opportunities or the need to issue outside equity (Doidge et al. 2004). In particular, growth companies with insufficient internal funds will likely issue inferior shares to raise capital on a more regular basis; such companies will benefit more from bonding. Therefore, we have the following two hypotheses.

Hypothesis 2A (H2A). *Dual class firms with higher agency conflicts, as evident through a greater separation between cash flow rights and voting rights, employ higher levels of debt financing.*

Hypothesis 2B (H2B). *Dual class firms with greater growth opportunities and a higher likelihood of raising equity rely on debt financing more extensively.*

2.2. Specific Bonding Mechanisms

In this subsection, we consider several specific mechanisms employed by creditors to monitor borrowers and investigate their disciplinary role in the context of dual class firms.

2.2.1. Private Debt and Lending Relationships. One mechanism that could limit insiders' incentives to consume perks is the stricter monitoring by private lenders. Private lenders are more efficient monitors than public debtholders are (Diamond 1984) because they have better access to internal information (Fama 1985), and are more actively involved in firm governance (Gorton and Winton 2002). Although public debtholders require a default on the interest or principal payment to intervene, they do not generally exercise control rights on a regular basis, especially outside of default or financial distress (e.g., Dichev and Skinner 2002, Baird and Rasmussen 2006, Nini et al. 2012). Private lenders (e.g., banks) also require timelier and more detailed information (relative to mandated disclosures) and are more involved in the decision-making process (Tung 2009, Shepherd et al. 2008). Therefore, they can protect minority shareholders by serving as delegated monitors, maintaining closer relationships with the borrower, and exercising tighter control rights over its management's decisions. Given this, dual class firms are more likely to employ private debt and relationship lending as mechanisms that limit private consumption.

Hypothesis 3A (H3A). *Reliance on private debt is more common in dual class firms than in single class firms.*

Hypothesis 3B (H3B). *Dual class firms are more likely than single class firms to maintain lending relationships.*

2.2.2. Governance Role of Covenants. Private debt covenants play a central role in disciplining insiders who enjoy control over a company (Baird and Rasmussen 2006, Nini et al. 2012). These covenants are designed to maintain a tight grip on a firm's affairs and are frequently violated and renegotiated (Dichev and Skinner 2002, Roberts and Sufi 2009).[7] The two types of covenants of interest here are cash sweeps and financial covenants.

Cash sweeps control the inflows and outflows of cash that are at the insider's disposal. For example,

in U.S.-based dual class firms. Our analyses also probe deeper into debt contracts and examine how specific mechanisms such as private debt and accounting covenants can help to alleviate agency conflicts in these firms. Finally, we consider the endogeneity of ownership structures and verify that our results are robust to several estimation methods and sensitivity tests with respect to omitted variables.

[7] Chava et al. (2010) provide evidence that public debt covenants are influenced by managerial entrenchment and fraud risk, implying the governance role of covenants. Public debt covenants are, however, rarely violated and hence are not expected to be as effective in disciplining management.

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they require remittance of a portion of cash from asset sales, e.g., to finance an acquisition, to debtholders. Because the diversion of free cash flows for private purposes is of particular concern in dual class firms, under the bonding hypothesis, these firms will rely on cash sweeps more intensively.

Hypothesis 4A (H4A). *Credit agreements in dual class firms are more likely to contain cash sweeps relative to those in single class firms.*

In contrast, financial covenants represent the state-contingent allocation of control to lenders by requiring a firm to maintain a certain level of accounting profitability or capital (e.g., minimum interest coverage). A failure to maintain these ratios triggers a technical default, which gives creditors a substantial power over the company. The renegotiations that follow covenant violations enable private lenders to interfere with the internal decisions of a firm's management, ranging from asset liquidations to CEO replacement (Chava and Roberts 2008, Roberts and Sufi 2009, Nini et al. 2009), and have been shown to benefit shareholders (Shepherd et al. 2008, Nini et al. 2012). As such, financial covenants represent a primary mechanism through which lenders can provide incentives and limit self-serving behavior of controlling insiders.

However, not all financial covenants are expected to be equally relevant in the context of dual class firms. Christensen and Nikolaev (2012) argue that financial covenants serve two distinct purposes. Capital-based covenants, i.e., covenants formulated in terms of balance sheet information, are typically used to align the interests of shareholders with those of creditors ex ante. Capital covenants lower creditors' incentives to monitor managerial actions but instead incentivize shareholders to perform the monitoring and to maintain the insider's focus on firm value maximization. In the context of dual class firms, capital covenants are less likely to be helpful because there is no need to incentivize minority shareholders to monitor the management due to their lack of control rights. In contrast, performance-based covenants, i.e., covenants formulated in terms of current performance and efficiency ratios, act as trip wires that detect deteriorations in a firm's performance and trigger control transfers to lenders when a company underperforms. As such, performance-based covenants facilitate the creditors' ability to interfere with poor management and should be useful from a bonding perspective. These arguments suggest the following two predictions.

Hypothesis 4B (H4B). *Credit agreements in dual class firms are more likely to contain performance-based covenants relative to those in single class firms.*

Hypothesis 4C (H4C). *Credit agreements in dual class firms are less likely to use capital-based covenants relative to those in single class firms.*

2.3. Capital Market Outcomes of Debt Financing in Dual Class Firms

To corroborate the evidence of the reliance on debt financing and the associated monitoring mechanisms employed by dual class firms, we further investigate the valuation implications of debt financing for these firms. We assume that companies are, on average, at their optimal levels of debt for bonding purposes. However, this may not be the case at all points in time because companies sometimes issue (or retire) debt for exogenous reasons, such as liquidity shocks, and, hence, may deviate from the optimality for some time. To the extent that debt financing acts as a bonding mechanism that reduces the scope for private consumption, dual class firms are expected to experience a positive stock price reaction in response to debt issuances. In line with our prior arguments, we expect private debt to be more valuable, from a bonding perspective, than public debt, given the stricter and more active monitoring by private lenders. If private debt indeed facilitates bonding and protects minority investors from expropriation by controlling insiders, we expect that private debt issuances should elicit a stronger positive market reaction for inferior dual class shares, compared to either the corresponding reactions for superior dual class shares or to a matched sample of single class firm shares.

Hypothesis 5A (H5A). *The stock market reaction to private debt issuances is significantly higher for inferior dual class shares relative to superior dual class shares and to a matched sample of single class firms.*

Next, the stock market's implications associated with dual class ownership structures are also expected to vary with debt levels to the extent that debt alleviates the conflict among the classes of shares. Thus, we revisit the association between the presence of a dual class ownership structure and Tobin's q, a proxy for firm value or asset productivity explored in Gompers et al. (2010). These authors find that, in the United States, Tobin's q is adversely affected by the presence of dual class ownership and the associated separation of voting and cash flow rights. To the extent that debt plays a disciplinary role in dual class companies, we expect dual class firms with higher levels of debt to be less likely to exhibit a negative valuation effect.

Hypothesis 5B (H5B). *The negative effect of dual class ownership on Tobin's q is attenuated in dual class firms with higher levels of debt.*

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Finally, several studies document that, in dual class firms with different voting rights, the stock with the superior voting rights trades at a premium (Lease et al. 1983, 1984). This premium generally stems from the value of the private benefits of control (Zingales 1995).[8] Thus, differences in the control rights enjoyed by the holders of superior shares will be reflected in the voting premiums of these shares. If insiders use debt to bond against the consumption of the private benefits of control (to expropriate minority shareholders), then dual class firms with higher levels of debt should have lower voting premiums. The above arguments lead to the following prediction.

Hypothesis 5C (H5C). *Dual class firms with higher leverage have lower voting premiums.*

3. Data and Descriptive Statistics

We obtain our sample of dual class firms from two sources: (1) the dual class data set constructed by Gompers et al. (2010) (henceforth, the GIM sample), which spans the period 1994–2002 and (2) the Capital IQ equity structure database. Capital IQ obtains information mainly from press releases, company websites, global stock exchanges, and direct feeds from SEC, SEDAR, ASX, and RNS; the database provides equity capital structure data for over 80,000 public and private companies worldwide over the period 1994–2010. Using this database allows us to expand the GIM sample. We begin by searching the Capital IQ database for firms that have two different types of equity for at least two consecutive years in order to identify dual class firms (we search "Capital Structure Description" under the equity capital structure section). We find that the majority of dual class firms obtained from Capital IQ overlap with those in the GIM sample. Specifically, of the 741 firms in the GIM sample, 604 are also present in Capital IQ. Of the remaining 137 firms, 30 firms only have a dual class structure for one year and 107 firms are not covered by Capital IQ. Therefore we choose to include the 107 dual class firms in the sample. Capital IQ further identifies 443 firms with two types of equity that are not present in the GIM sample. Because some companies issue preferred stock, we manually determine the firms that have two different classes of common stock during the sample period by going through their proxy statements. This procedure yields 175 firms (of 443) that are included to our sample.

Table 1 Sample Selection

Sample	Total	Dual	Single
Nonfinancial firm-years in Compustat/CRSP 1994–2010	69,780	4,556	65,224
After requiring nonmissing leverage and firm control variables	47,923	3,258	44,665
Leverage analyses			
OLS and PSM sample	47,923	3,258	44,665
IV sample	40,725	2,751	37,974
Private loan analyses			
OLS and PSM sample	40,119	2,867	37,252
IV sample	34,138	2,447	31,691
Private loan packages issued by nonfinancial firms from 1994–2010 and in the DealScan database	22,380	1,847	20,533
After requiring nonmissing deal-level control variables	15,236	1,243	13,993
Relationship lending analyses			
OLS and PSM sample	12,452	1,062	11,390
IV sample	10,619	872	9,747
Cash sweeps analyses			
OLS and PSM sample	15,236	1,243	13,993
IV sample	13,002	1,018	11,984
Financial covenants analyses			
OLS sample	8,030	720	7,310
IV sample	6,849	601	6,248

Notes. This table summarizes the information regarding the sample of firms used in testing the main hypotheses and across the various econometric techniques used in the paper. For each analysis, we require nonmissing data for all control variables. Specifications that use instruments also require data on nonmissing instrumental variables, which further limits the sample. OLS, ordinary least squares. IV, instrumental variable.

Our initial sample consists of 886 unique dual class firms over the period 1994–2010. After merging this sample with the Compustat and Center for Research in Security Prices (CRSP) merged database and removing all financial service firms (SIC codes between 6,000 and 6,999), we are left with 4,556 dual class firm-years (613 unique firms). A sample of 65,224 single class firm-years (8,340 unique firms) is available over the same period. The restrictions of nonmissing leverage and other firm-specific control variables and the exclusion of financial service companies further reduce the sample to 3,258 dual class firm-years (495 unique firms) and 44,665 single class firm-years (6,726 unique firms). We obtain all firm-level capital structure and other control variables from CRSP and Compustat, and analyst data from I/B/E/S.

We obtain the data on private debt contracts from the DealScan database. We merge DealScan with Compustat using the DealScan–Compustat link, constructed and maintained by Michael Roberts and Wharton Research Data Services (WRDS) (see Chava and Roberts 2008). This procedure yields a sample

[8] Note that superior class shares command a premium, in part, when there is a possibility of control change. It is important to note that we do not argue that dual class firms are not subject to possible changes in control. These structures are more immune to hostile takeovers (e.g., those not likely to increase firm value). However, dual class structures can facilitate value-enhancing acquisitions because they allow controlling insiders to overcome the free-rider problems and to negotiate on behalf of other shareholders.

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of 2,867 dual class firm-years and 37,252 single class firm-years for the analysis of the presence of private loan contracts. If a credit agreement includes several credit facilities (tranches), we aggregate information at the deal (i.e., contract) level. This procedure yields a sample of 1,847 loans issued to dual class firms and 20,553 loans issued to single class firms. Some of our models require additional loan characteristics, which introduce further data restrictions. We impose these data restrictions as they become necessary to maximize the sample size. As a result, our samples vary across different types of analyses. For convenience, Table 1 provides summary information about the samples used in different tests and their composition.

We provide descriptive statistics for our samples in Table 2. Panel A is based on our most comprehensive sample, whereas panel B is based on the sample obtained after merging the initial sample with DealScan. We present the mean and median of firm characteristics across the two samples, and we test for differences between single and dual class firms. The dual class firms differ significantly from the single class firms in several aspects. Specifically, compared to single class firms, dual class firms are larger and are more profitable. Dual class firms are also older and more mature. They have lower growth and lower capital expenditures, spend less on research and development, and have lower betas and stock price volatility. At the deal level, dual class firms issue loans with higher amounts (as a proportion of their assets) and longer maturities than do single class firms.

4. Main Results

In this section, we examine the relation between the presence of dual class ownership and the level of debt in a firm's capital structure. The main challenge we face is that dual class ownership is an endogenous choice dictated by the need for greater control over a company (DeAngelo and DeAngelo 1985). One feature of our setting is that the dual class ownership is predetermined at the time of the debt contract initiation and hence is not a part of the loan negotiation process (i.e., the reverse causality is unlikely to be an issue). However, unobservable differences that affect financing decisions may exist between dual class and single class firms, causing an omitted variables or sample selection bias (Gompers et al. 2010). Specifically, both dual class structure and the choice of debt may be driven by other factors that jointly determine the optimal capital structure. The decision to use a dual class structure is likely to depend on the investment opportunities set and other firm and manager characteristics (Demsetz and Lehn 1985, Himmelberg et al. 1999). To the extent that we are unable to control for all such factors, we face a correlated omitted variables problem. Therefore, we start by presenting OLS regressions with a comprehensive set of control variables and then address the potential endogeneity via propensity score matching, an instrumental variables analysis, and treatment effects models.

