Sticking around Too Long? Dynamics of the Benefits of Dual-Class Voting

Finance Working Paper N° 590/2019
January 2019

Hyunseob Kim
Cornell University

Roni Michaely
University of Geneva and SFI

ECGI Working Paper Series in Finance

Sticking around Too Long? Dynamics of the Benefits of Dual-Class Voting

Working Paper N° 590/2019

January 2019

Hyunseob Kim

Roni Michaely

We appreciate comments from Felipe Aldunate, Lucian Bebchuk, Alon Brav, Eitan Goldman, John Graham, Rob Jackson, Wei Jiang, Andrew Karolyi, Chen Lin, Kate Litvak, Alberto Manconi, Ernst Maug, Justin Murfin, Alexandra Niessen-Ruenzi, Stefano Rossi, Benjamin Segal, Hannes Wagner, Yishay Yafeh, and seminar and conference participants from Ackerman Conference on Corporate Governance, Bocconi University, Cornell University, FinanceUC conference (PUC de Chile), Goethe University, Hebrew University of Jerusalem, Inquire UK, SMU, 2018 Sun Yet Sen University Finance Conference, Tel Aviv University Finance Conference, Universidad de los Andes Chile, University of Alberta, UIBE, University of Mannheim, University of Massachusetts–Amherst, and US Securities and Exchange Commission, financial support from the Cornell Institute for the Social Sciences, and excellent research assistance from Ikchan An, Jee-Hun Choi, Syungjin Han, Hassan Ilyas, Kenny Jing, Julia Kharzeev, Dawoon Kim, Eric Kim, Seungsoo Kim, Yejun Kim, Boyao Li, Cindy Lu, Amani Moin, Pradeep Muthukrishnan, and Ahmad Sabbagh.

Abstract

Using a new dataset of corporate voting-rights from 1971 to 2015, we find that young dual-class firms trade at a premium and operate at least as efficiently as young single-class firms. As dualclass firms mature, their valuation declines, and they become less efficient in their margins, innovation, and labor productivity compared to their single-class counterparts. Voting premiums increase with firm age, suggesting that private benefits increase over maturity. Most sunset provisions that dual-class firms adopt are ineffective. Our findings suggest that effective, timeconsistent sunset provisions would be based on age or on inferior shareholders' periodic right to eliminate dual-class voting.

Keywords: Dual class shares, Voting rights, Sunset provisions, Firm maturity

JEL Classifications: G14, G18, G30

Hyunseob Kim*
Assistant Professor of Finance
Cornell University, Johnson Graduate School of Management
321 Sage Hall, 114 East Avenue
Ithaca, NY 14853, United States
phone: +1 607 255 8335
e-mail: hk722@cornell.edu

Roni Michaely
Professor of Finance
University of Geneva, Geneva Finance Research Institute
Bd du Pont d'Arve 40
1211 Geneva 4, Switzerland
e-mail: roni.michaely@unige.ch

*Corresponding Author

Sticking around Too Long?

Dynamics of the Benefits of Dual-Class Voting[*]

Hyunseob Kim[†]

Roni Michaely[‡]

January 2019

Abstract

Using a new dataset of corporate voting-rights from 1971 to 2015, we find that young dual-class firms trade at a premium and operate at least as efficiently as young single-class firms. As dual-class firms mature, their valuation declines, and they become less efficient in their margins, innovation, and labor productivity compared to their single-class counterparts. Voting premiums increase with firm age, suggesting that private benefits increase over maturity. Most sunset provisions that dual-class firms adopt are ineffective. Our findings suggest that effective, time-consistent sunset provisions would be based on age or on inferior shareholders' periodic right to eliminate dual-class voting.

Key words: Dual class shares; Voting rights; Sunset provisions; Firm maturity

JEL Codes: G14, G18, G30

---

[*] We appreciate comments from Felipe Aldunate, Lucian Bebchuk, Alon Brav, Eitan Goldman, John Graham, Rob Jackson, Wei Jiang, Andrew Karolyi, Chen Lin, Kate Litvak, Alberto Manconi, Ernst Maug, Justin Murfin, Alexandra Niessen-Ruenzi, Stefano Rossi, Benjamin Segal, Hannes Wagner, Yishay Yafeh, and seminar and conference participants from Ackerman Conference on Corporate Governance, Bocconi University, Cornell University, FinanceUC conference (PUC de Chile), Goethe University, Hebrew University of Jerusalem, Inquire UK, SMU, 2018 Sun Yet Sen University Finance Conference, Tel Aviv University Finance Conference, Universidad de los Andes Chile, University of Alberta, UIBE, University of Mannheim, University of Massachusetts–Amherst, and US Securities and Exchange Commission, financial support from the Cornell Institute for the Social Sciences, and excellent research assistance from Ikchan An, Jee-Hun Choi, Syungjin Han, Hassan Ilyas, Kenny Jing, Julia Kharzeev, Dawoon Kim, Eric Kim, Seungsoo Kim, Yejun Kim, Boyao Li, Cindy Lu, Amani Moin, Pradeep Muthukrishnan, and Ahmad Sabbagh.
[†] Johnson Graduate School of Management, Cornell University; E-mail: hk722@cornell.edu; Phone: (607) 255-8335.
[‡] Geneva Finance Research Institute, University of Geneva and SFI; E-mail: roni.michaely@unige.ch.

1. Introduction

Grossman and Hart (1988) and Harris and Raviv (1988) show that under plausible conditions, a simple proportional voting right of "one share–one vote" is optimal. Consistent with theory, evidence shows that a dual-class share structure, which gives disparate voting rights to the superior voting shares, is associated with less efficient corporate decisions and, ultimately, worse performance and valuation. Succinctly summarizing the current academic view, Adams and Ferreira (2008, p.52) write: "The idea that the 'one share-one vote' principle is desirable is what might be considered the dominant view in the literature." Recently, FTSE Russell and S&P Dow Jones decided to exclude some dual-class stocks from their indices. Despite these apparent disadvantages and opposition, we observe a rising popularity of this structure. For example, an increasing fraction of initial public offerings (IPOs) in the high-tech sector, such as those offered by Google, Facebook, and Alibaba, have adopted dual-class voting (Fig. 1). More generally, dual-class voting is pronounced among young firms with high growth opportunities, suggesting a more nuanced view of the dual-class structure, depending on firm maturity or growth.

In this paper, we challenge the dominant view that dual-class voting is suboptimal. Specifically, we develop and test the prediction that the net benefits of adopting a dual-class structure decline over a firm's life cycle. Theories of investor protection and voting rights predict that the effects of a dual-class (in contrast to a single-class) structure on firm performance and value are more favorable for young firms for several reasons (e.g., Shleifer and Wolfenzon 2002; Burkart and Lee 2008). First, agency costs associated with a dual-class structure are likely to be lower for young, fast-growing firms in which insiders have significant (economic and noneconomic) incentives to maximize firm value. This is partly because their payoff depends much more on future firm value than on current consumption of private benefits (e.g., DeMarzo and Fishman 2007). Second, for young firms in which unique knowledge and growth opportunities are heavily tied to founder-managers (i.e., the incumbent), benefits of control contests to firm value would be small (e.g., Grossman and Hart 1988). Third, outside investors are less knowledgeable than insiders about the quality of investments, particularly for young firms. As a result, protection from capital market pressure, a key benefit of the dual-class share structure, is more important for young firms (Stein 1988). Thus, it could be advantageous to create a structure in which young, growing firms benefit from accessing the capital market while being protected from its pressure and minimizing agency costs (see Appendix A for a detailed discussion of this dynamic trade-off).

Motivated by these theories, we empirically explore the cost-benefit dynamics of a dual-class share structure over firm maturity by constructing a data set of dual-class firms in the United States from 1971 to 2015. The data set contains detailed information on voting rights of each class of shares for nearly 9,000 dual-class firm-years (920 unique dual-class firms); recapitalizations of single-class structures into dual-class structures, and vice versa; and voting premiums for a subsample of firms for which both classes are publicly traded.

Using this data set, we study the impact of the dual-class structure over firms' life cycles using several empirical settings. (As detailed below, our analysis accounts for sample selection between dual- and single-class firms using several approaches.) We first examine the prediction that agency costs associated with a dual-class structure would increase over maturity. Using a sample of dual-class firms in which both classes of stocks are traded, we find that the premium of the superior voting stock is 3.8 percentage points higher for "mature" than "young" dual-class firms, controlling for takeover probability.[1] The voting premium also increases as dual-class firms' growth rate declines. These findings are consistent with private benefits of control increasing over dual-class firms' maturity (e.g., Zingales 1995). Consistent with increasing agency costs of withholding cash to dual-class firms' shareholders (e.g., La Porta et al. 2000; Shleifer and Wolfenzon 2002), we also find that the announcement return for dividend increases or initiations becomes more positive for dual-class than single-class firms as they mature.

The evidence that agency costs associated with dual-class voting increase with maturity may suggest the net economic benefits of dual-class voting also decline over maturity. We test this hypothesis in a number of ways. First, we examine the market's reaction to the announcement of dual-class recapitalizations, in which a superior voting stock class is created, to gauge the perceived value of dual-class structures, conditional on firm maturity. When young firms announce such a recapitalization, the cumulative abnormal return (CAR) is significant at 3.5%, suggesting a potentially positive value impact of dual-class structures. However, when mature firms announce the switch, the CAR is 4.6% lower than in the case of young firms (= -1.2%). This is the first evidence that the market reaction to dual-class recapitalizations varies conditional on firm maturity,

[1] In the main analysis, we define "young" ("mature") firms as firms younger than (older than or equal to) 12 years—the median age for dual-class firms in the sample—following their IPOs. The baseline results are robust to this cutoff choice to define mature firms, such as 5–15 years after an IPO. Using a continuous variable for age yields similar results (see Figure 3). We define age based on IPO years to capture time passed as public firms (We thank Lucian Bebchuk for this insight). The baseline results are also robust to an alternative definition of age based on the founding year, which is available for a subset of firms in our sample (see Appendix Table A2, Column (2)).

and importantly, is consistent with a declining net benefit of dual-class voting over maturity. Second, we examine the market's reaction to the announcement of dual-class stock unifications, in which multiple stock classes with different voting rights are unified to become one share–one vote, conditional on maturity. We again find evidence that a dual-class structure becomes less beneficial as a firm ages: when mature firms announce that they plan to unify multiple classes of shares, the CAR is significant at 4.4%, whereas there is no significant market reaction to young firms making such an announcement.

Third, building upon existing work that examines the relation between dual-class structures and firm valuation (e.g., Cronqvist and Nilsson 2003; Gompers, Ishii, and Metrick 2010), we analyze how the association between dual-class voting and Tobin's q, a widely used measure of valuation, changes over maturity using the full sample of both dual- and single-class firm-years from 1971 to 2015. This analysis reveals that young dual-class firms have 9% greater valuation relative to single-class firms, controlling for industry-by-year fixed effects and firm-level characteristics. Importantly, however, dual-class firms experience a 10% greater decline in Tobin's q as they mature relative to single-class firms. In addition, we find robust results by employing alternative measures of Tobin's q that address difficulties of measuring "true" market value for dual-class firms and measuring value of intangible assets (e.g., Peters and Taylor 2017).[2] Further, we find similar results when using growth rates instead of firm age as a proxy for maturity, or measuring a firm's age from the time of its incorporation rather than the time of its IPO.

Importantly, we explore possible channels underlying the increasing agency costs and declining valuation impact of dual-class voting over firm maturity. We find that relative to their single-class counterparts, as dual-class firms mature, (1) operating margins and labor productivity deteriorate significantly, controlling for time-varying industry shocks and firm characteristics; (2) the pace of innovation decreases more, indicating declining benefits of dual-class structures for maturing firms (e.g., allowing firms to invest in long-term projects such as innovation); and (3) firms become less responsive to changes in investment opportunities.