4.1. Baseline Leverage Model

To examine the association between leverage and dual class ownership, we build on the prior literature and use the following model:

$$\begin{aligned} LEV = {} & \alpha_0 + \alpha_1 DUAL + \alpha_2 SIZE + \alpha_3 BTM + \alpha_4 DIV \\ & + \alpha_5 ROA + \alpha_6 TANGIBILITY + \alpha_7 SG\&A \\ & + \alpha_8 CAPEX + \alpha_9 REV\_GROWTH + \alpha_{10} R\&D \\ & + \alpha_{11} STD\_RET + \alpha_{12} BETA + \alpha_{13} FIRM\_AGE \\ & + \alpha_{14} \#SEGMENTS + \alpha_{15} TAX\ CREDIT \\ & + \alpha_{16} LOG\#ANALYSTS + \alpha_{17} BASPREAD \\ & + \alpha_{18} STD\_DA + \alpha_{19} STD\_ROA \\ & + \alpha_{20} LOSS + \varepsilon, \end{aligned} \tag{1}$$

where the dependent variable is either market leverage (*LEV_MKT*) or book leverage (*LEV_BK*). We define market leverage as total liabilities divided by the market value of equity plus the book value of liabilities, and book leverage as total liabilities divided by the book value of assets. The main variable of interest is the indicator variable *DUAL*, which equals 1 for dual class firms, and 0 otherwise. The control variables in Equation (1) are based on the literature on the determinants of leverage (e.g., Faulkender and Peterson 2006, Titman and Wessels 1988, Lemmon et al. 2008, Frank and Goyal 2009). We also include several additional control variables to control for differences across firms in their information environments and accounting reporting quality, such as the variability of discretionary accruals, analyst coverage, and the bid–ask spread, which represent alternative channels for alleviating inefficient investments in dual class firms (e.g., Biddle et al. 2009). Appendix A provides a detailed description of all the variables used in our tests.

Table 3 presents the results from the OLS analyses. The estimates in columns (1) and (2) correspond to market leverage and book leverage, respectively, as dependent variables. In both columns, the coefficients on *DUAL* are positive and significant at the 1% level, suggesting that dual class firms have higher levels of debt on average. Specifically, market leverage (book leverage) is higher in dual class firms by 0.03 (0.04) on average, compared to single class firms. This corresponds to 21% (20%) of the mean for market (book)

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Table 2 Descriptive Statistics

	Single class firms			Dual class firms		
Variable	Mean	Median	Std. dev.	Mean	Median	Std. dev.
Panel A: Comparison between dual class and single class firms						
SIZE	5.707	5.650	2.067	6.111***	6.203***	1.781
BTM	0.624	0.496	0.517	0.715***	0.570***	0.579
DIV	0.009	0.000	0.017	0.009**	0.000***	0.016
ROA	−0.022	0.034	0.201	0.017***	0.035***	0.131
TANGIBILITY	0.288	0.211	0.239	0.278**	0.221*	0.209
SG&A	0.274	0.219	0.251	0.267	0.214	0.237
CAPEX	0.058	0.041	0.057	0.054***	0.039**	0.049
REV_GROWTH	1.157	1.091	0.401	1.123***	1.074***	0.305
R&D	0.040	0.002	0.082	0.021***	0.000***	0.061
STD_RET	0.038	0.033	0.020	0.032***	0.027***	0.017
BETA	1.145	1.056	0.724	1.026***	0.944***	0.636
FIRM_AGE	2.617	2.565	0.744	2.718***	2.708***	0.745
#SEGMENTS	2.649	2.000	1.855	2.568**	2.000	1.700
TAX CREDIT	0.031	0.000	0.172	0.007***	0.000***	0.086
LOG#ANALYSTS	1.183	1.126	1.013	1.285***	1.365***	0.963
BASPREAD	0.024	0.014	0.028	0.020***	0.012***	0.025
STD_DA	0.057	0.042	0.051	0.042***	0.033***	0.037
STD_ROA	0.105	0.050	0.204	0.057***	0.030***	0.132
LOSS	0.310	0.000	0.463	0.237***	0.000***	0.425
WEDGE				0.221	0.220	0.178
No. of observations		44,665			3,258	
Panel B: Comparison in firm and deal characteristics between dual class and single class firms						
Firm level						
LEV_MKT	0.202	0.179	0.150	0.239**	0.219***	0.163
PROP_SHORT	0.275	0.181	0.290	0.230***	0.133***	0.266
SIZE	6.854	6.926	2.011	6.845	6.799	1.647
BTM	0.596	0.495	0.478	0.629**	0.526*	0.545
ROA	0.017	0.036	0.122	0.016	0.028***	0.098
ALTMAN_ZSCORE	2.797	2.361	2.319	2.541***	2.330***	1.910
FIRM_AGE	2.802	2.708	0.816	2.727***	2.708***	0.792
STD_RET	0.031	0.026	0.016	0.028***	0.025***	0.014
BASPREAD	0.017	0.010	0.022	0.015*	0.010	0.018
STD_DA	0.045	0.033	0.038	0.037***	0.029***	0.030
STD_ROA	0.062	0.034	0.096	0.045***	0.026***	0.080
CONVERTIBLE	0.183	0.000	0.387	0.171	0.000	0.376
Deal level						
SECURED_DEBT	0.397	0.000	0.489	0.393	0.000	0.489
LOAN_SIZE	0.210	0.148	0.205	0.224**	0.173***	0.198
MATURITY	3.578	3.709	0.757	3.758***	4.094***	0.765
REVOLVER	0.680	1.000	0.467	0.702	1.000	0.458
No. of observations		13,993			1,243	

Notes. This table presents the comparisons of the mean and median firm-level and deal-level variables between dual class firms and single class firms. Panel A provides comparisons for the full sample of firms, whereas panel B provides comparisons for the sample obtained after merging with DealScan. The variables are defined as follows (see Appendix A for detailed definitions and their sources). *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *DIV* is the ratio of the common dividends declared divided by the market capitalization; *ROA* is income before extraordinary items divided by average total assets; *TANGIBILITY* is the ratio of total net property, plant, and equipment (PPE) to total assets; *SG&A* is the ratio of selling, general, and administrative expenses to sales; *CAPEX* is the ratio of capital expenditures to sales; *REV_GROWTH* is the ratio of current year revenues to prior year revenues; *R&D* is the ratio of research and development expenses to market capitalization; *STD_RET* is the variance of monthly stock returns over the prior year; *BETA* is calculated over the preceding year based on the correlation of daily stock returns with daily returns on an equally weighted market index; *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *#SEGMENTS* is an indicator variable that equals 1 when the firm has more than one Compustat business segment during the fiscal year, and 0 otherwise; *TAXCREDIT* is an indicator variable that equals 1 when an investment tax credit is present, and 0 otherwise; *LOG#ANALYSTS* is the logarithm of 1 plus the number of analysts following the firm; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *LOSS* is a dummy variable that equals 1 if net income is negative; *WEDGE* is the difference between insider voting and cash flow rights; *LEV_MKT* is the total debt held by the firm divided by the market value of equity plus the book value of liabilities; *PROP_SHORT* is the fraction of total debt that matures in 3 years or less; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED_DEBT* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal package. The comparison of means is based on a two-sided *t*-test, and the comparison of medians is based on a Wilcoxon rank-sum test.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

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Table 3 Dual Class Firms and Leverage: OLS Regression Results

	(1) *LEV_MKT*	(2) *LEV_BK*	(3) *LEV_MKT*	(4) *LEV_BK*
DUAL	0.035***	0.043***	0.018***	0.020***
	(5.49)	(5.57)	(2.99)	(2.71)
SIZE	−0.002	0.003	−0.004***	−0.001
	(1.11)	(1.64)	(3.25)	(0.69)
BTM	0.056***	−0.017***	0.043***	−0.031***
	(10.21)	(3.52)	(9.14)	(6.51)
DIV	0.226	0.189	−0.011	−0.064
	(1.46)	(0.96)	(0.07)	(0.35)
ROA	−0.032***	−0.055***	−0.031***	−0.051***
	(4.71)	(5.60)	(4.34)	(5.06)
TANGIBILITY	0.230***	0.272***	0.212***	0.254***
	(22.46)	(27.03)	(19.19)	(20.63)
SG&A	−0.090***	−0.112***	−0.094***	−0.115***
	(16.02)	(17.30)	(16.99)	(15.35)
CAPEX	−0.385***	−0.409***	−0.388***	−0.421***
	(12.75)	(12.53)	(13.96)	(14.14)
REV_GROWTH	0.015***	0.019***	0.015***	0.019***
	(4.33)	(4.86)	(5.25)	(5.48)
R&D	−0.139***	−0.136***	−0.031**	−0.008
	(7.94)	(6.61)	(2.23)	(0.50)
STD_RET	−0.264	−0.376**	−0.415*	−0.576**
	(1.43)	(1.98)	(1.87)	(2.47)
BETA	0.002	−0.002	0.006**	0.003
	(0.67)	(0.55)	(2.25)	(1.14)
FIRM_AGE	0.001	0.000	0.003	0.003
	(0.24)	(0.09)	(1.10)	(1.07)
#SEGMENTS	0.003***	0.002**	0.004***	0.004***
	(2.78)	(2.02)	(4.92)	(3.94)
TAX CREDIT	0.010	−0.008	−0.025**	−0.031***
	(1.13)	(0.87)	(2.45)	(2.78)
LOG#ANALYSTS	0.008***	0.010***	0.009***	0.011***
	(3.93)	(4.09)	(4.39)	(4.73)
BASPREAD	0.325***	0.497***	0.240***	0.413***
	(3.78)	(4.60)	(2.95)	(4.68)
STD_DA	−0.197***	−0.236***	−0.175***	−0.209***
	(7.48)	(7.79)	(7.12)	(6.80)
STD_ROA	−0.028***	−0.028***	−0.016***	−0.013**
	(5.34)	(3.97)	(3.71)	(2.21)
LOSS	0.020***	0.027***	0.024***	0.030***
	(6.53)	(7.96)	(7.71)	(8.84)
FF ind./Year dummies	No	No	Yes	Yes
No. of observations	47,923	47,923	47,677	47,677
Adjusted *R*-squared	0.29	0.23	0.34	0.28

Notes. This table presents the OLS regression results for the association between leverage and dual class ownership. The dependent variable is either the book value of leverage (*LEV_BK*) or the market value of leverage (*LEV_MKT*). The dependent and independent variables are defined as follows (see Appendix A for detailed definitions and their sources). *LEV_BK* is the ratio of the total debt to the book value of equity; *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *DIV* is the ratio of the common dividends declared divided by the market capitalization; *ROA* is income before extraordinary items divided by average total assets; *TANGIBILITY* is the ratio of total net PPE to total assets; *SG&A* is the ratio of selling, general, and administrative expenses to sales; *CAPEX* is the ratio of capital expenditures to sales; *REV_GROWTH* is the ratio of current year revenues to prior year revenues; *R&D* is the ratio of research and development expenses to market capitalization; *STD_RET* is the variance of monthly stock returns over the prior year; *BETA* is calculated over the preceding year based on the correlation of daily stock returns with daily returns on an equally weighted market index; *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *#SEGMENTS* is an indicator variable that equals 1 when the firm has more than one Compustat business segment during the fiscal year, and 0 otherwise; *TAXCREDIT* is an indicator variable that equals 1 when an investment tax credit is present, and 0 otherwise; *LOG#ANALYSTS* is the logarithm of 1 plus the number of analysts following the firm; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *LOSS* is a dummy variable that equals 1 if net income is negative. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics in parentheses are based on robust standard errors double clustered by firm and year. FF ind. represents Fama–French 48-industry classification.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

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leverage. The coefficients on the control variables are generally consistent with prior literature; for the sake of brevity, we do not elaborate on them. We also repeat the analyses by including year and industry fixed effects. The results are reported in columns (3) and (4) of Table 3, and they are analogous to those in columns (1) and (2). Next, we discuss several alternative econometric approaches that we employ to control for the endogeneity bias to which the OLS results may be subject.

4.2. Propensity Score Matching Analysis

Ideally, we need to run an experiment that compares companies with identical economic determinants of the outcome variables of interest (e.g., leverage) except for their dual class status. In such cases, the observed differences in the outcome variables can be attributed to the effect of dual class ownership. Although such an experiment is not feasible, matching techniques offer a viable alternative. We employ the propensity score matching (PSM) technique described in Heckman et al. (1997, 1998) and used in several recent studies (Drucker and Puri 2005, Bharath et al. 2011, Armstrong et al. 2010b). The resulting matched control group of single class firms is observationally equivalent to dual class firms with respect to the observable determinants of capital structure. The matching procedure employs the following logistic regression:

$$\begin{aligned}\text{Prob}(DUAL) &= \Lambda(\beta_0+\beta_1 SIZE+\beta_2 BTM+\beta_3 DIV+\beta_4 ROA\\ &\quad+\beta_5 TANGIBILITY+\beta_6 SG\&A+\beta_7 CAPEX\\ &\quad+\beta_8 REV\_GROWTH+\beta_9 R\&D+\beta_{10} STD\_RET\\ &\quad+\beta_{11} BETA+\beta_{12} FIRM\_AGE+\beta_{13}\#SEGMENTS\\ &\quad+\beta_{14} TAX\_CREDIT+\beta_{15} LOG\#ANALYSTS\\ &\quad+\beta_{16} BA\_SPREAD+\beta_{17} STD\_DA+\beta_{18} STD\_ROA\\ &\quad+\beta_{19} LOSS+\varepsilon), \qquad (2)\end{aligned}$$

where the model specification is analogous to that in Equation (1) and all variables are as defined previously and in Appendix A. Each dual class firm-year is matched with a set of single class firm-year observations based on the estimated probability (propensity score) from model (2) using the nearest-neighbor estimator (Heckman et al. 1997, 1998).[9] The coefficient estimates for Equation (2) are provided in Appendix B (panel A). We verify the absence of a covariate imbalance between the treatment and control groups.

Table 4 presents the results for book leverage (*LEV_BK*) and market leverage (*LEV_MKT*) using the PSM methodology. We report the leverage comparisons between both the matched and unmatched pairs of dual class and single class firms and the *t*-statistics for the differences between the means. Before matching, dual class firms have significantly higher leverage (0.21 for *LEV_BK*; 0.17 for *LEV_MKT*) than single class firms do (0.16 for *LEV_BK*; 0.12 for *LEV_MKT*). Dual class companies continue to exhibit higher leverage compared to the propensity score matched single class sample (0.21 vs. 0.17 for *LEV_BK*; 0.17 vs. 0.14 for *LEV_MKT*). The *t*-statistics for the differences in book and market leverage are 5.16 and 4.94, respectively, both of which are statistically significant. The above results are consistent with the bonding hypothesis, under which dual class firms rely on debt financing more extensively.

4.2.1. Sensitivity to Hidden Bias. One important limitation of the PSM methodology is the assumption that the researcher observes all relevant determinants of the outcome variable. If there are unobservable variables that simultaneously affect the assignment to the treatment and the outcome variables, a hidden bias might arise (e.g., Rosenbaum 2002, Armstrong et al. 2010b). In order to estimate the extent to which the "selection on unobservables" may bias our inferences, we conduct a sensitivity analysis. The approach we use is motivated by Rosenbaum and Rubin (1983), and was developed and applied by Altonji et al. (2005, 2008). The basic idea behind this approach is that the degree of the selection into the treatment group based on the observed explanatory variables can serve as an indication of the extent to which the selection based on the unobserved variables is likely to be an issue. In other words, one can evaluate the extent of the potential hidden bias by examining the ratio of the degree of selection on unobservables that would be required if one were to attribute the entire treatment effect to the selection bias relative to the degree of the selection on observables. This approach has an advantage over the "bounding approach" in Rosenbaum (2002) because it does not rely on arbitrary bounds (Armstrong et al. 2010b, Lee and Lee 2009). We provide additional discussion and an explanation of this methodology in Appendix C. Based on this analysis, we find that in order to attribute the entire effect of dual class ownership on leverage to hidden bias, the selection on unobservables would need to be, respectively, 1.43 and 2.45 times stronger (see Appendix C) than the selection on observables in the case of market and book leverages. This seems highly unlikely, particularly because observables are not chosen randomly (Altonji et al. 2005). Overall, the results of this

[9] The nearest-neighbor estimator chooses, for each dual class firm-year, the n single class firm-year observations with the closest propensity scores and uses the arithmetic average of the leverage variables (debt characteristics in the subsequent analyses) of the n single class firm-years (we use $n=30$ in the reported results; our results are robust to using $n=10$ and $n=50$).

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Table 4 Dual Class Firms and Leverage

Panel A: Propensity score matching analyses

Variable	Sample	Dual	Single	Diff	*t*-statistic
LEV_BK	Unmatched	0.211	0.164	0.048	15.10***
	Matched	0.211	0.172	0.039	5.16***
LEV_MKT	Unmatched	0.168	0.124	0.044	16.80***
	Matched	0.168	0.137	0.031	4.94***

Panel B: Instrumental variables regression analyses of leverage

	DUAL (First stage)	*LEV_MKT* (Second stage)	*DUAL* (First stage)	*LEV_BK* (Second stage)
DUAL		0.149***		0.224***
		(5.36)		(6.22)
SIZE	0.007**	−0.003**	0.007**	0.000
	(2.38)	(2.00)	(2.38)	(0.25)
BTM	0.039***	0.051***	0.039***	−0.026***
	(5.12)	(9.86)	(5.12)	(5.11)
DIV	−0.300	0.327*	−0.300	0.331
	(1.50)	(1.94)	(1.50)	(1.62)
ROA	−0.011	−0.025***	−0.011	−0.045***
	(0.91)	(3.67)	(0.91)	(4.58)
TANGIBILITY	−0.015	0.236***	−0.015	0.283***
	(0.81)	(21.94)	(0.81)	(24.50)
SG&A	0.032*	−0.095***	0.032*	−0.117***
	(1.96)	(15.59)	(1.96)	(15.62)
CAPEX	−0.076	−0.375***	−0.076	−0.400***
	(1.61)	(12.65)	(1.61)	(11.85)
REV_GROWTH	−0.002	0.014***	−0.002	0.018***
	(0.61)	(4.72)	(0.61)	(5.15)
R&D	−0.088***	−0.128***	−0.088***	−0.114***
	(2.64)	(7.25)	(2.64)	(5.34)
STD_RET	−0.612***	−0.131	−0.612***	−0.190
	(3.81)	(0.71)	(3.81)	(1.03)
BETA	−0.004	0.003	−0.004	0.000
	(1.02)	(1.02)	(1.02)	(0.09)
FIRM_AGE	−0.000	−0.000	−0.000	−0.001
	(0.04)	(0.02)	(0.04)	(0.19)
#SEGMENTS	−0.004***	0.003***	−0.004***	0.003***
	(2.65)	(3.74)	(2.65)	(3.17)
TAXCREDIT	−0.043***	0.014	−0.043***	−0.000
	(3.14)	(1.57)	(3.14)	(0.02)
LOG#ANALYSTS	−0.004	0.009***	−0.004	0.012***
	(1.12)	(4.23)	(1.12)	(4.49)
BASPREAD	−0.008	0.301***	−0.008	0.460***
	(0.06)	(3.61)	(0.06)	(4.37)
STD_DA	−0.130***	−0.179***	−0.130***	−0.209***
	(3.05)	(6.63)	(3.05)	(6.37)
STD_ROA	−0.027***	−0.022***	−0.027***	−0.019***
	(3.34)	(4.38)	(3.34)	(2.86)
LOSS	−0.007	0.021***	−0.007	0.027***
	(1.33)	(6.44)	(1.33)	(7.31)
FAMILY	0.057***		0.057***	
	(3.69)		(3.69)	
MEDIA	0.419***		0.419***	
	(8.63)		(8.63)	

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Table 4 (Continued)

Panel B: Instrumental variables regression analyses of leverage (continued)				
	DUAL (First stage)	*LEV_MKT* (Second stage)	*DUAL* (First stage)	*LEV_BK* (Second stage)
%SALEMSA_IPO	0.597		0.597	
	(1.15)		(1.15)	
SALES/REG SALES	−0.013		−0.013	
	(1.06)		(1.06)	
No. of observations	40,725	40,725	40,725	40,725
Adjusted *R*-squared	0.09		0.09	
Partial *R*-squared		0.069		0.069
Partial *F*-statistic		$F_p = 21.81$		$F_p = 21.81$
		$(p = 0.0000)$		$(p = 0.0000)$
Overidentifying restriction		$\chi 2 = 0.593$		$\chi 2 = 1.896$
		$(p = 0.8980)$		$(p = 0.5942)$
Hausman test		$F = 21.3882$		$F = 29.5432$
		$(p = 0.0000)$		$(p = 0.0000)$

Notes. Panel A presents the results for the differences in book and market leverage for dual class firms versus both the unmatched and propensity score matched samples of single class firms. Each dual class firm-year observation is matched with a single class firm-year observation based on the propensity score (the estimated probability of dual class membership) using the nearest-neighbor estimator (we use $n = 30$ and verify robustness of the results to $n = 10$ and $n = 50$). The outcome variables are as follows. *LEV_BK* is the total debt held by the firm divided by the book value of assets of the firm; *LEV_MKT* is the total debt held by the firm divided by the market value of equity plus the book value of liabilities. Propensity score matching is carried out based on the following observable covariates: *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *DIV* is the ratio of the common dividends declared divided by the market capitalization; *ROA* is income before extraordinary items divided by average total assets; *TANGIBILITY* is the ratio of total net PPE to total assets; *SG&A* is the ratio of selling, general, and administrative expenses to sales; *CAPEX* is the ratio of capital expenditures to sales; *REV_GROWTH* is the ratio of current year revenues to prior year revenues; *R&D* is the ratio of research and development expenses to market capitalization; *STD_RET* is the variance of monthly stock returns over the prior year; *BETA* is calculated over the preceding year based on the correlation of daily stock returns with daily returns on an equally weighted market index; *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *#SEGMENTS* is an indicator variable that equals 1 when the firm has more than one Compustat business segment during the fiscal year, and 0 otherwise; *TAXCREDIT* is an indicator variable that equals 1 when an investment tax credit is present, and 0 otherwise; *LOG#ANALYSTS* is the logarithm of 1 plus the number of analysts following the firm; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *LOSS* is a dummy variable that equals 1 if net income is negative. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics for the matched comparison are based on bootstrapped standard errors.

Panel B presents the first and second stage results of the IV model (estimated using the generalized method of moments) on the association between market leverage and dual class ownership. The dependent and independent variables are defined as follows (see Appendix A for detailed definitions and their sources). *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *LEV_BK* is the total debt held by the firm divided by the book value of assets of the firm; *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *DIV* is the ratio of the common dividends declared divided by the market capitalization; *ROA* is income before extraordinary items divided by average total assets; *TANGIBILITY* is the ratio of total net PPE to total assets; *SG&A* is the ratio of selling, general, and administrative expenses to sales; *CAPEX* is the ratio of capital expenditures to sales; *REV_GROWTH* is the ratio of current year revenues to prior year revenues; *R&D* is the ratio of research and development expenses to market capitalization; *STD_RET* is the variance of monthly stock returns over the prior year; *BETA* is calculated over the preceding year based on the correlation of daily stock returns with daily returns on an equally weighted market index; *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *#SEGMENTS* is an indicator variable that equals 1 when the firm has more than one Compustat business segment during the fiscal year, and 0 otherwise; *TAXCREDIT* is an indicator variable that equals 1 when an investment tax credit is present, and 0 otherwise; *LOG#ANALYSTS* is the logarithm of 1 plus the number of analysts following the firm; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model; *STD_ROA* is the standard deviation of the return on assets; *LOSS* is a dummy variable that equals 1 if net income is negative; *FAMILY* is a dummy variable that equals 1 if the firm is a family firm in its IPO year; *MEDIA* is a dummy variable that equals 1 if the firm is in the media industry in its IPO year; *%SALEMSA_IPO* is the percentage of all Compustat sales by firms located in the same metropolitan or micropolitan statistical area (MSA) as a firm in the year before the firm's IPO; *SALES/REG SALES* is the ratio of a firm's sales to the sales of all firms in the same region. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics in parentheses are robust standard errors double clustered by firm and year.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

sensitivity analysis suggest that the selection on unobservables is unlikely to explain our results.

4.3. Instrumental Variables Estimation

An alternative approach to deal with the presence of unobservable determinants of dual class ownership is to use instruments that are correlated with the choice of dual class structure but that do not directly affect leverage decisions (except through ownership structure). Although valid instruments are notoriously difficult to find, we use the following approach to identify the set of instruments for our study. Following Gompers et al. (2010), we consider the following set of instruments: an indicator for companies

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named after their founders in the IPO year (*FAMILY*), an indicator for whether a firm is in the media industry during the IPO year (*MEDIA*), the percentage of all Compustat sales by firms located in the same metropolitan or micropolitan statistical area (MSA) in the year before the firm's IPO (*%SALESMSA_IPO*), the ratio of the firm's sales to the sales of all firms in the same region (*SALES/REG SALES*), the percentile ranking of the IPO-year sales of a firm relative to other firms with the same IPO year (*SALESRANK*), the percentile ranking of the IPO-year profits of a firm relative to other firms with the same IPO year (*PROFITRANK*), and the percentage of firms located in the same MSA in the year before the firm's IPO (*%FIRMSMSA_IPO*). We narrow down this set to four instruments by following the approach described in Hayashi (2000, p. 220) that allows testing the validity of a subset of instruments. This approach results in the following set of instruments, which we use throughout the paper as a subset of valid instruments: *FAMILY*, *MEDIA*, *%SALEMSA_IPO*, and *SALES/REG SALES*.[10] We also note that including all seven instruments generally does not change our conclusions.

The results of our instrumental variables (IV) analysis are presented in Panel B of Table 4 for both market and book leverage. Columns (1) and (2) present the first- and second-stage model estimates for market leverage, whereas columns (3) and (4) present the first- and second-stage model estimates for book leverage. The first-stage models in columns (1) and (3) indicate that instruments exhibit a statistically significant relation with the dual class indicator; the results are similar to those in Gompers et al. (2010). For both market leverage (column 2) and book leverage (column 4), the coefficients on *DUAL* remain positive and statistically significant. The effect of dual structures on leverage is considerably higher in both cases compared to its OLS counterpart. Specifically, on average, dual class firms exhibit a 0.15 (0.22) higher market leverage (book leverage) than do single class firms. In terms of the economic magnitude, this analysis suggests that the leverage of dual class firms is almost two times higher than that of single class firms. Overall, the results of IV analysis are consistent with the bonding hypothesis.

Given that the inferences drawn from the above analysis directly depend on the quality of the instruments, we report the partial *F*-statistic and partial *R*-squared from the first-stage regression to investigate the potential weak instrument problem. In estimating the first-stage regression, we include all independent variables, not just the selected instruments. We follow the guideline on the critical value of partial *F*-statistics suggested in Stock et al. (2002) to evaluate the presence of weak instruments. The results of these tests are reported at the bottom of Table 4. For our main analysis of market leverage, the partial *F*-statistics at the first stage is 21.81, higher than the critical value of 15.09 for four instruments (Stock et al. 2002). Moreover, the partial *R*-squared is 7%. After assessing the likelihood of the weak instruments problem, we provide diagnostic test results to further assess the validity of the instruments. Given that we have multiple instruments, we test for the validity of overidentifying restrictions to check the instruments' appropriateness. The *J*-test statistic for our main analysis of market leverage is 0.593 with a *p*-value of 0.898, which fails to reject AQPlease note the insertion of "hypothesis'' after "null'' here and throughout the text.the null hypothesis that the instruments are valid. Finally, we perform a Hausman test to check the endogeneity of the *DUAL* indicator. The results from the Hausman test reject the exogeneity of the *DUAL* indicator, suggesting that the IV results should be preferred to the OLS results. We perform and tabulate similar diagnostic tests in all our subsequent IV analyses.

4.4. Treatment Effects Model

The IV estimation assumes that the instruments are uncorrelated with the error term in the outcome equation, an assumption that cannot be verified, because the true error term is unobservable. To evaluate the robustness of our results, we also employ an alternative methodology. Specifically, we use the treatment effects model described in Maddala (1983) and Greene (2000), which differs from the IV estimation in terms of the assumption about the error term. Although the IV approach assumes that the instruments are uncorrelated with the error term, the treatment effects model uses instruments in the first stage to predict for the correlated component of the error term in the second-stage regression and directly controls for this component under the assumption that the errors in the first- and second-stage models are bivariate normal. Because both approaches have advantages and

[10] This approach requires that the instruments can be separated into two subgroups: (1) instruments that are likely to satisfy the exclusion restriction (i.e., that are valid instruments), and (2) instruments that are suspected to violate the exclusion restriction. Hayashi (2000, p. 220) offers a *C*-test statistic that allows testing of the validity of the second subset of instruments. Under the null hypotheses that all instruments are valid, the *C*-statistic, which follows chi-squared distribution, should not be statistically significant. To perform this test, we begin by selecting the instrument that we believe is most likely to satisfy the exclusion restriction. This instrument in our view is *FAMILY* (i.e., an indicator of whether the company's name includes the last name of its founder). We treat the remaining instruments as potential suspects to the validity threat. Subsequently, we run the IV analysis of the effect of the *DUAL* indicator on leverage (our broadest sample) to perform a *C*-test for each of the instruments in the suspect group. This allows us to determine which instruments may be invalid.