To mitigate the concern that the results for Tobin's q are driven by a different sample selection of dual- and single-class firms, we show that our results continue to hold in a variety of

[2] Following Gompers, Ishii, and Metrick (2010), in our baseline measure of q, we assume equal prices across classes of stocks issued by a given firm. Given that nontraded stocks account for a small fraction of total equity, making alternative assumptions on the price of the superior voting shares does not affect our results in a significant manner. See Section 3.4.2 and Appendix Table A2 for details.

specifications that control for sample selection. First, we find a consistent result in a specification that employs firm fixed effects. This analysis alleviates the concern that fixed differences across firms with different voting rights drive our baseline results. Second, we construct a matched sample of dual- and single-class firms in the same industry and year using Tobin's *q* and firm size at their IPOs. We find that in this matched sample, in which both dual- and single-class firms have statistically similar Tobin's *q* at IPO by construction, the valuation of dual-class firms declines more than their single-class counterparts over maturity. This analysis thus mitigates the concern that dual-class firms experience a greater decline in valuation and performance over maturity due to different valuation levels and growth potentials at IPO between dual- and single-class firms, a specific type of selection. Third, controlling for sample attrition rates (e.g., single-class firms tend to leave stock markets more often than dual-class firms over maturity) using the Heckman (1979) sample selection model, we continue to find a significantly negative effect of dual-class structures on changes in firm valuation as they mature.

Furthermore, we explore increasing systematic risk as an additional channel via which dual-class firms experience greater increase in agency costs and decline in valuation over maturity. This channel might have a material impact if, for example, managers of mature dual-class firms are reluctant to reduce capital and labor in bad times (as a form of agency costs; see, e.g., Bertrand and Mullainathan 2003), which in turn increases firms' systematic risk (e.g., Abel and Eberly 1994; Zhang 2005). We show two empirical patterns in line with the channel. First, relative to single-class firms, dual-class firms exhibit declining *q*-sensitivities of investment and employment growth as they mature, particularly when demand conditions are weaker, which is important for the pricing of risk. Second, the asset-pricing factor loading on HML ("value") is significantly higher for mature dual-class firms than mature single-class firms (but not for young firms), even after controlling for their book-to-market. These results are consistent with the hypothesis that mature dual-class firms face higher capital and labor adjustment costs, which in turn lead to higher systematic risk.

In sum, we find that maturing dual-class (vs. single-class) firms experience increasing agency problems, decreasing valuation, margins, labor productivity, and pace of innovation, and they become more reluctant to cut investment and employment in bad times, increasing risk. Thus, the variety of tests point toward one conclusion: the costs of a dual-class structure increase as firms mature while the benefits dissipate. These results suggest that when control contests are most beneficial (e.g., firms are mature, growth slows), the dual-class structure may prevent investors from intervening.

Why might dual-class firms not switch to a single-class structure when they mature? Under a dual-class structure, controlling shareholders are unlikely to relinquish power voluntarily, especially when private benefits are large, even if the structure reduces overall firm value. Consistent with this conjecture, we find that only 56 out of the 373 (15%) dual-class firms that went public from 1994 to 2015 in our sample have switched to a single-class structure (as of this writing). This private incentive of the incumbent suggests that a solution should be embedded in the contract ex ante. One such solution is a "sunset provision" in which a threshold event, such as time elapsed following an IPO or the retirement of the founder(s), automatically triggers the elimination of dual-class voting.

Using hand-collected data on dual-class firms' provisions, we find that while a majority (66.2%) of dual-class firms have sunset provisions, most are ineffective because they are conditional on either the transfer of superior shares from insiders to a third party or a reduction in the collective ownership of insiders below a threshold. These types of sunset provisions are unlikely to solve the ex post agency problem involved with mature firms' dual-class voting, since they depend on the discretionary actions of superior class shareholders. We find, however, that a minority of dual-class firms (6.4%) have provisions that are conditional on passage of time since their IPO. These provisions are effective because ex post they are independent of controlling shareholders' private interest.[3] Our evidence that dual-class structures better serve outside shareholders for young than mature firms, supports the case for these sunset provisions, which would allow consolidated control by the incumbent when it likely benefits outside shareholders along with more dispersed control as the benefits decline and agency costs increase.

Thus, given the possible benefits of a dual-class structure for young growth firms and declining net benefits over firms' life cycles, we argue that firms, investors, and regulators should look favorably at dual-class firms with effective sunset provisions, as opposed to either shunning dual-class firms (e.g., the Hong Kong Exchange until recently) or allowing registration without any conditions (e.g., US exchanges). One simple sunset provision is to set an expiration date, as in the case of Yelp (see footnote 3). A more elaborated, and perhaps better, provision is to give the

[3] For example, when listing its Class A (inferior voting) shares on the NYSE in 2012, Yelp instituted (in the articles of incorporation) that the dual-class structure would be eliminated if seven years pass since the IPO.

inferior class holders the right to decide on share unifications, for example, every seven years, as a time-consistent contact. This gives minority shareholders the right to consider whether the dual-class structure is optimal or whether switching to a single-class structure is more beneficial to outside shareholders. An important advantage of provisions that eliminate the structure at a predetermined point in time after an IPO is that they are simple and that the timing is contractible ex ante. We elaborate on these policy implications in Section 5.

With several notable differences, our paper is related to a concurrent paper by Cremers, Lauterbach, and Pajuste (2018). Both papers uncover the decline in the relative valuation of dual-class firms as they mature. However, we go beyond studying the dynamics of q for dual-class firms to provide novel evidence on plausible channels through which dual-class firms' valuation and performance decline more than single-class firms over maturity: higher agency costs reflected in increased voting premiums and value of dividend; declining profit margins, productivity, and pace of innovation; and increased risk. Further, we hand-collect detailed information on dual-class firms' sunset provisions and whether switches to single-class shares are due to these provisions. We are thus able to draw policy implications for the usage of dual-class shares along with sunset provisions. Last, by using hand-collected data on the complete history of dual-class firms, we show that market reactions to switching between dual- and single-class structures are consistent with increasing agency costs and the dynamics of valuation associated with dual-class voting over maturity.

The dual-class share structure is arguably a more effective form of takeover defense than other forms such as staggered boards and poison pills, which makes it unique in terms of the power it gives to controlling shareholders. Indeed, a comprehensive news search for all large IPOs during 2011–15 reveals that the public is much more concerned about dual-class shares than about other instruments that protect the incumbent's control.[4] However, these other forms of governance structures are used to consolidate control, and their effects may also vary between firms of different maturity. Foley and Greenwood (2010) and Field, Lowry, and Mkrtchyan (2013) compare ownership concentration and the effects of busy directors for young and mature firms. Field and

[4] Specifically, we conduct a comprehensive search of such major media sources as the *WSJ*, *NYT*, and *DJ Newswire* for a sample of firms that went public from 2011 to 2015 with a market value greater than $500m (to ensure potential media coverage). We look for articles that mention terms including "dual class," "staggered board," and "governance." We find news articles that express explicit concerns about dual-class voting for 13 out of 62 (21%) dual-class IPOs. In contrast, while 73% of matched (on industry and book assets) single-class IPO firms have staggered boards in their charter, we find no articles mentioning this fact or showing explicit concerns about staggered boards.