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disadvantages in practice, we verify the robustness of our results to using the treatment effects model. For this analysis, we continue to use the same set of instruments employed in our IV approach. The results using the treatment effects model are similar to those reported using the IV model and hence are not tabulated to preserve space. In sum, the results from the treatment effects model also indicate that dual class firms exhibit significantly higher book and market leverage.

4.5. Cross-Sectional Analysis

To provide further evidence on the bonding hypothesis, we conduct cross-sectional analyses within the dual class sample. We examine several situations when, arguably, dual class insiders have stronger incentives to bond due to either a higher level of agency costs (H2A) or the need to raise funds from equity markets in the presence of profitable investment opportunities (H2B). Table 5 presents the results of these cross-sectional tests. Panel A examines whether the wedge between voting and cash flow rights, a proxy for the extent of a conflict between shareholder classes, is positively related to leverage. Columns (1) and (2) report the results for market leverage and book leverage respectively. Consistent with H2A, we find positive and significant (at the 5% level) coefficients for the wedge between voting and cash flow rights for both market leverage and book leverage. An average increase in the wedge between voting and cash flow rights (i.e., an increase of 0.22) is associated with an increase of approximately 0.02 in both market and book leverage (i.e., approximately 10% of the mean market/book leverage). This suggests that insiders with greater voting power indeed employ higher levels of debt (holding cash flow rights constant).

Panel B of Table 5 examines whether firms with more profitable investment opportunities and those with a greater need to access equity markets use more debt (H2B). We measure the presence of profitable investment opportunities by the growth in sales revenues over the previous year, whereas the access to equity markets is measured by the indicator of secondary equity issuances in the prior or following five years (we use both the past and future equity issuances as proxies for the need to access equity markets for financing). Columns (1)–(3) of panel B report the results for market leverage, whereas columns (4)–(6) are based on book leverage. We find that the coefficient on sales growth is positive and significant for both market leverage and book leverage (at the 1% level in both cases). Dual class firms with an average revenue growth of 1.12 have a higher market (book) leverage of 0.03 (0.04), which corresponds to 44% (19%) of the mean leverage. Similarly, we find positive and statistically significant coefficients (at the 1% level for both market and book leverage for past equity issuances and at the 5% level for future equity issuances) for the two equity issuance indicators, suggesting that dual class firms that need to raise equity financing are more likely to bond using debt. Firms with an equity issuance in the past or future five years have a higher market leverage of 0.06 (36% of mean) and 0.02 (12% of the mean), respectively. Similarly, firms with an equity issuance in the past or future five years have a higher book leverage of 0.07 (33% of mean) and 0.03 (14% of the mean), respectively. Overall, the evidence is consistent with H2B. In essence, for these firms, the benefits of tapping the capital markets are more likely to outweigh the private benefits sacrificed as a result of bonding.

In sum, our results in this section indicate that dual class firms choose higher levels of debt, even after we account for endogeneity using several alternative methods (PSM, IV estimations, treatment effects models, and cross-sectional analyses), which is consistent with the bonding hypothesis.[11] The next section focuses on the specific disciplinary mechanisms associated with debt financing.

5. Debt Contracting Mechanisms

In this section, we consider several contracting mechanisms through which insiders in dual class firms can bond against self-serving actions. Similar to the

[11] We note that an alternative (albeit non-mutually exclusive) explanation for our results is that, relative to nondual class firms, dual class firms have cheaper access to debt and hence opt for more debt financing. We address this issue by conducting the following checks. First, we control for both the cost of debt and the cost of equity in addition to other factors in our analyses. This analysis holds the cost of equity and debt capital constant across the two types of firms and thus alleviates the concern that our findings are entirely driven by the differences in the cost of financing. We verify that the results hold after we control for the cost of capital. However, including these cost of capital controls results in a significant loss of sample observations (from 47,923 to 17,262 observations for the OLS regression on market leverage), so we do not include them in the main results. This analysis suggests that our findings are not likely to be entirely driven by the cheaper-access-to-debt explanation. Second, our cross-sectional tests suggest that dual class firms that access equity markets also have larger amounts of debt with greater frequency, which is more consistent with the bonding argument. Finally, in §6 we conduct several valuation analyses, the results of which are more consistent with a bonding story. Nevertheless, debt could be a cheaper source of financing relative to inferior class equity securities. We believe that this view does not contradict our arguments in the paper. Specifically, we argue that debt limits private consumption because debtholders are more protected against expropriation (the passive role of debt) and also proactively exercise control rights (the active role of debt). This benefits minority shareholders, whose interests overlap with those of debtholders. The reason that debt might be a cheaper source of financing (compared to outside equity) is precisely because debt limits the agency costs more effectively.

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Table 5 Dual Class Firms: Cross-Sectional Analyses on Leverage

Panel A: Agency problems		
	(1) *LEV_MKT*	(2) *LEV_BK*
WEDGE	0.066**	0.078**
	(1.99)	(2.09)
INSIDER_OWN	0.014	−0.000
	(0.48)	(0.00)
SIZE	−0.014***	−0.014**
	(2.73)	(2.39)
BTM	0.036***	−0.044***
	(2.61)	(2.96)
DIV	−0.502	−0.663
	(0.79)	(0.98)
ROA	−0.116**	−0.197***
	(2.39)	(3.23)
TANGIBILITY	0.185***	0.223***
	(3.28)	(3.26)
SG&A	−0.152***	−0.180***
	(5.25)	(4.83)
CAPEX	−0.390***	−0.397***
	(2.81)	(3.03)
REV_GROWTH	0.035***	0.049***
	(3.62)	(3.77)
R&D	−0.018	−0.049
	(0.19)	(0.51)
STD_RET	−0.504	−0.727
	(0.71)	(0.83)
BETA	0.019*	0.017
	(1.77)	(1.47)
FIRM_AGE	0.001	−0.001
	(0.09)	(0.05)
#SEGMENTS	0.005	0.004
	(1.03)	(0.75)
TAX CREDIT	−0.152**	−0.191**
	(2.18)	(2.29)
LOG#ANALYSTS	0.014*	0.013
	(1.90)	(1.63)
BASPREAD	−0.054	0.121
	(0.21)	(0.41)
STD_DA	−0.266*	−0.391**
	(1.72)	(2.24)
STD_ROA	−0.145**	−0.187**
	(2.16)	(2.06)
LOSS	0.058***	0.067***
	(2.86)	(3.00)
No. of observations	1,758	1,758
Adjusted *R*-squared	0.34	0.35

analysis in the previous section, we present results using a PSM analysis, as well as OLS and instrumental variable (IV) regressions, to alleviate endogeneity concerns.[12] The model specification in this subsection is as follows:

$$\begin{aligned} \textit{Dependent} = {} & \delta_0 + \delta_1 DUAL + \delta_2 LEV\_MKT + \delta_3 PROP\_SHORT \\ & + \delta_4 SIZE + \delta_5 BTM + \delta_6 ROA \\ & + \delta_7 ALTMAN\_ZSCORE + \delta_8 FIRM\_AGE \\ & + \delta_9 STD\_RET + \delta_{10} BA\_SPREAD + \delta_{11} STD\_DA \\ & + \delta_{12} STD\_ROA + \delta_{13} CONVERTIBLE \\ & + \delta_{14} SECURED\_DEBT + \delta_{15} LOAN\_SIZE \\ & + \delta_{16} MATURITY + \delta_{17} REVOLVER + \varepsilon, \end{aligned} \tag{3}$$

[12] We also conduct analyses using treatment effects models in which we instrument for *DUAL* using the same set of instrumental variables as in our prior analyses (Gompers et al. 2010). The results we obtain are qualitatively similar to those presented in the paper. For brevity, we do not tabulate these results; they are available upon request.

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Table 5 (Continued)

	Panel B: Need to access equity market					
	(1)	(2)	(3)	(4)	(5)	(6)
		LEV_MKT			*LEV_BK*	
REV_GROWTH	0.024***			0.032***		
	(2.81)			(2.87)		
PAST_EQUITY_ISSUANCE		0.057***			0.067***	
		(3.24)			(3.66)	
FUT_EQUITY_ISSUANCE			0.038**			0.048**
			(1.97)			(2.40)
SIZE	−0.015***	−0.014***	−0.015***	−0.014***	−0.013**	−0.014***
	(3.25)	(3.03)	(3.27)	(2.66)	(2.43)	(2.66)
BTM	0.026*	0.028**	0.028**	−0.055***	−0.054***	−0.054***
	(1.91)	(2.04)	(1.98)	(3.90)	(3.89)	(3.75)
DIV	−0.137	−0.177	−0.110	−0.081	−0.132	−0.050
	(0.35)	(0.46)	(0.29)	(0.17)	(0.28)	(0.11)
ROA	−0.109***	−0.104***	−0.104***	−0.166***	−0.159***	−0.159***
	(2.67)	(2.61)	(2.59)	(3.53)	(3.52)	(3.51)
TANGIBILITY	0.175***	0.176***	0.172***	0.222***	0.223***	0.218***
	(4.04)	(4.11)	(4.04)	(4.63)	(4.71)	(4.66)
SG&A	−0.176***	−0.182***	−0.184***	−0.208***	−0.215***	−0.218***
	(6.16)	(6.31)	(6.54)	(6.48)	(6.75)	(6.98)
CAPEX	−0.406***	−0.391***	−0.382***	−0.429***	−0.409***	−0.397***
	(4.00)	(3.81)	(3.89)	(4.21)	(3.94)	(3.97)
R&D	−0.046	−0.052	−0.051	−0.053	−0.061	−0.060
	(0.50)	(0.59)	(0.57)	(0.60)	(0.71)	(0.69)
STD_RET	0.010	0.067	0.032	−0.080	−0.008	−0.049
	(0.02)	(0.14)	(0.06)	(0.13)	(0.01)	(0.08)
BETA	0.020**	0.019**	0.020**	0.020**	0.020**	0.020**
	(2.32)	(2.31)	(2.41)	(2.04)	(2.02)	(2.12)
FIRM_AGE	0.009	0.010	0.008	0.008	0.010	0.008
	(0.89)	(1.06)	(0.84)	(0.76)	(0.90)	(0.68)
#SEGMENTS	0.005	0.005	0.005	0.004	0.004	0.004
	(1.55)	(1.50)	(1.58)	(1.17)	(1.12)	(1.20)
TAXCREDIT	−0.180***	−0.194***	−0.192***	−0.211***	−0.228***	−0.227***
	(3.34)	(3.75)	(3.76)	(3.40)	(3.86)	(3.90)
LOG#ANALYSTS	0.014**	0.011*	0.012*	0.013*	0.010	0.010
	(2.06)	(1.72)	(1.80)	(1.77)	(1.38)	(1.44)
BASPREAD	0.157	0.169	0.156	0.254	0.265	0.252
	(0.55)	(0.61)	(0.56)	(0.87)	(0.92)	(0.87)
STD_DA	−0.496***	−0.515***	−0.500***	−0.603***	−0.623***	−0.607***
	(3.80)	(4.05)	(3.91)	(4.16)	(4.37)	(4.22)
STD_ROA	−0.054	−0.046	−0.047	−0.075	−0.065	−0.066
	(1.36)	(1.21)	(1.23)	(1.51)	(1.37)	(1.39)
LOSS	0.036**	0.035**	0.035**	0.044***	0.043***	0.043***
	(2.48)	(2.42)	(2.42)	(2.79)	(2.73)	(2.72)
No. of observations	3,233	3,233	3,233	3,233	3,233	3,233
Adjusted *R*-squared	0.35	0.35	0.35	0.36	0.36	0.36

Notes. This table presents the results of the cross-sectional analyses of the relation between agency costs (panel A) and the need to access equity markets (panel B) and leverage within dual class firms. The dependent and independent variables are defined as follows (see Appendix A for detailed definitions and their sources). *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *LEV_BK* is the total debt held by the firm divided by the book value of assets of the firm; *WEDGE* is the difference between insider voting and cash flow rights; *REV_GROWTH* is the ratio of current year revenues to prior year revenues; *PAST_EQUITY_ISSUANCE* is an indicator variable that equals 1 if the firm had a secondary equity offering in the past 5 years, and 0 otherwise; *FUT_EQUITY_ISSUANCE* is an indicator variable that equals 1 if the firm had a secondary equity offering in the following 5 years, and 0 otherwise; *INSIDER_OWN* is the cash flow rights of controlling insiders in dual class firms; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *DIV* is the ratio of the common dividends declared divided by the market capitalization; *ROA* is income before extraordinary items divided by average total assets; *TANGIBILITY* is the ratio of total net PPE to total assets; *SG&A* is the ratio of selling, general, and administrative expenses to sales; *CAPEX* is the ratio of capital expenditures to sales; *R&D* is the ratio of research and development expenses to market capitalization; *STD_RET* is the variance of monthly stock returns over the prior year; *BETA* is calculated over the preceding year based on the correlation of daily stock returns with daily returns on an equally weighted market index; *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *#SEGMENTS* is an indicator variable that equals 1 when the firm has more than one Compustat business segment during the fiscal year, and 0 otherwise; *TAXCREDIT* is an indicator variable that equals 1 when an investment tax credit is present, and 0 otherwise; *LOG#ANALYSTS* is the logarithm of 1 plus the number of analysts following the firm; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *LOSS* is a dummy variable that equals 1 if net income is negative. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics in parentheses are based on robust standard errors double clustered by firm and year.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

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where *Dependent* represents a contracting mechanism (e.g., covenants), and other variables are as defined in Appendix A. We use a comprehensive set of control variables motivated by prior studies, including Billett et al. (2007), Chava et al. (2010), and Christensen and Nikolaev (2012). The propensity score matching (PSM) is carried out based on the control variables in Equation (3).

Although controlling for leverage (to the extent that it is a manifestation of bonding) reduces the likelihood of finding an effect, we follow a more conservative approach and include market leverage as a control variable (because it is likely to correlate with debt contracting mechanisms of interests, e.g., covenants). A related concern here is that the level of debt, debt covenants, or other debt contracting characteristics are determined simultaneously. To address this issue, a set of determinants of leverage is required that do not directly affect the use of covenants (or the other debt contracting mechanisms). To verify the robustness of our results, we employ a simultaneous equation model similar to that in Billett et al. (2007), which allows for the endogenous effect of leverage. Specifically, we use the investment tax credit as an instrument for leverage; this variable is likely to affect the level of debt but is not expected to be directly associated with specific debt contracting mechanisms. We continue to use instruments based on Gompers et al. (2010) to account for the endogenous nature of the *DUAL* indicator. Note that when we present the simultaneous equation results, we only tabulate the results of the model explaining debt contracting mechanisms; for parsimony, we omit the results for the leverage and the *DUAL* indicator equations.

5.1. Private Debt and Lending Relationships

Recall that H3A and H3B predict that dual class companies rely on private debt and relationship lending more frequently. First, we examine differences in private debt between dual class and single class firms. We measure *PVT_DEBT* as an indicator variable that equals 1 if the firm has private debt outstanding during the year, and 0 otherwise. We compare *PVT_DEBT* between the sample of dual class firms and a PSM sample of single class firms, where the matching is done on firm characteristics in Equation (3). Subsequently, we use the private debt indicator as the dependent variable in Equation (3) and perform regression analyses.

Panel A of Table 6 presents the results of the PSM analysis, whereas panel B presents the results of the OLS and IV analyses. The results are consistent across all three econometric methods and indicate that dual class firms are significantly more likely than single class firms to rely on private debt. Specifically, panel A indicates that the difference between *PVT_DEBT* for dual class (0.73) and a matched sample of single class (0.67) firms is significant at the 1% level (with a *t*-statistic of 3.24). Panel B shows that both the OLS and IV analyses yield positive and statistically significant (at the 1% level) coefficients on *DUAL*. The results indicate that dual class firms are 6% (OLS analysis) and 4% (IV analysis) more likely to have private debt (versus single class firms).[13]

Table 6 also examines the differences in the relationship lending indicator between dual class and single class firms. For loan *i*, we search all loans by the same borrower over the previous five years of data available on DealScan. If the lead bank for loan *i* is the same as the lead bank on prior loans, we classify loan *i* as a relationship loan (Bharath et al. 2011). *REL_BANK* is an indicator variable that takes the value of 1 if a loan is classified as a relationship loan, and 0 otherwise. It is used as the dependent variable in model (3) and as the outcome variable in the PSM analysis. The PSM analysis in panel A indicates no significant differences in the presence of relationship loans between dual class firms and a matched sample of single class firms, although the dual class firms show a higher likelihood of relationship loans.[14] The OLS results in panel B indicate a positive but insignificant coefficient on the dual indicator. However, the IV analysis yields a positive and statistically significant (at the 5% level) coefficient on *DUAL*, suggesting that, after controlling for endogeneity, dual class firms are 9% more likely to exhibit lending relationships than are single class firms. Note that the Hausman test rejects the exogeneity of the *DUAL* indicator ($F = 10.15$ with a p-value of 0.0062), suggesting that the IV results are preferable to the OLS results. Collectively, the evidence in this subsection provides support to Hypotheses H3A and H3B.

5.2. Debt Contracting Mechanisms: Covenants

Next, we examine the differences in the design of covenant packages between dual and single class

[13] We note that, for the private debt analyses, the overidentification tests reject the hypothesis that the instruments are exogenous as a group. Therefore, the results for the IV estimation should be interpreted with caution. However, the results using the other econometric techniques are in line with those we obtain using IV, and capital markets react positively to private debt issuances by dual class firms (see §6). Collectively these results give us more confidence in our conclusions on the role of private debt in dual class companies.

[14] The mean of *REL_BANK* is higher than the mean of *PVT_DEBT* because we have a smaller sample for the relationship lending analyses: we only consider the sample of firms with outstanding private debt and look within those firms to identify firms with relationship lending. If we considered these firms with no outstanding private debt as those without relationship lending, the mean of *REL_BANK* would be 0.28 for dual class firms and 0.23 for single class firms, which is significantly lower than the mean of *PVT_DEBT*.

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Table 6 Dual Class Firms, Private Loans, and Relationship Loans

Panel A: Propensity score matching analyses

Variable	Sample	Dual	Single	Diff.	*t*-statistic
PVT_DEBT	Unmatched	0.727	0.588	0.139	14.7***
	Matched	0.727	0.669	0.058	3.24***
REL_BANK	Unmatched	0.760	0.745	0.015	1.09
	Matched	0.760	0.743	0.017	1.18

Panel B: Regression analyses of private loans and relationship loans

	(1) *PVT_DEBT* OLS	(2) *PVT_DEBT* IV	(3) *REL_BANK* OLS	(4) *REL_BANK* IV
DUAL	0.060***	0.419***	0.008	0.092**
	(3.78)	(4.80)	(0.50)	(2.21)
LEV_MKT	0.861***	−2.091***	0.116***	−1.401**
	(22.26)	(4.92)	(3.45)	(2.06)
PROP_SHORT	−0.000	−0.006	−0.058***	−0.159***
	(0.51)	(1.06)	(3.28)	(3.54)
SIZE	0.069***	0.080***	0.080***	0.064***
	(13.84)	(12.07)	(11.78)	(8.48)
BTM	0.024***	0.217***	0.051***	0.114***
	(2.78)	(6.20)	(4.47)	(3.06)
ROA	0.265***	0.418***	0.006	0.290*
	(11.60)	(9.16)	(0.10)	(1.81)
ALTMAN_ZSCORE	−0.009***	−0.033***	−0.009***	−0.068**
	(10.12)	(7.87)	(3.48)	(2.40)
FIRM_AGE	0.014	−0.003	0.019***	−0.003
	(1.09)	(0.19)	(2.99)	(0.23)
STD_RET	0.348	−1.138*	−1.265***	−0.859
	(1.06)	(1.66)	(2.68)	(1.55)
BASPREAD	−0.840***	0.123	−1.209***	−1.407***
	(3.04)	(0.26)	(2.66)	(2.92)
STD_DA	−0.018	−1.395***	−0.294***	−0.612***
	(0.16)	(6.28)	(2.62)	(2.76)
STD_ROA	−0.122***	−0.187***	−0.270***	−0.412***
	(5.35)	(5.25)	(2.66)	(2.92)
CONVERTIBLE	−0.078***	0.095***	−0.038***	−0.008
	(6.97)	(2.66)	(3.72)	(0.33)
SECURED			−0.005	0.011
			(0.31)	(0.61)
LOAN_SIZE			0.349***	0.434***
			(10.83)	(9.28)
MATURITY			−0.053***	−0.023
			(4.40)	(1.13)

firms. Recall that our hypothesis H4A predicts that the debt contracts of dual class firms are more likely to contain cash sweep covenants than those of single class firms. We consider the presence of the following cash sweep covenants that are likely to benefit minority shareholders by preventing insiders from misusing excess cash (measured by using indicator variables): (1) excess cash flows sweep (*EXCESS_CF*) and (2) asset sales sweep (*ASSET_SALE*). These covenants control part of cash flows by requiring that a part (or all) of excess cash flows or the cash flows from the sales of assets be used toward repaying the outstanding loan balance.[15] We also use the count of these cash sweeps as a summary proxy for their use (*SWEEPS*).

Panel A of Table 7 presents the results of the PSM analysis. We find that loans issued to dual class firms are significantly more likely to have cash sweeps compared to the matched sample of loans issued to single class firms (*EXCESS_CF*: 0.28 versus

[15] We focus on these two cash sweeps because they are more relevant for minority shareholders. We obtain similar results when we consider other sweep covenants, including debt issue sweeps, equity issue sweeps, and insurance proceeds sweeps.

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Table 6 (Continued)

Panel B: Regression analyses of private loans and relationship loans (continued)

	(1) *PVT_DEBT* OLS	(2) *PVT_DEBT* IV	(3) *REL_BANK* OLS	(4) *REL_BANK* IV
REVOLVER			0.140***	0.085***
			(6.60)	(2.85)
Constant	0.074	0.529***	0.229***	0.766***
	(1.26)	(4.35)	(3.96)	(3.50)
No. of observations	40,119	34,138	12,452	10,619
Adjusted R-squared	0.23		0.16	
Partial R-squared		0.0787		0.1359
Partial F-statistic		$F_p = 23.13$		$F_p = 17.54$
		$(p = 0.0000)$		$(p = 0.0000)$
Overidentifying restriction		$\chi 2 = 8.104$		$\chi 2 = 3.980$
		$(p = 0.0439)$		$(p = 0.2636)$
Hausman test		$F = 80.0932$		$F = 10.1555$
		$(p = 0.0000)$		$(p = 0.0000)$

Notes. Panel A presents the results for the differences in private debt and relationship lending for dual class firms versus both the unmatched and propensity score matched samples of single class firms. Each dual class firm-year observation is matched with a single class firm-year observation based on the propensity score (the estimated probability of dual class membership) using the nearest-neighbor estimator (we use $n = 30$ and verify robustness of the results to $n = 10$ and $n = 50$). The outcome variables are as follows. *PVT_DEBT* is a dummy variable that equals 1 if the firm has a bank loan contract that year, and 0 otherwise; *REL_BANK* is a dummy variable that equals 1 if there was prior lending by the same lender in the past, and 0 otherwise. Propensity score matching for private debt is carried out based on the following observable covariates: *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible. In addition to these variables, propensity score matching for relationship lending also includes the following variables: *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal package. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The t-statistics for the matched comparison are based on bootstrapped standard errors.

Panel B presents the results on the association between private debt/relationship lending and dual class ownership using the OLS and simultaneous equations regressions. Note that, for brevity, only the results of the model explaining private debt/relationship lending are presented for the simultaneous equations regression. The dependent and independent variables are defined as follows (see Appendix A for detailed definitions and their sources). *PVT_DEBT* is a dummy variable that equals 1 if the firm has a bank loan contract that year, and 0 otherwise; *REL_BANK* is a dummy variable that equals 1 if there was prior lending by the same lender in the past, and 0 otherwise; *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal package. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The t-statistics in parentheses are based on robust standard errors double clustered by firm and year.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

0.22, t-statistic= 3.66; *ASSET_SALE*: 0.35 versus 0.29, t-statistic = 3.77; and *SWEEPS*: 0.63 versus 0.51, t-statistic = 3.89). The results of the OLS and IV analyses are consistent with those of the PSM analysis. For brevity, we only present the regression results for *SWEEPS*. Panel B of Table 7 indicates a positive and statistically significant coefficient for *DUAL* (at the 1% level for OLS and 5% level for IV), suggesting that dual class firms are more likely to use cash sweeps as part of their debt contracts. Specifically, dual class firms have an approximately 23% higher likelihood of having a cash sweep relative to the sample average. The results are consistent with dual class firms subjecting themselves to more stringent constraints over cash inflows, in line with H4A and the bonding role of debt.

To examine the financial covenants, we follow Christensen and Nikolaev (2012) in separating them into two broad categories: (1) performance-based covenants (*P_COVENANTS*), which is the number of

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Table 7 Dual Class Firms and Cash Sweeps in Private Loan Contracts

Panel A: Propensity score matching analysis

Variable	Sample	Dual	Single	Diff.	*t*-statistic
EXCESS_CF	Unmatched	0.278	0.191	0.087	7.39***
	Matched	0.279	0.219	0.060	3.66***
ASSET_SALES	Unmatched	0.352	0.253	0.099	7.60***
	Matched	0.352	0.286	0.066	3.77***
SWEEPS	Unmatched	0.630	0.444	0.186	7.86***
	Matched	0.630	0.505	0.125	3.89***

Panel B: Regression analysis of cash sweeps

	(1) *SWEEPS* OLS	(2) *SWEEPS* IV
DUAL	0.131***	0.143**
	(4.32)	(2.20)
LEV_MKT	0.571***	−0.493
	(7.41)	(0.79)
PROP_SHORT	−0.121***	−0.211***
	(3.91)	(4.37)
SIZE	0.021**	0.012
	(2.54)	(1.36)
BTM	−0.060***	−0.011
	(3.98)	(0.27)
ROA	0.109*	0.318***
	(1.71)	(2.73)
ALTMAN_ZSCORE	0.001	−0.038*
	(0.24)	(1.67)
FIRM_AGE	−0.027*	−0.037***
	(1.94)	(2.87)
STD_RET	−4.075**	−4.283***
	(2.02)	(3.07)
BASPREAD	1.620	1.942*
	(1.22)	(1.67)
STD_DA	0.338	−0.028
	(0.96)	(0.10)
STD_ROA	−0.186*	−0.214**
	(1.76)	(2.39)
CONVERTIBLE	0.001	0.028
	(0.05)	(0.89)
SECURED	0.441***	0.479***
	(13.60)	(16.94)
LOAN_SIZE	0.822***	0.850***
	(13.42)	(13.10)
MATURITY	0.050***	0.072***
	(2.96)	(4.02)

covenants that rely on income statement information; and (2) capital-based covenants (*C_COVENANTS*), which is the number of covenants that rely on information about the sources and uses of capital (i.e., balance sheet information only). Recall that H4B and H4C predict that dual class firms rely more on performance covenants and less on capital covenants.

Panel A of Table 8 presents the results of the PSM analysis of performance versus capital covenants. We find that loans issued to dual class companies have, on average, 1.98 performance covenants, compared to 1.62 such covenants in the matched sample of loans issued to single class companies. In contrast, loans issued to dual class companies have, on average, 0.36 capital covenants, compared to 0.46 in the matched sample of loans issued to single class companies. The differences are statistically significant at the 1% levels with corresponding *t*-statistics for the performance and capital covenants of 5.97 and −3.29.

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Table 7 (Continued)

Panel B: Regression analysis of cash sweeps (continued)

	(1) *SWEEPS* OLS	(2) *SWEEPS* IV
REVOLVER	0.096	0.040
	(1.51)	(0.77)
Constant	−0.175	0.170
	(1.48)	(0.75)
No. of observations	15,236	13,002
Adjusted *R*-squared	0.18	
Partial *R*-squared		0.1131
Partial *F*-statistic		$F_p = 18.31$
		($p = 0.0000$)
Overidentifying restriction		$\chi 2 = 1.333$
		($p = 0.7212$)
Hausman test		$F = 1.35924$
		($p = 0.5068$)

Notes. Panel A presents the results for the differences in various cash sweeps covenants for dual class firms versus both the unmatched and propensity score matched samples of single class firms. Each dual class firm-year observation is matched with a single class firm-year observation based on the propensity score (the estimated probability of dual class membership) using the nearest-neighbor estimator (we use $n = 30$ and verify robustness of the results to $n = 10$ and $n = 50$). The outcome variables are as follows. *EXCESS_CF* is an indicator variable that equals 1 when a sweep on the distributions of excess cash flows is included in a credit agreement, and 0 otherwise; *ASSET_SALES* is an indicator variable that equals 1 when a cash sweep on asset sales is included in a credit agreement, and 0 otherwise; *SWEEPS* is a count of sweeps-type covenants including asset sales sweeps and excess cash flow sweeps. Propensity score matching is carried out based on the following observable covariates. *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; and *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics for the matched comparison are based on bootstrapped standard errors.