Lowry (2017) argue that in recent years IPO firms are more likely to have classified boards relative to mature firms because the net benefits are greater for young firms. Similarly, Johnson, Karpoff, and Yi (2018) show that the effects of takeover defenses (such as poison pills) on firm value become less favorable as firms age.

More broadly, this paper contributes to the literature on the economic effects of deviations from one share–one vote. We depart from existing work showing that these deviations are negatively associated with firm performance on average.[5] Specifically, we identify firm maturity and growth as important factors in which the benefits and costs of dual-class voting change, suggesting the importance of a dynamic governance structure. The common view that a dual-class structure is suboptimal for outside shareholders may be misguided. Rather, our findings show that the net benefits of dual-class structures are systematically related to firms' life cycles, and that effective sunset provisions for dual-class shares could increase its benefits over their life cycles.

2. Data and Measurement

2.1 Identifying dual-class firms

We construct our data set of dual-class firms in the United States for a sample period from 1971 to 2015. We hand-collect information on dual-class firms for the years 1971–93 and 2003–15 and obtain data from Andrew Metrick's website for the intervening years 1994–2002.[6] This is the most comprehensive and detailed dual-class database that currently exists. We outline our data collection approach below.

For our own data collection, we identify candidate dual-class firms by comparing a given firm's number of shares outstanding obtained from CRSP and Compustat. CRSP provides the number of shares outstanding at the security level (i.e., for each class of shares), and Compustat provides the corresponding data at the firm level (i.e., the sum across all classes of shares issued by the firm). Thus, a significant difference between the two numbers indicates that the firm might have multiple classes of shares, particularly when only one class is publicly traded. If the numbers of shares from CRSP and Compustat differ by more than 2%, we place those firm-years into a candidate set (following the approach introduced in Gompers, Ishii, and Metrick 2010, hereafter

[5] See, e.g., Claessens et al. (2002); Lemmon and Lins (2003); Cronqvist and Nilsson (2003); Masulis, Wang, and Xie (2009); and Gompers, Ishii, and Metrick (2010).

[6] We thank Andrew Metrick for making the data set on dual-class firms available on his website.

GIM). We supplement this set with a data set of dual-class IPOs from Jay Ritter's website.[7] We then hand-check whether firms in this candidate sample have multiple share classes with two data sources. For 1994–2015, we use the annual report (Form 10-K) and proxy statement (DEF 14A) taken from the SEC's EDGAR database for each firm-year, except for those covered by the GIM database. Specifically, we determine whether a firm has a dual-class structure by examining descriptions of voting rights and shares outstanding for multiple classes of common shares. The SEC's EDGAR does not provide information in electronic form for 1971–93, and so we use Moody's Manuals (the Capital Stock section) to determine whether each firm-year in the candidate sample has more than one class of shares, and collect information on the number of votes and shares outstanding for each class.

A notable fraction of firms with more than one class of common shares has the same number of votes across classes (e.g., one vote per share). We therefore determine whether these firms have disproportional voting rights between classes by manually examining security filings from the SEC's EDGAR and Moody's Manuals.[8] We find that there are three possible reasons why these firms have multiple share classes, two of which represent differential voting rights:

(1) Different classes have differing voting rights for director election. In a typical case in this category, one class has the right to elect two-thirds of the directors, and the other class, one-third. For these cases, we define the class with greater director election right as "superior." There are 435 dual-class firm-years in this category.

(2) Some firms use specific formulas to calculate the number of votes for different classes. A typical example involves a "superior" class of common stocks with a number of votes equal to the number of "holdings units" in a limited liability company that a small group of shareholders own. An "inferior" class usually carries one vote per share. These cases are rare, with 24 firm-years involved.

(3) The final category involves cases for which a dual-class structure appears to be set up for reasons other than giving disproportional voting rights. For example, Triple-S Management has issued Class B common stocks as a capital asset for tax purposes. In other cases, non-US

[7] We thank Jay Ritter for making the data set on dual-class IPOs available on his website, which is collected in part by Smart and Zutter (2003) and Loughran and Ritter (2004).

[8] In particular, we examine SEC filings such as DEF 14A, 424Bx, S-1, 10-K, and 10-Q, as well as Moody's Manuals.

firms restrict ownership of one class of common stocks to citizens of specific countries.[9] Given that these cases do not involve deviation of voting right from cash-flow right, we define them as "non-dual-class" and drop them from the analysis.[10] This category includes 202 firm-years.

2.2 Sample selection

We merge the data set on dual-class firms with those from CRSP and Compustat, from which we obtain information on stock prices and firm-level financials. We require that firm-year observations have the following variables constructed, based on CRSP and Compustat: book assets, Tobin's q,[11] market leverage, research and development (R&D) expenses scaled by sales, asset tangibility, return on assets (ROA), payout ratio, sales growth rate, and SIC codes. We impute missing values of R&D to zero (for a similar adjustment see Brav et al. 2018). Appendix B shows the definitions of the variables. We exclude firms in the financial (SIC 6000–6999), utilities (SIC 4900–4999), and unclassified (SIC 9900–9999) industries. To mitigate the influence of outliers, we exclude firm-years with book assets less than $10 million in 2000 constant dollars (adjusted using CPI) and Winsorize potentially unbounded variables at the 2nd and 98th percentiles.[12] These sample selection criteria give us a final sample of 8,445 firm-year observations, across 920 unique firms, with a dual-class structure from 1971 to 2015. By adding 142,606 firm-years with single-class structures to the sample, we have 151,051 firm-years from 1971 to 2015.

[Insert Figure 2 here]

Figure 2 shows the number of dual-class firm-years with the aforementioned variables from 1971 through 2015, in comparison with the Compustat universe. The fraction of firms with different voting rights across multiple classes of shares ranged between 2.8% and 3.4% before the early 1980s, increased to 6.5% to 7.0% in the early 1990s, and has stayed between 5.4% and 7.0%

[9] For example, Grupo Iusacell, S.A. de C.V. restricts its Class B common stock ownership to Mexican citizens only, whereas their Class A common stock has no ownership restrictions.

[10] An alternative is to treat these firms as de facto single-class firms, which gives a very similar result.