Panel B presents the results on the association between sweeps-type covenants and dual class ownership using the OLS and simultaneous equations regressions. Note that, for brevity, only the results of the model explaining sweeps-type covenants are presented for the simultaneous equations regression. The dependent and independent variables are defined as follows (see Appendix A for detailed definitions and their sources). *SWEEPS* is a count of sweeps-type covenants including asset sales sweeps and excess cash flow sweeps; *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; and *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics in parentheses are based on robust standard errors double clustered by firm and year.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

Panel B of Table 8 indicates that OLS and IV analyses generate similar inferences. Columns (1) and (2) report the results for performance covenants. We find positive and significant coefficients (at the 1% level) on the *DUAL* indicator, suggesting that loans issued to dual class firms have more performance-based covenants, relative to those of single class firms. The IV analysis indicates that dual class firms have approximately 74% more performance-based covenants than the sample average. The results for capital covenants are reported in columns (3) and (4). We find negative and significant coefficients (at the 1% level) on the *DUAL* indicator, suggesting that loans issued to dual class firms have fewer covenants (in fact, approximately 200% fewer than sample average based on the IV analysis) formulated in terms of balance sheet information, relative to loans issued to single class firms. This evidence is consistent with our arguments that performance-based covenants will be used more extensively by dual class firms and that

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Table 8 Dual Class Firms and Financial Covenants in Private Loan Contracts

Panel A: Propensity score matching analysis

Variable	Sample	Dual	Single	Diff	*t*-statistic
P_COVENANTS	Unmatched	1.975	1.564	0.410	10.99***
	Matched	1.975	1.622	0.352	5.97***
C_COVENANTS	Unmatched	0.358	0.514	−0.156	−6.25***
	Matched	0.358	0.455	−0.096	−3.29***

Panel B: Regression analyses of financial covenants

	(1) *P_COVENANTS* OLS	(2) *P_COVENANTS* IV	(3) *C_COVENANTS* OLS	(4) *C_COVENANTS* IV
DUAL	0.325***	1.464***	−0.088***	−0.714***
	(6.06)	(5.68)	(3.04)	(4.72)
LEV_MKT	0.977***	−7.628***	−0.361***	4.657***
	(5.95)	(2.89)	(3.13)	(2.90)
PROP_SHORT	0.137***	−0.402***	−0.055*	0.230**
	(4.56)	(2.58)	(1.86)	(2.28)
SIZE	−0.029	−0.040	−0.049**	−0.047**
	(1.38)	(1.55)	(2.29)	(2.12)
BTM	−0.079***	0.329**	−0.012	−0.246***
	(2.61)	(2.41)	(0.40)	(2.91)
ROA	0.714***	2.472***	−0.073	−1.104***
	(3.24)	(4.08)	(0.65)	(2.98)
ALTMAN_ZSCORE	−0.009	−0.311***	0.021***	0.195***
	(0.80)	(3.23)	(3.35)	(3.48)
FIRM_AGE	−0.165***	−0.263***	0.009	0.054*
	(8.59)	(5.51)	(0.55)	(1.80)
STD_RET	−0.985	1.925	−1.863	−3.361**
	(0.62)	(1.23)	(1.24)	(2.55)
BASPREAD	−6.952***	−5.507***	5.846***	4.827**
	(5.32)	(2.62)	(3.67)	(2.56)
STD_DA	0.333	−1.831*	−0.015	1.471**
	(0.65)	(1.89)	(0.08)	(2.15)
STD_ROA	−0.623***	−1.303***	0.090	0.493***
	(3.36)	(4.64)	(0.75)	(3.62)
CONVERTIBLE	0.073*	0.277***	0.027	−0.077
	(1.77)	(2.60)	(0.94)	(1.22)
SECURED	0.317***	0.549***	−0.125***	−0.265***
	(8.23)	(7.99)	(5.63)	(5.42)
LOAN_SIZE	0.545***	1.079***	−0.332***	−0.638***
	(6.73)	(4.38)	(5.38)	(4.47)
MATURITY	0.237***	0.366***	−0.129***	−0.206***
	(10.39)	(5.22)	(6.72)	(4.43)

capital-based covenants are less likely to be effective disciplining mechanisms in dual class companies.

Overall, the evidence on the use of private debt, lending relationships, and debt covenants indicates that dual class firms opt for greater scrutiny from lenders than single class firms do, and that this outcome holds after the endogeneity is addressed in several different ways. These findings are consistent with debt contracts serving as a governance mechanism through which insiders in dual class companies bond against expropriating value from minority shareholders.

6. Capital Market Outcomes of Debt Financing in Dual Class Firms

6.1. Market Reactions to Private Loan Issuances

To test the bonding hypothesis from a different angle, we examine market reactions to private debt issuances by dual class firms using an event study

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Table 8 (Continued)

Panel B: Regression analyses of financial covenants (continued)

	(1) *P_COVENANTS* OLS	(2) *P_COVENANTS* IV	(3) *C_COVENANTS* OLS	(4) *C_COVENANTS* IV
REVOLVER	0.107**	−0.095	−0.042	0.082
	(2.49)	(0.92)	(1.63)	(1.29)
Constant	0.893***	3.055***	1.432***	0.234
	(3.60)	(4.10)	(5.66)	(0.48)
No. of observations	8,030	6,849	8,030	6,849
Adjusted R-squared	0.2046		0.1259	
Partial R-squared		0.1258		0.1234
Partial F-statistic		$F_p = 20.92$		$F_p = 20.92$
		$(p = 0.0000)$		$(p = 0.0000)$
Overidentifying restriction		$\chi 2 = 3.146$		$\chi 2 = 1.186$
		$(p = 0.3696)$		$(p = 0.7563)$
Hausman test		$F = 47.3435$		$F = 52.3452$
		$(p = 0.0000)$		$(p = 0.0000)$

Notes. Panel A presents the results for the differences in the types of financial covenants for dual class firms versus both the unmatched and propensity score matched samples of single class firms. Each dual class firm-year observation is matched with a single class firm-year observation based on the propensity score (the estimated probability of dual class membership) using the nearest-neighbor estimator (we use $n = 30$ and verify robustness of the results to $n = 10$ and $n = 50$). The outcome variables are as follows. *P_COVENANTS* is the number of performance-based covenants, where the covenant benchmarks include (1) the cash interest coverage ratio, (2) the debt service coverage ratio, (3) the level of earnings before interest, taxation, depreciation, and amortization (EBITDA), (4) the fixed charge coverage ratio, (5) the interest coverage ratio, (6) debt to EBITDA, and (7) senior debt to EBITDA. *C_COVENANTS* is the number of capital-based covenants, where the covenant benchmarks include the (1) quick ratio, (2) current ratio, (3) debt-to-equity ratio, (4) loan-to-value ratio, (5) debt-to-tangible-net-worth ratio, (6) leverage ratio, and (7) the senior leverage ratio. Propensity score matching is carried out based on the following observable covariates. *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The t-statistics for the matched comparison are based on bootstrapped standard errors.

Panel B presents the results on the association between types of financial covenants and dual class ownership using the OLS and simultaneous equations regressions. Note that, for brevity, only the results of the model explaining types of financial covenants are presented for the simultaneous equations regression. The dependent and independent variables are defined as follows (see Appendix A for detailed definitions and their sources). *P_COVENANTS* is the number of performance-based covenants, where the covenant benchmarks include (1) the cash interest coverage ratio, (2) the debt service coverage ratio, (3) the level of EBITDA, (4) the fixed charge coverage ratio, (5) the interest coverage ratio, (6) debt to EBITDA, and (7) senior debt to EBITDA. *C_COVENANTS* is the number of capital-based covenants, where the covenant benchmarks include the (1) quick ratio, (2) current ratio, (3) debt-to-equity ratio, (4) loan-to-value ratio, (5) debt-to-tangible-net-worth ratio, (6) leverage ratio, and (7) the senior leverage ratio. *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; and *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The t-statistics in parentheses are based on robust standard errors double clustered by firm and year.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

methodology. To the extent that private debt helps to discipline insiders in dual class firms and creates value for minority shareholders, we expect that stock markets will exhibit a positive reaction to the issuance of private debt by dual class firms. Such an analysis allows us to isolate the effect of an incremental private debt offering decision on shareholder valuation and to demonstrate the bonding role of private debt more directly.

To perform this test, we use as our event dates the dates when the private debt contracts were entered into (we refer to this as the loan "issue date"), available

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on DealScan. Generally, private debt issuances are not announced before the deal is signed and are not known by the market. The SEC requires mandatory disclosure of material contractual agreements, including debt contracts, within five business days after a contract is entered into. Thus, we consider the average daily cumulative abnormal returns (CARs) over a 7-day event window that includes the day before the issuance date, the issuance date, and five subsequent trading days. In addition to a 7-day window, we also consider a 15-day event window to capture any delay in the loan issuance news being incorporated in prices. We conduct the following OLS regression:

$$\begin{aligned} CAR = {} & \delta_0 + \delta_1 INFERIOR + \delta_2 SUPERIOR \\ & + \delta_3 LEV\_MKT + \delta_4 PROP\_SHORT + \delta_5 SIZE \\ & + \delta_6 BTM + \delta_7 ROA + \delta_8 ALTMAN\_ZSCORE \\ & + \delta_9 FIRM\_AGE + \delta_{10} STD\_RET \\ & + \delta_{11} BASPREAD + \delta_{12} STD\_DA + \delta_{13} STD\_ROA \\ & + \delta_{14} CONVERTIBLE + \delta_{15} SECURED \\ & + \delta_{16} LOAN\_SIZE + \delta_{17} MATURITY \\ & + \delta_{18} REVOLVER + \varepsilon, \end{aligned} \tag{4}$$

where *CAR* is the daily cumulative abnormal returns over the event window. The variables *INFERIOR* and *SUPERIOR* are indicator variables representing the types of a traded dual class share. The variable *INFERIOR* allows us to better capture whether debt provides a governance role and adds value for minority shareholders. Our model specification and all other variables in Equation (4) are as defined in prior sections.

We expect that, if private debt protects minority investors from expropriation by insiders, then private debt issuances by dual class firms (more specifically, the inferior dual class shares) should elicit a stronger positive response than the corresponding issuances by a sample of single class firms. Therefore, we expect the coefficient on *INFERIOR* (δ_1) to be significantly positive. Further, within the dual class sample, we expect inferior dual class shares to elicit a stronger market response than superior dual class shares. We conduct OLS regressions and propensity score matched designs to test the above assertions.

Table 9 presents the results. Panel A presents summary statistics of the average daily and annualized CARs. For both the 7-day and 15-day windows, we find that private loan issuances by dual class firms earn higher event window returns compared to the corresponding returns of single class firms. For instance, for the 7-day (15-day) window, dual class firms earn 123 basis points, which translates into a 64% return on an annual basis (150 basis points, or a 78% return on an annual basis) from private loan issuances, whereas single class firms earn 75 basis points (114 basis points). Similarly, within dual class firms, for the 7-day (15-day) window, inferior dual class shares earn 135 basis points (176 basis points) average CARs from private loan issuances, whereas superior dual class shares earn 71 basis points (41 basis points). These univariate findings reveal economically considerable magnitudes; the results are consistent with our predictions on the disciplining role of private debt.

The results of our regression analyses lend further support to the above findings (the results are similar for the 7-day and 15-day returns; for brevity, we only discuss the former). Panel B of Table 9 presents the OLS results corresponding to model (4) for the sample of single and dual class firms. Columns (1) and (2) present the results without any control variables, and columns (3) and (4) present the results of the full model including all controls. We find positive and statistically significant coefficients for *INFERIOR* across all columns (significant at the 5% level or less), whereas the coefficients corresponding to *SUPERIOR* are not significant, supporting the notion that debt issuances create value for minority shareholders. Columns (3) and (4) indicate that the inferior shares earn 0.88% (1.02%) higher 7-day (15-day) returns following debt issuances relative to single class firms. The comparisons of inferior and superior dual class shares with the propensity score matched sample of single class shares (Table 9, panel C) also support the OLS findings. Inferior dual class shares earn 0.88% higher average event window CARs compared to the propensity score matched sample of single class shares (the difference is significant at the 1% level). In contrast, the average CARs earned by superior dual class shares within the event window are not significantly different from those earned by single class shares.

Overall, the results on private debt issuances are consistent with the governance role of debt and of private debt in particular. Further, the fact that private debt issuances add value to the inferior class shares rather than the superior class shares strengthens the inference that debt enhances the value of dual class firms by lowering agency costs related to the disproportional control rights in dual class structures.

6.2. Market Valuation and Voting Premiums

To further corroborate our inferences on the disciplinary role of debt, we examine whether dual class firms with higher levels of debt financing obtain more favorable market valuations. First, we examine whether leverage can attenuate the negative association between the agency conflicts present within dual class ownership structures and Tobin's q, a proxy for

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Table 9 Market Reactions to Private Loan Issuances

Panel A: Summary statistics

	DUAL = 0	*DUAL* = 1	*DUAL* = 1	
			Superior class	Inferior class
7-day return × 100%	0.753	1.227	0.712	1.352
Annualized 7-day return × 100%	39.179	63.793	37.006	70.279
No. of observations	20,860	2,237	436	1,801
15-day return × 100%	1.138	1.495	0.410	1.758
Annualized 15-day return × 100%	59.165	77.765	21.330	91.427
No. of observations	20,860	2,237	436	1,801

Panel B: Full sample regression analysis

		OLS			
		(1) 7-day return	(2) 15-day return	(3) 7-day return	(4) 15-day return
Inferior	Coeff × 100%	0.598**	0.620**	0.878***	1.022***
	t-value	(2.65)	(2.13)	(3.58)	(3.19)
	p-value	0.008	0.033	0.000	0.001
Superior	Coeff × 100%	−0.042	−0.728	0.280	0.182
	t-value	(−0.09)	(−1.32)	(0.55)	(0.30)
	p-value	0.931	0.188	0.584	0.763
Control variables		—	—	Yes	Yes
No. of observations		23,097	23,097	17,254	17,254

Panel C: Propensity score matching: Full sample

	Inferior vs. single class		Superior vs. single class	
	7-day return	15-day return	7-day return	15-day return
Coeff×100%	0.879***	1.086**	0.290	0.246
t-value	(3.32)	(3.01)	(0.47)	(0.35)
p-value	0.001	0.003	0.641	0.641

Notes. This table presents the analyses on the capital market reactions to private debt issuances by dual class firms. Panel A presents summary statistics for the average daily and annualized cumulative abnormal returns for dual and single class firms. Panel B presents the results of the OLS regression on the association between the average daily cumulative abnormal returns over 7-day and 15-day windows around private debt issuances for the sample of dual and single class firms. *INFERIOR* is a dummy variable that equals 1 if the dual class share has inferior voting rights, and 0 otherwise; *SUPERIOR* is a dummy variable that equals 1 if the dual class share has superior voting rights, and 0 otherwise. The (unreported) control variables in the model are defined as follows (see Appendix A for detailed definitions and their sources). *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_SHORT* is the fraction of a firm's total debt that matures in 3 years or less; *SIZE* is the natural logarithm of market capitalization; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets; *ALTMAN_ZSCORE* is the probability of bankruptcy calculated based on the model in Hillegeist et al. (2004); *FIRM_AGE* is the number of years since the year the firm first appeared in Compustat; *STD_RET* is the variance of monthly stock returns over the prior year; *BASPREAD* is the average bid–ask spread calculated over the previous year; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002); *STD_ROA* is the standard deviation of the return on assets; *CONVERTIBLE* is a dummy variable that equals 1 if a loan is convertible; *SECURED* is a dummy variable that equals 1 if a loan is secured; *LOAN_SIZE* is the ratio of loan size to total assets; *MATURITY* is the logarithm of the maturity of the facility, measured in months; and *REVOLVER* is a dummy variable that equals 1 if a revolving facility exists in the deal. Panel C presents the comparison of the 7-day and 15-day returns of inferior and superior dual class shares with a propensity score matched sample of single class shares (the propensity score matching is done using the same variables as in our earlier analyses). The *t*-statistics in parentheses are based on robust standard errors clustered by firm.

*Significant at the 10% level; **significant at the 5% level; ***significant at the 1% level.

firm value or asset productivity. We estimate the following regression for the subsamples of firms with high leverage and low leverage:

$$\begin{aligned} TOBIN'S\_Q &= \alpha_0 + \alpha_1 DUAL + \alpha_2 SIZE + \alpha_3 DIV + \alpha_4 ROA \\ &\quad + \alpha_5 TANGIBILITY + \alpha_6 SG\&A + \alpha_7 CAPEX \\ &\quad + \alpha_8 REV\_GROWTH + \alpha_9 R\&D + \alpha_{10} STD\_RET \\ &\quad + \alpha_{11} BETA + \alpha_{12} FIRM\_AGE + \alpha_{13} \#SEGMENTS \\ &\quad + \alpha_{14} TAX\_CREDIT + \alpha_{15} LOG\#ANALYSTS \\ &\quad + \alpha_{16} BASPREAD + \alpha_{17} STD\_DA \\ &\quad + \alpha_{18} STD\_ROA + \alpha_{19} LOSS + \varepsilon, \end{aligned} \tag{5}$$

where *TOBIN'S_Q* is measured as the ratio of the market value of assets to the book value of assets, and

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DUAL is the indicator variable for dual class firms.[16] Alternatively, we measure Tobin's q as the ratio of the market value of equity to the book value of equity, or market to book (observations with negative book values of equity are excluded from the analysis). The regression model is based on Gompers et al. (2010). Note that, although we interpret Tobin's q as a valuation measure for the assets in place, the numerator of Tobin's q likely reflects the capitalized value of growth options. We partition the sample firms into high- and low-leverage subsamples based on the median values of market leverage (using book leverage generates similar results). For each subsample, we run OLS and IV analyses where we regress Tobin's q on its determinants and the *DUAL* indicator. H5B predicts a less negative coefficient on *DUAL* in the subsample of high-leverage firms relative to the subsample of low-leverage firms.

Panel A of Table 10 presents the results of this analysis. Both OLS and IV tests indicate a negative and statistically significant coefficient on *DUAL* for the full sample and the low-leverage subsample. These results are consistent with the evidence in Gompers et al. (2010) that dual class firms have lower valuations on average. On the other hand, the results based on the OLS analysis indicate that the coefficient on *DUAL* for the high-leverage subsample, although negative, is only one-third the magnitude of that for the low-leverage subsample; the difference on *DUAL* between the two subsamples is statistically significant at the 1% level. Moreover, this effect becomes positive in the IV regressions although it is not statistically significant.[17] Overall, this analysis suggests that the negative effect of dual class ownership on Tobin's q is attenuated and ultimately reversed by a dual class firm's level of debt.

Our last set of tests examines the effect of leverage on the voting premium of dual class firms (H5C) by estimating the following regression (Zingales 1995):

$$\begin{aligned} &VOTING\_PREMIUM \\ &\quad = \alpha_0 + \alpha_1 LEV\_MKT + \alpha_2 PROP\_VOTESHR \\ &\qquad + \alpha_2 SIZE + \alpha_3 BTM + \alpha_4 ROA + \varepsilon, \end{aligned} \tag{6}$$

where *VOTING_PREMIUM* is calculated as $(P_A - P_B)/(P_B - rP_A)$.P_A is the price of superior voting shares, P_B is the price of inferior voting shares, and r is the relative number of votes of an inferior share versus a superior share. Then, the price of a voting right is given by $(P_A - P_B)/(1 - r)$, and the price of a cash flow right is given by $(P_B - rP_A)/(1 - r)$. The voting premium is the ratio of these two prices. The variable *PROP_VOTESHR* is the proportional voting share in a firm that serves as proxy for the ownership structure of the firm. The proportional voting share is calculated as the ratio between the total normalized number of votes (obtained by attributing one vote to each superior voting share and r of a vote to each inferior voting share) and the total number of outstanding shares. As in Zingales (1995), we include the variables measuring firm size and ownership structure to control for the probability of acquisition.[18] We examine the relation between voting premiums and market leverage in dual class firms by conducting both OLS and IV analyses (using book leverage generates similar results). In our IV analysis, we instrument for leverage using the investment tax credit. The tax credit is likely to affect the level of debt in a firm, but it is less likely to be directly associated with the voting premium, except through leverage. If debt acts as a bonding mechanism in dual class firms, then we expect a negative coefficient on *LEV_MKT* (α_1).

Panel B of Table 10 presents the results of our analyses in Equation (6). As expected, the coefficient on *LEV_MKT* is negative in both the OLS and IV models; it is statistically significant (at the 5% level) in the IV model. This analysis suggests that dual class firms with higher levels of debt have significantly lower voting premiums. In essence, the control benefits enjoyed by insiders are lower in dual class firms with higher levels of debt due to the additional monitoring and governance role of lenders. This evidence is in support of the bonding role of debt in dual class firms and furthers the literature on the cross-sectional variation in voting premiums.

7. Conclusion

We investigate the governance role of debt in the context of dual class ownership. We argue that insiders

[16] We note that the measure for *TOBIN'S_Q* has the market value of assets in the numerator and the measure for *LEV_MKT* has the market value of assets in the denominator, which could lead to a "mechanical" relation between these two variables. We run a robustness check with an additional control of 1/*Market Capitalization* to alleviate any potential mechanical effect (results available on request). Our results are robust to including this control.

[17] We note that, for the Tobin's q analyses, the overidentification tests reject the hypotheses that the instruments are exogenous as a group. We note that this result is consistent with Gompers et al. (2010). However, the results using the other econometric techniques are in line with those we obtain using IV.

[18] In this analysis, we use the logarithm of total assets (instead of market capitalization) as the measure of size to prevent any mechanical relations through price in the voting premium analysis. We would also like to point out that we have a very small sample of dual class firms where the superior shares are traded, and as a result we are able to compute voting premiums only for these firms. This is consistent with the observation in Gompers et al. (2010, p. 1053) that "about 85 percent of the dual-class sample has at least one non-traded class" and that "in the vast majority of these cases, the superior class is not traded." Therefore, our results and inferences from this analysis should be interpreted with this limitation in mind.

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Table 10 Dual Class Firms and Capital Market Outcomes: The Role of Leverage

Panel A: The effect on Tobin's *q*

	(1) OLS Full sample	(2) OLS Low-lev	(3) OLS High-lev	(4) IV Full sample	(5) IV Low-lev	(6) IV High-lev
DUAL	−0.250***	−0.268**	−0.088***	−0.711***	−0.753**	0.123
	(6.61)	(4.36)	(3.31)	(3.85)	(2.11)	(1.01)
Control variables	Included	Included	Included	Included	Included	Included
No. of observations	47,359	23,469	23,890	40,234	19,756	20,478
Adjusted *R*-squared	0.28	0.31	0.23			
Partial *R*-squared				0.0722	0.0466	0.0910
Partial *F*-statistic				$F_p = 22.14$ ($p = 0.0000$)	$F_p = 8.76$ ($p = 0.0007$)	$F_p = 21.11$ ($p = 0.0000$)
Overidentifying restriction				$\chi 2 = 11.816$ ($p = 0.008$)	$\chi 2 = 10.455$ ($p = 0.0151$)	$\chi 2 = 11.985$ ($p = 0.0074$)
Hausman test				$F = 16.2887$ ($p = 0.0001$)	$F = 26.839$ ($p = 0.0000$)	$F = 10.672$ ($p = 0.0011$)

Panel B: Dual class firms, voting premium, and leverage

	VOTING_PREMIUM OLS	*VOTING_PREMIUM* IV
LEV_MKT	−4.292	−32.457**
	(1.40)	(2.35)
PROP_VOTESHR	−4.269**	−0.171
	(2.00)	(0.06)
SIZE	1.641***	2.187***
	(3.57)	(3.94)
BTM	3.078***	6.399***
	(3.11)	(3.07)
ROA	−1.653	−12.013*
	(0.45)	(1.85)
Constant	−9.283***	−12.299***
	(3.41)	(3.99)
No. of observations	293	293
Adjusted *R*-squared	0.26	
Partial *R*-squared		0.0009
Partial *F*-statistics		$F_p = 15.3292$ ($p = 0.0001$)
Hausman test		$F = 8.07545$ ($p = 0.0048$)

Notes. Panel A presents the results of the OLS and the second stage of the IV models on the association between Tobin's *q* and dual class ownership. Firms are divided into high- and low-leverage groups, and the relations are examined in each leverage subgroup. *DUAL* is a dummy that equals 1 if the firm has dual class stock, and 0 otherwise; *TOBINS_Q* is the ratio of market value of assets to the book value of assets where the market value of assets is calculated as the book value of assets less the book value of equity plus the market value of equity; *STD_DA* is the standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model during the years $t-5$ to $t-1$ and multiplied by negative 1. Control variables in panel A include *SIZE, DIV, ROA, TANGIBILITY, SG&A, CAPEX, REV_GROWTH, R&D, STD_RET, BETA, FIRM_AGE, #SEGMENTS, TAX CREDIT, LOG#ANALYSTS, BASPREAD, STD_DA, STD_ROA*, and *LOSS*; control variables in panel B include *SIZE, BTM, DIV, ROA, TANGIBILITY, SG&A, CAPEX, REV_GROWTH, R&D, STD_RET, BETA, FIRM_AGE, #SEGMENTS, TAX_CREDIT, LOG#ANALYSTS, BASPREAD, STD_ROA*, and *LOSS*. See Appendix A for detailed definitions and their sources. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics in parentheses are based on robust standard errors double clustered by firm and year. The partial *R*-squared and other diagnostic tests relate to the equation with *DUAL* as the endogenous variable.

Panel B presents the results of the OLS and the second stage of the IV regressions on the association between voting premium and leverage in dual class firms. *VOTING_PREMIUM* is the ratio of the price of one voting right and one cash flow right calculated as in Zingales (1995); *LEV_MKT* is the ratio of the total debt to the market value of equity for the year; *PROP_VOTESHR* is calculated as in Zingales (1995) and is the ratio between the total normalized number of votes (obtained by attributing one vote to each superior voting share and *r* of a vote to each inferior voting share) and the total number of outstanding shares; *SIZE* is the natural logarithm of total assets; *BTM* is the book value of equity divided by the market value of equity; *ROA* is income before extraordinary items divided by average total assets. See Appendix A for detailed definitions of these variables and their sources. To mitigate the influence of outliers, we leave out 1% of observations at each (applicable) tail for all control variables. The *t*-statistics in parentheses are based on robust standard errors.

*Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level.

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in dual class firms use debt as a bonding mechanism that disciplines their pursuit of nonproductive objectives and alleviates the conflict between shareholder classes. In support of the bonding hypothesis, we find that dual class firms on average have higher levels of debt relative to single class firms. This result is robust across several econometric techniques that control for endogeneity, including propensity score matching, an instrumental variables estimation, and a treatment effects model. Further, our cross-sectional analyses indicate that dual class firms where insiders have greater incentives to bond (namely, those with higher agency conflicts, more growth opportunities, and greater needs to raise equity financing) are more likely to rely on higher levels of debt financing.

We also examine how specific contracting mechanisms associated with debt financing vary with the adoption of dual class ownership structures. We find that, compared to single class firms, dual class firms have a greater tendency to issue private loans, are more likely to borrow from relationship lenders, and issue loans that rely more extensively on cash sweeps and performance-based covenants. Taken together, the various contracting choices of dual class firms documented in our paper support the hypothesis that debt performs a governance role in these companies. Further, in corroboration of the bonding hypothesis, we document that private debt issuances trigger significantly positive market reactions to the inferior class stock relative to both the superior class stock and a matched sample of single class firms. Finally, we document that the adverse effect of dual class status on Tobin's q is attenuated by the effect of leverage and the voting premiums are lower in dual class firms with higher leverage.