[11] Our baseline measure of q assumes equal prices across classes of stocks issued by a given firm (GIM 2010). The majority of dual-class firm-years in our sample (approximately 85%) have only one class of shares traded (usually the inferior class), making it impossible to observe the market price of the nontraded class of stocks. As robustness checks, we use the traded share price for each class if both classes are traded. If not, we impute the price of the nontraded, superior voting shares in two ways. First, following GIM (2010) we simply apply a 10% premium over the traded, inferior shares of a given firm. Second, we match (based on industry, firm size, and maturity) each dual-class firm with a nontraded class of shares to a dual-class firm with both classes of stocks traded, and use its premium. We find quantitatively similar results using these alternative measures of q. See Section 3.4.2 for details.

[12] We obtain quantitatively similar results by Winsorizing at an alternative level, such as at 1%, 3%, and 5% levels.

since then. The rapid increase in the number of firms with dual-class shares during the 1980s reflects many firms adopting the structure as a takeover defense during the period of high hostile-takeover activities (e.g., Jarrell and Poulsen 1988). We examine market reactions to dual-class recapitalizations in Section 3.3.

[Insert Table 1 here]

Table 1 shows descriptive statistics for the samples of dual- and single-class firm-years. On average, Tobin's *q* of dual-class firms is statistically equivalent to Tobin's *q* of single-class firms. In addition, dual-class firms tend to be larger, older, and more highly levered, and to have higher ROA than single-class firms. They also have lower R&D expenses (scaled by sales) and higher payout ratios than single-class firms.

2.3 Baseline: average relation between dual-class voting and firm performance and valuation

Before turning to our main analysis of dynamic effects of dual-class voting over maturity in Section 3, we describe baseline estimates for the average relation between a dual-class share structure and firm valuation and performance. Appendix C provides detailed explanations of our estimation approach and variables, and Appendix Table A1 shows the estimation results. In general, we find that the average association between the dual-class status and firm performance and valuation is mixed and insignificant. In particular, otherwise similar dual-class firms in the same industry and year have only 0.08 higher *q* (*t*-stat = 1.32). This positive, insignificant association between the dual-class status and valuation differs from previous research, which tends to find a negative association on average (e.g., GIM 2010) due to a difference in sample.[13] However, this average difference in Tobin's *q* between dual- and single-class firms should be interpreted with caution, given that unobserved omitted variables may explain it.

Similarly, the average associations between the dual-class status and measures of operating performance, such as operating margin and labor productivity, are of mixed signs and insignificant. Thus, during the 1971–2015 period, dual-class firms exhibit statistically similar valuation and operating performance to single-class firms with similar characteristics. In the next section, we address a more nuanced issue of how agency costs and firm performance evolve dynamically over dual- and single-class firms' life cycles.

[13] This result is not due to a different variable definition or procedure relative to GIM (2010). When restricting ourselves only to their sample period (from 1995 through 2003) and using the same dependent variables (e.g., log(*q*)), our results are similar to theirs (negative and insignificant coefficients on *Dual*).

3. The Dynamic Effects of Dual-Class Structure

3.1 Voting premium—expected private benefits of control over maturity

An important agency cost associated with a dual-class structure is that insiders (i.e., management and/or controlling shareholders) can extract private benefits of control at the expense of minority shareholders (Burkart and Lee 2008). We hypothesize that these private benefits are smaller for younger, faster-growing firms in which insiders would have stronger pecuniary and nonpecuniary incentives to maximize firm value. This is partly because their payoffs depend much more on future firm value than current consumption of private benefits (as in dynamic agency models such as DeMarzo and Fishman 2007). As firms mature and grow slowly, however, their incentives will tilt toward extracting private benefits from maximizing long-term firm value. In addition, as insiders' ownership of cash flow rights declines over maturity, their incentives to exploit private benefits will increase (e.g., Bebchuk, Kraakman, and Triantis 2000).

We test this prediction by using the voting premium—the difference in market prices between superior voting stocks relative to inferior stocks—as a plausible measure of expected private benefits of control, after controlling for the probability of control contests.[14] This analysis uses a subsample of dual-class firms in our database for which both the superior and inferior classes are publicly traded. To minimize the influence of outliers, we require that a voting premium is less than 100%. The resulting subsample includes 1,337 dual-class firm-years (104 unique dual-class firms) from 1971 to 2015. The mean and standard deviation of voting premiums are 4.16% and 12.82%, in line with estimates reported in previous research (e.g., Zingales 1995). Because we conduct the test on a subsample of dual-class firms where both classes of shares are traded, it is not subject to a bias due to differing selection of firms with dual- vs. single-class voting. On the other hand, it is not a test of relative valuation but rather a test of the dynamics of private benefits, a plausibly important factor in those firms' valuation and performance. We estimate the following regression:

$$VP_{it} = \alpha_t + \beta Maturity_{it} + \gamma' X_{it} + \varepsilon_{it}, \quad (1)$$

where VP_{it} is the voting premium (in percent) for dual-class firm i in year t, computed as $(P_A - P_B)/(P_B - rP_A)$, where P_A (P_B) is the price of the superior (inferior) voting share and r is the

[14] See, e.g., Lease, McConnell, and Mikkelson (1983); Zingales (1995); Nenova (2003); and Doidge (2004). In particular, Zingales (1995) shows evidence that the voting premium is determined by a combination of the probability of control contests and the expected private benefits of control. Similarly, Nenova (2003) argues that the value of control-block votes is a lower bound of the expected private benefits to the controlling shareholder.

relative number of votes of the inferior to superior voting shares; α_t represents year fixed effects; $Maturity_{it}$ is either an indicator equal to one if firm i in year t is older than or equal to 12 years (the median age for dual-class firms in the sample)[15] or sales growth rates; X_{it} includes log market equity, the estimated probability of acquisition (both of which serve as proxies for the probability of hostile takeover),[16] and log relative trading volumes of the superior and inferior classes (Zingales 1995; Nenova 2003); and ε_{it} represents random errors clustered at the firm level. The coefficient of interest is β, which estimates the effect of firm maturity on the voting premium after controlling for the probability of control contests, relative liquidity, and year fixed effects.

[Insert Table 2 here]

Table 2 presents the estimation results for Equation (1). Column (1) in Panel A shows a baseline result that there is a positive association between firm maturity and voting premium. Firms older than or equal to 12 years have a 3.79-percentage-point higher voting premium (significant at the 5% level), which is sizable, given the average voting premium of 4.16%. Column (2) includes year fixed effects and shows an estimate similar to that shown in Column (1) (3.78%). These increasing voting premiums over maturity are after controlling for proxies for the probability of contested acquisitions (i.e., log market equity, estimated probability of takeover), which have predicted signs. To our knowledge, this is the first evidence that the value of voting changes considerably over firm age. This finding suggests that the private benefits of control, presumably one of the main costs of adopting dual-class voting to outside investors, are greater for mature dual-class firms.

In Panel B, we use the sales growth rate as a proxy for a firm's maturity in the life cycle. The panel shows that a voting premium is negatively associated with sales growth, consistent with our prediction that private benefits are larger when firm growth is slower. Estimates in Column (2) that control for year fixed effects indicate that a one-standard-deviation (SD) decrease in sales growth (0.312) is associated with a 0.77 percentage-point increase (= -0.312 × -2.470) in voting premiums. In Column (3) we further include firm fixed effects and find a similar result,

[15] We calculate age either from first appearances in CRSP or Compustat with stock prices or from Compustat IPO dates, whichever is the earliest.

[16] We use log market equity as a proxy for the cost of hostile takeover (Zingales 1995). We compute the estimated probability as the ratio of the number of acquisitions involving dual-class firms from SDC Platinum to the number of dual-class firms in our database by age group of five years (e.g., ages between zero and four, five and nine, etc.).

demonstrating that private benefits increase dynamically as growth slows within firms.[17] Taken together, the results indicate that the agency costs associated with dual-class shares increase with firm maturity.

3.2 Increasing agency costs associated with dual-class voting—the case of dividends

In the previous section, we show evidence that private benefits for controlling shareholders of dual-class firms increase with firm maturity. In general, maturing firms experience a decline in growth opportunities and an increase in agency costs (e.g., Jensen 1986). Unlike shareholders of single-class firms, dual-class firms' shareholders have fewer remedies for agency problems due to their unequal voting power. Thus, it is plausible that agency costs increase more with maturity for dual-class than single-class firms. Theories of dividends and investor protection (e.g., Easterbrook 1984; La Porta et al. 2000; Shleifer and Wolfenzon 2002) suggest that the marginal value of dividend is higher when firms are more mature or investor protection is weaker (e.g., as reflected in dual-class voting), both of which indicate more severe agency problems. Motivated by this class of theories, we test the prediction that the perceived value of dividends, a plausible measure of agency costs, becomes more positive for dual-class than single-class firms as they mature.

We construct a sample for the analysis following Michaely, Thaler, and Womack (1995) and Grullon, Michaely, and Swaminathan (2002). Specifically, we begin with all US firms listed on the NYSE, AMEX, and NASDAQ from 1971 to 2015 in CRSP that either initiate or increase dividends. We require that (1) a quarterly taxable cash dividend either increases by 25% to 500% (to ensure that the change is economically meaningful and to exclude outliers) or is initiated (i.e., the first dividend payment reported on CRSP); (2) the firm has been traded on one of the three US exchanges in the previous two years in the case of dividend initiation; and (3) the announcing firm is not in the financial, utilities, or unclassified industries. We compute excess daily stock returns using the following market-adjusted-return model:

$$\varepsilon_{it} = R_{it} - R_{mt} \tag{2}$$

from day -1 to day +1 (e.g., Michaely, Thaler, and Womack 1995), where ε_{it} is the rate of excess return and R_{it} is the rate of stock return for firm i on day t, and R_{mt} is the rate of return for the market portfolio ("vwretd" from CRSP). We compute cumulative abnormal returns (CARs) during

---

[17] We do not use a specification that includes both firm and year fixed effects in Panel A, given that the *Mature* indicator becomes nearly collinear with year fixed effects within firms. In Panel B in which the key independent variable is sales growth, we do not have this issue.

the [-1, +1] window around the announcement by compounding the daily excess returns.[18] Requiring CARs as well as firm-level characteristics (see below) provides a sample of 5,509 dividend increases and initiations announced by dual- and single-class firms from 1971 to 2015 (among which 183 are for dual-class firms).

Using this sample, we examine whether the perceived value of dividends increases for dual-class relative to single-class firms over maturity by estimating the following regression equation:

$$CAR_{it} = \alpha_{jt} + \beta_1 Dual_{it} + \beta_2 Mature_{it} + \beta_3 Dual_{it} \times Mature_{it} + \gamma' X_{it} + \varepsilon_{it}, \quad (3)$$

where CAR_{it} is the CAR for dividend increases and initiations for firm i in year t; α_{jt} represents three-digit SIC industry (indexed by j) by year fixed effects; $Dual_{it}$ is an indicator variable equal to one if firm i has a dual-class share structure in year t; $Mature_{it}$ is an indicator equal to one if firm i in year t is older than or equal to 12 years, and zero otherwise; and X_{it} is a vector of control variables including log book assets, Tobin's q, and ROA. ε_{it} represents random errors clustered at the firm level. The coefficient of interest is β_3, which represents the effect of a dual-class structure on the perceived value of dividends for mature firms relative to young firms.

[Insert Table 3 here]

Table 3 shows the estimation results for Equation (3). The significantly negative coefficients on *Dual* (e.g., -2.257 in Column (2)) indicate that increasing or initiating dividends is perceived more negatively for young dual-class than single-class firms. A plausible explanation for this finding is that young dual-class firms suffer less agency problems than young single-class firms. Importantly, the significantly positive coefficients on *Dual* × *Mature* (e.g., 3.778 in Column (2)) indicate that as firms mature, an incremental dividend is perceived more valuable for dual-class firms than single-class firms, controlling for industry-by-year fixed effects and time-varying firm characteristics. We also find consistent results when we adjust CARs for the magnitude of dividend changes (for the cases of increases) by including a percentage change in dividend as a control (Column (3)) or by scaling the CAR by a dividend change (Column (4)). These results support the prediction that as firms mature, paying out dividends becomes more valuable to firms with dual-class structures relative to single-class ones, presumably due to the increasing (agency)

[18] The results are robust to alternative event windows such as [-3, +3], [-2, +3], and [-1, +2].

costs of withholding cash to external shareholders (La Porta et al. 2000; Shleifer and Wolfenzon 2002; Grullon, Michaely, and Swaminathan 2002; DeAngelo, DeAngelo, and Stulz 2006).