We add to empirical literature on the governance role of debt in a setting where there are agency conflicts between shareholder classes. Our study also contributes to the active debate around dual class ownership structures by providing evidence that dual class firms employ debt and its associated monitoring mechanisms to minimize the agency costs arising from the separation of ownership and control. Our results suggest that the view that accounting information plays an efficiency role in debt contracts (Watts and Zimmerman 1978, 1986, 1990) extends to the conflict between shareholder classes. More empirical work is needed to understand the economic benefits associated with dual class ownership structures.

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Appendix A. Variable Definitions

	Firm characteristics
DUAL	A dummy variable that equals 1 if a firm has a dual class ownership structure, and 0 otherwise.
SIZE	The natural logarithm of the market capitalization of the firm.
BTM	The book value of equity divided by the market value of equity.
DIV	The ratio of common dividends declared divided by market capitalization.
ROA	Income before extraordinary items scaled by average total assets.
TANGIBILITY	The ratio of total net property, plant, and equipment (PPE) divided by total assets.
SG&A	The ratio of selling, general, and administrative expenses divided by total assets.
CAPEX	The ratio of capital expenditures divided by total assets.
REV_GROWTH	The ratio of current year revenues to revenue in the prior year.
R&D	The ratio of research and development expense divided by market capitalization. This variable is set equal to 0 when the data are missing.
STD_RET	The volatility of monthly stock returns over the prior year.
BETA	Security beta calculated over the preceding year based on the correlation of daily stock returns with daily returns on an equally weighted market index.
FIRM_AGE	The natural logarithm of the number of years since the first year the borrower has data in the CRSP/Compustat merged database.
#SEGMENTS	An indicator variable that equals 1 when the firm has more than one Compustat business segment during the fiscal year, and 0 otherwise.
LOG#ANALYSTS	The natural logarithm of 1 plus the number of analysts following the firm.

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Appendix A. (Continued)

	Firm characteristics (continued)
STD_DA	The standard deviation of the firm-level residuals of the Dechow and Dichev (2002) model as modified by McNichols (2002) during the years $t-5$ to $t-1$. The model is a regression of working capital accruals on lagged, current, and future cash flows plus the change in revenue and PPE. All variables are scaled by average total assets. The model is estimated cross-sectionally for each industry with at least 20 observations in a given year based on the Fama and French (1997) 48-industry classification.
TAX_CREDIT	Indicator variable that takes the value of 1 when an investment tax credit is present, and 0 otherwise.
STD_ROA	The standard deviation of income before extraordinary items divided by the firm's average total assets measured over the previous five years.
LOSS	An indicator variable that equals 1 if net income before extraordinary items is negative, and 0 otherwise.
ALTMAN_ZSCORE	Based on Altman's Z-score based on the bankruptcy prediction (Hillegeist et al. 2004).
FREE_CASH	The ratio of operating cash flows to total assets.
PAST_EQUITY_ISSUANCE	An indicator variable that equals 1 if the firm had a secondary equity offering in the past five years, and 0 otherwise.
FUT_EQUITY_ISSUANCE	An indicator variable that equals 1 if the firm had a secondary equity offering in the following five years, and 0 otherwise.
WEDGE	The difference (wedge) between insider voting rights and insider cash flow rights.
INSIDER_OWN	The cash flow rights of controlling insiders in dual class firms.
TOBIN'S_Q	The ratio of the market value of assets to the book value of assets where the market value of assets is calculated as the book value of assets less the book value of equity plus the market value of equity.
MTB	Market value of equity divided by the book value of equity.
VOTING_PREMIUM	The ratio of the price of a voting right to that of a cash flow right calculated as in Zingales (1995).
PROP_VOTESHR	The ratio between the total normalized number of votes (obtained by attributing one vote to each superior voting share and r of a vote to each inferior voting share) and the total number of outstanding shares. This is calculated as in Zingales (1995).
	Capital structure variables
LEV_BK	The total liabilities divided by the book value of assets.
LEV_MKT	The total liabilities divided by the market value of equity plus the book value of liabilities.
PROP_SHORT	The fraction of a firm's total debt that matures in three years or less.
BASPREAD	Average bid–ask spread over the prior year.
CONVERTIBLE	A dummy variable that equals 1 if a loan is convertible, and 0 otherwise.
SECURED	A dummy variable that equals 1 if a loan is secured, and 0 otherwise.
LOAN_SIZE	The ratio of loan size divided by total assets (all facilities included).
MATURITY	The logarithm of the loan maturity of the facility (in months).
REVOLVER	A dummy variable that equals 1 if a revolving facility exists in the deal package, and 0 otherwise.
PVT_DEBT	A dummy variable that equals 1 if the firm has at least one bank loan outstanding, and 0 otherwise.
REL_BANK	A dummy variable that equals 1 if there was prior lending by the same lender in the past, and 0 otherwise.
EXCESS_CF	An indicator variable that equals 1 when a sweep on distribution of excess cash flows is included in a credit agreement, and 0 otherwise.
ASSET_SALE	An indicator variable that equals 1 when a cash sweep on asset sales is present in a credit agreement, and 0 otherwise.
DEBT_ISSUE	An indicator variable that equals 1 when a cash sweep on debt issuances is present in a credit agreement, and 0 otherwise.
EQUITY_ISSUE	An indicator variable that equals 1 when a cash sweep on equity issuances is present in a credit agreement, and 0 otherwise.
INS_PROCEEDS	An indicator variable that equals 1 when a cash sweep on insurance proceeds is present in a credit agreement, and 0 otherwise.
SWEEPS	A count of sweeps-type covenants of the following types: asset sales sweep, debt issuance sweep, equity issuance sweep, insurance proceeds sweep, and excess cash flow sweep. Cash sweeps require a part or all of the cash flow from these activities to be used in reducing the amount of indebtedness.
P_COVENANTS	The number of performance-based covenants, where the covenant benchmarks include (1) the cash interest coverage ratio, (2) the debt service coverage ratio, (3) the level of earnings before interest, taxation, depreciation, and amortization (EBITDA), (4) the fixed charge coverage ratio, (5) the interest coverage ratio, (6) debt to EBITDA, and (7) senior debt to EBITDA.
C_COVENANTS	The number of capital-based covenants, where the covenant benchmarks include the (1) quick ratio, (2) current ratio, (3) debt-to-equity ratio, (4) loan-to-value ratio, (5) debt-to-tangible-net-worth ratio, (6) leverage ratio, and (7) the senior leverage ratio.
	Instrumental variables for DUAL or WEDGE
FAMILY	A dummy variable that equals 1 if the firm is a family firm in its IPO year, and 0 otherwise.
MEDIA	A dummy variable that equals 1 if the firm is in the media industry in its IPO year, and 0 otherwise. Media companies are those belonging to SIC codes 2710-11, 2720-21, 2730-31, 4830, 4832-33, 4840-41, 7810, 7812, and 7820.
%SALEMSA_IPO	The percentage of all Compustat sales by firms located in the same metropolitan or micropolitan statistical area (MSA) as a firm in the year before the firm's IPO.
SALES/ REG SALES	The ratio of a firm's sales to the sales of all firms in the same region.

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Appendix B. Descriptive Statistics on the PSM Sample of the Leverage Analyses

Logistic regressions	
	Dependent variable = *Dual*
SIZE	0.123***
	(3.33)
BTM	0.529***
	(6.64)
DIV	−4.289
	(1.45)
ROA	−0.213
	(0.70)
TANGIBILITY	−0.842***
	(2.86)
SG&A	0.456*
	(1.65)
CAPEX	−0.746
	(0.83)
REV_GROWTH	−0.093
	(1.28)
R&D	−4.112***
	(3.03)
STD_RET	−12.063***
	(4.28)
BETA	−0.101*
	(1.69)
FIRM_AGE	−0.013
	(0.17)
#SEGMENTS	−0.080***
	(2.90)
TAX_CREDIT	−1.626***
	(2.71)
LOG*#ANALYSTS*	−0.046
	(0.88)
BASPREAD	−0.261
	(0.14)
STD_DA	−5.398***
	(3.79)
STD_ROA	−2.099**
	(2.16)
LOSS	0.121
	(1.32)
N	47,923
McFadden's pseudo *R*-squared	0.0505
χ^2 ($P > \chi^2$)	149.15 (0.000)

Notes. Appendix B presents the logistic regression for the propensity-score matching technique for the leverage analyses in Table 4. See Appendix A for definitions of the variables and their sources. PSM covariance imbalance tests indicate that none of the variables are significantly different between the matched single class and dual class firms. The analysis indicates that the matching algorithm was successful in achieving a balanced control group, and differences in these observed variables across the treatment and control samples are not likely to confound our estimates of the average treatment effect.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Appendix C. Sensitivity to Hidden Bias

Hidden bias arises when the matching procedure does not take into account the unobservable variables that influence the outcome variable and that are also correlated with the selection into the treatment group. Although it is not possible to directly test for the presence of omitted unobservables, the sensitivity of the results to the presence of such variables, or hidden bias, can be examined. One approach to evaluate the sensitivity of the results to a potential hidden bias is to use the bounding approach proposed by Rosenbaum (2002). The bounds are given by the odds ratio in a treatment versus a control group, i.e., $p_i/(1-p_i)/p_j/(1-p_j)$ (where p is the probability of being in a treatment group), for two observationally equivalent subjects/companies. As pointed out by Armstrong et al. (2010b) and Lee and Lee (2009), no objective benchmark exists to determine the appropriate bounds, and in fact such bounds are likely to be context specific. These authors call for more research to establish an empirical distribution of acceptable bounds. Given this, we follow an alternative approach developed by Altonji et al. (2005). The advantage of this approach is that it evaluates the degree of hidden bias using a concrete benchmark.

We briefly summarize the methodology in Altonji et al. (2005) below. These authors argue that the selection on observables can be used as a useful benchmark to evaluate the selection on unobservables and whether it may cause hidden bias. Specifically, they argue that the benchmark case where the part of the outcome variable (e.g., leverage, in our case) that is related to observables has the same relationship with the treatment indicator (dual class ownership) as the part related to the unobservables provides an upper bound for the "hidden bias."

More formally, we consider the following model by applying the approach of Altonji et al. (2005):

$$Leverage = \alpha DUAL + W'\Gamma = \alpha DUAL + X'\gamma + \epsilon, \qquad \text{(C1)}$$

where *Leverage* is our outcome variable, *DUAL* is the dual class indicator, W is the full set of variables (observed and unobserved) that affect *Leverage*, X is a set of observed variables, and ϵ is defined so that $\mathrm{Cov}(\epsilon, X) = 0$ (i.e., parameter γ reflects the direct effect of X and the correlation of X with unobserved elements of W). To evaluate the strength of the selection on observables, we use the following model:

$$DUAL = \varphi_{\mathrm{obs}} X'\gamma + \varphi_{\mathrm{unobs}}\epsilon + \vartheta, \qquad \text{(C2)}$$

where $X'\gamma$ is the index of observables, ϵ stands for all unobservable variables in Equation (C1), and ϑ captures factors orthogonal to other regressors. Note that α is identified when $\varphi_{\mathrm{unobs}} = 0$, which is a standard assumption. Alternatively, another way to identify α is to assume $\varphi_{\mathrm{obs}} = \varphi_{\mathrm{unobs}}$, i.e., the selection on observables equals that on unobservables (which is arguably the upper bound for φ_{unobs}). Altonji et al. (2005) show that this condition is equivalent to

$$(\mathrm{E}(\epsilon \mid DUAL = 1) - \mathrm{E}(\epsilon \mid DUAL = 0))/\mathrm{Var}(\epsilon)$$
$$= (\mathrm{E}(X'\gamma \mid DUAL = 1) - \mathrm{E}(X'\gamma \mid DUAL = 0))/\mathrm{Var}(X'\gamma). \qquad \text{(C3)}$$

To apply this result, consider the selection equation $DUAL = X'\beta + \widehat{DUAL}$, where $\widehat{DUAL}$ is a residual from a linear regression of *DUAL* on X. Then Equation (C1) can be written as

$$Y = \alpha\widehat{DUAL} + X'(\gamma + \alpha\beta) + \epsilon. \qquad \text{(C4)}$$

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Table C.1 Amount of Bias on Unobservables Relative to the Selection on Observables Required to Attribute the Entire Dual Class Firm Effect to Selection Bias

Outcome	Bias	Unconstrained estimate	Ratio
LEV_MKT	0.025	0.035 (5.30)	1.427
LEV_BK	0.018	0.043 (5.47)	2.446

Notes. This table presents the tests on selection bias based on the method in Altonji et al. (2005) corresponding to the propensity score matching for the leverage analyses in Table 4. Bias is computed under the assumption that the selection on observables is equal to the selection on unobservables. See Appendix A for the variable definitions.

In this case, the OLS estimate $\hat{\alpha}$ can be shown to be

$$\begin{aligned} p\lim\hat{\alpha} &= \alpha + \frac{\operatorname{cov}(\widehat{DUAL}, \epsilon)}{\operatorname{var}(\widehat{DUAL})} \\ &= \alpha + \frac{\operatorname{var}(DUAL)}{\operatorname{var}(\widehat{DUAL})}[\mathrm{E}(\epsilon \mid DUAL=1) - \mathrm{E}(\epsilon \mid DUAL=0)] \\ &= \alpha + \frac{\operatorname{var}(DUAL)}{\operatorname{var}(\widehat{DUAL})} * \frac{\operatorname{var}(\epsilon)}{\operatorname{var}(X'\gamma)}(\mathrm{E}(X'\gamma \mid DUAL=1) \\ &\quad - \mathrm{E}(X'\gamma \mid DUAL=0)), \end{aligned} \tag{C5}$$

where the last equality follows from Equation (C3).

Under the null hypothesis of no effect of dual class ownership, $\alpha = 0$, and assuming that the selection on unobservables is as strong as the selection on observables, Equation (C5) provides the bias in OLS estimates. This bias is summarized in the table below, which is equal to 0.025 in the case of market leverage and 0.018 in the case of book leverage. At the same time, the unconstrained estimate $\hat{\alpha}$, assuming no selection on unobservables, is 0.035; it is 0.043 in the case of market and book leverages. Therefore, for hidden bias to fully explain these unconstrained estimates, the selection on unobservables needs to be 1.427 times in the case of market leverage, and 2.446 times in the case of book leverage, as strong as the selection on observable variables (see Table C.1). Note that Altonji et al. (2005) argue that the selection on unobservables is unlikely to be stronger than the selection on observables because observables are chosen based on theory or prior empirical work. Given this, we conclude that "hidden bias" due to the selection on unobservables is unlikely to pose a threat to the validity of our baseline results.

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