3.3 Market reactions to dual-class recapitalizations and unifications over maturity

The previous two sections show evidence that agency costs associated with dual-class structures increase with maturity, suggesting the net benefits of dual-class voting also decline over maturity. The declining net benefits could manifest in different aspects of valuation. In our first test, we examine how the market reacts when single-class firms announce a switch to dual-class voting (called a 'dual-class recapitalization') and vice versa (when dual-class firms announce a switch to a single-class structure, called a 'share unification'). In particular, we estimate how market reactions to these events differ across young and more mature firms. If the value of dual-class voting declines over maturity, we hypothesize that for mature firms, dual-class recapitalizations will be associated with lower returns whereas share unifications will be associated with higher returns, other things held constant. One advantage of this analysis is that it uses market returns and thus is able to sidestep possible measurement errors in q, particularly those related to measuring the replacement cost of assets. In our second test, we examine dynamics of Tobin's q (see the next section).

We construct a sample of dual-class recapitalization announcements as follows. We begin with all single-class firms in our data that switch to dual-class firms from 1971 to 2015. Specifically, we examine the first year of all dual-class firms in our data from Moody's Manuals and the SEC's EDGAR to identify whether they become dual-class firms either at or after IPO, and exclude dual-class IPO firms. For these events of dual-class recapitalization, we collect the announcement date from two sources. First, we use announcement dates provided by Partch (1987) and Jarrell and Poulsen (1988) for the 1971–84 and 1976–87 periods, respectively. They use a combination of the date in which proxy materials are mailed to shareholders and the date in which the *Wall Street Journal* or *Dow Jones Ticker* reports a recapitalization plan. Second, we complement and refine these dates by our own news collection using Factiva following Jarrell and Poulsen's (1988) approach. If we find news articles on recapitalizations that precede those reported by Partch (1987) and Jarrell and Poulsen (1988), we use the earlier date as the event date.[19] We exclude events that are confounded by announcements of other major corporate events, such as

[19] The difference in event dates between Partch (1987) and Jarrell and Poulsen (1988) and our data collection is typically within one to two days, although it can be up to 59 days.

dividend declaration, M&A, and other restructurings (e.g., emergence from bankruptcy). When an announcement date for a plan is not available from these sources, we use the date in which a firm announces the voting outcome on recapitalization in major news outlets.

Using this sample of dual-class recapitalizations, we compute excess daily stock returns using the market-adjusted-return model in Equation (2). Given the imprecision of the event date as explained above, we compute CARs over the [-3, +3] window.[20] Following Jarrell and Poulsen (1988), we include financial, utilities, and unclassified firms to increase the sample size. Finally, requiring CARs provides a sample of 88 dual-class recapitalizations announced by single-class firms between 1971 and 2015. These recapitalization announcements are highly clustered between 1983 and 1987, when hostile takeover activity was most heightened (see also Figure 2 for an increase in the fraction of public firms with dual-class structures during the period).

We estimate a version of Equation (1) that uses CARs for dual-class recapitalization announcements as the dependent variable and includes a *Mature* indicator and year fixed effects. We thus identify the differential effect of dual-class voting on young (i.e., age less than 12 years) and mature firms by comparing market value changes in response to recapitalizations in a given year for firms with different maturity. To the extent that firms recapitalizing to a dual-class structure in a given year are comparable with each other (other than maturity), the coefficient on *Mature* would capture the incremental effect of dual-class voting for mature relative to young firms. We cluster standard errors at the year level to account for sample clustering due to temporal variation in the perceived value of dual-class voting.

[Insert Table 4 here]

Columns (1) and (2) in Table 4 present the estimation results. Positive regression constants (2.62% and 3.47%, significant at the 5%–10% level) indicate that the market perceives a positive effect of dual-class structures on young firms. This finding is in stark contrast to the insignificant announcement effects documented in previous research (e.g., Partch 1987; Jarrell and Poulsen 1988). However, the negative coefficients on *Mature* (-3.38% and -4.64%, significant at the 10% level) indicate that when mature firms announce the switch, the CAR is lower than the case of young firms. This is the first evidence that the market reaction to dual-class recapitalizations varies conditional on firm maturity, and is consistent with declining net benefits of dual-class voting over maturity.

[20] We find a qualitatively similar result by using alternative event windows such as [-2, +2] and [-2, +3].

Next, we examine the market's reaction to the announcement of dual-class unifications. Given that no existing research examines this event, we collect our own data by identifying whether each firm's terminal year as a dual-class firm is due to share unifications using SEC filings, Moody's Manuals, and CRSP delisting codes. After identifying unification events, we search for news articles that announce these switches in major news outlets using Factiva. This procedure produces 62 share unifications announced by dual-class firms from 1971 to 2015.

We estimate a version of Equation (1) that uses CARs for dual-class unification announcements as the dependent variable and includes a *Mature* indicator and year fixed effects. Columns (3) and (4) in Table 4 present the estimation results. The positive coefficient on a *Mature* indicator in Column (4) (4.97%; t-stat = 2.52) shows that the market perceives a more positive value effect when a mature firm eliminates its dual-class voting compared with a young firm that makes such a switch in the same year. In contrast, the insignificant regression constants (0.30% and -0.61%) indicate that there is no market reaction to young firms making such a switch. Interestingly, the economic magnitudes of the value effect of dual-class structures on mature firms (relative to young firms) estimated using recapitalizations and unifications are similar (e.g., 4.64% and 4.97% in Columns (2) and (4), respectively). Thus, the overall evidence in this section is consistent with dual-class voting becoming less beneficial on net over firm age.

3.4 Firm maturity and dynamics of Tobin's *q*

We now examine whether the effect of a dual-class structure on valuation changes dynamically as firms mature by estimating the following regression equation:

$$q_{it} = \alpha_{jt} + \beta_1 Dual_{it} + \beta_2 Mature_{it} + \beta_3 Dual_{it} \times Mature_{it} + \gamma' X_{it} + \varepsilon_{it}, \qquad (4)$$

where q_{it} is Tobin's q for firm i in year t; X_{it} is a vector of control variables including log book assets, market leverage, R&D expenses scaled by sales, asset tangibility, sales growth rates, ROA, and payout ratio; and all other variables are defined as in Equation (3).

Column (1) in Table 5, Panel A presents the baseline result of estimating Equation (4) using the full sample. It shows that the coefficient on *Dual* is 0.200 (t-stat = 2.61). This suggests that adopting a dual-class structure is associated with higher firm valuation compared with adopting a single-class structure for relatively young firms, conditional on being in the same industry and year and having similar observable firm characteristics. However, this coefficient should be interpreted with caution, given potential omitted-variable bias. Importantly, the estimate for *Dual* × *Mature* is -0.216 (t-stat = -2.51), suggesting that as firms become more mature, having a dual-class share structure is associated with an increasingly larger valuation discount compared with having single-class shares.[21] In terms of economic magnitude, relative to the average Tobin's q of 2.074, mature dual-class firms lose 10.3% (= 0.216/2.074) more valuation as they become older than or equal to 12 years compared to single-class firms. Given that we include a *Dual* indicator that controls for fixed differences in Tobin's q between dual- and single-class firms, this finding is consistent with having a dual-class structure becoming dynamically costlier to minority shareholders as firms mature. We find a quantitatively similar result using GIM's (2010) definition of Tobin's q (see Appendix Table A2, Column (1)).

[Insert Table 5 here]

Figure 3 visually shows the relation between firm age and Tobin's q separately for dual- and single-class firms. We estimate a version of Equation (4) in which we replace *Mature*, *Dual*, and *Dual* × *Mature* with $\sum_{k=1}^{25} d[age = k]$ and $\sum_{k=0}^{25} Dual \times d[age = k]$, where *d[age = k]* is an indicator equal to one if firm age = k ($0 \leq k \leq 25$), and zero otherwise. Dual-class firms trade at a premium relative to single-class firms for ages between zero (at IPO) and 11, after which they trade on par with their single-class counterparts. The coefficients on *Dual* × *d[age = k],* $0 \leq k \leq 11$ are jointly different from zero at the 10% level. The figure suggests that the particular cutoff we employ does not affect our finding of the decline in relative valuation as dual-class firms mature.

[Insert Figure 3 here]

One concern for the analyses in Column (1) of Table 5, Panel A, and Figure 3 is that the effect of covariates on Tobin's q may be nonlinear and thus an OLS regression does not fully control for differences between dual- and single-class firms (see Table 1). To address this concern, we re-estimate Equation (4) using a matched sample. Specifically, for each dual-class firm-year in our sample, we find a matched single-class firm-year with the closest propensity score by estimating a probit regression that uses all firm-level covariates as in Equation (4) within a given three-digit SIC industry and year. To maintain match quality, we require that the difference in log odds ratios is less than 0.50, and if we are unable to find a suitable match within a three-digit SIC-year cell, we move on to a two-digit SIC-year cell to find a match. This procedure leads to 6,279 dual-class firm-years with matched single-class firm-years (= 74.4% of 8,445 dual-class firm-years in the sample). We find that all covariates are statistically similar between the matched dual- and

[21] We find that dual-class firms' assets grow more slowly than single-class firms' assets as they mature (unreported), suggesting that the faster decline in Tobin's q is not mechanically driven by faster growth in dual-class firms' assets.

single-class firms (unreported). Column (2) presents the estimation results using the matched sample and reveals a similar story to Column (1). That is, dual-class firms have higher valuation when they are younger than 12 years but experience a greater decline as they mature, relative to single-class firms.

A potential concern regarding the results in Columns (1) and (2) is that dual-class firms with different ages may be of different cohorts, subsequently driving the difference in valuation we find. For example, a significant portion of mature dual-class firms in our sample are likely family-controlled firms that went public earlier in the sample period (e.g., Villalonga and Amit 2009), whereas many of the young dual-class firms that went public later in the sample period are managed by entrepreneurs and in the technology industries. We address this concern in several ways. First, we add dual-class-by-IPO cohort (defined by decades of IPOs) fixed effects to Equation (4) to control for potentially heterogeneous valuation gaps between dual- and single-class firms across different cohorts (e.g., firms IPOed in the 1980s versus in the 2000s). In Column (3), which controls for these fixed effects, the coefficient on *Dual* × *Mature* is -0.182 and significant at the 10% level. Thus, heterogeneity across cohorts of dual-class firms does not appear to be a driver of the baseline result.

Second, we re-estimate Equation (4) by restricting our sample to firms that went public before 2003, in which the most recent cohorts of IPOs are excluded and all firms have observations with ages higher than or equal to 12 (unless they disappear from the sample). The estimates shown in Appendix Table A2, Column (3), are virtually identical with our baseline estimates (Column (1) in Panel A of Table 5). Third, as shown in Column (4) of Table 5, Panel A, we find a similar result estimating a version of Equation (4) that includes firm fixed effects (details are below). Given that identification is achieved off of within-firm variation only in Column (4), the estimate is by construction immune to across-cohort heterogeneity.

3.4.1 Sample selection bias

An important concern for the results so far is that a different sample selection between dual- and single-class firms could drive our "dynamic effect" of dual-class voting. In particular, one could argue that the greater decline in valuation over maturity for dual-class firms is due in part to different selection of firms that choose to IPO with dual- vs. single-class structures. For example, IPO candidates with higher growth potential and hence valuation could have the "bargaining power" to set up a dual-class structure before an IPO, and their valuation mean-reverts faster relative to single-class firms post-IPO. We address this concern in two ways.

First, we control for any fixed difference across firms by employing firm fixed effects. By including firm fixed effects to estimate Equation (4), we rely on within-firm valuation dynamics over maturity, as opposed to across-firm variation. Thus, we require that firms maintain the same voting structure (i.e., either of single- or dual-class) for at least 25 years and that they exist both before and after 12 years of age in this analysis. These additional criteria produce a subsample of 44,196 firm-years.[22] Column (4) shows that the coefficient on *Mature* is -0.067 and significant at the 10% level, indicating that Tobin's *q* generally decreases within firms as they age. Importantly, the coefficient on *Dual* × *Mature* is -0.258 and significant at the 10% level, implying that within firms, valuation decreases with age more for dual-class than for single-class firms. The economic magnitude of the within-firm, dynamic effect (an additional 0.258 drop in Tobin's *q* for dual-class firms older than or equal to 12 years) is comparable with estimates without firm fixed effects in previous columns (e.g., -0.216 and -0.283 in Columns (1) and (2), respectively).

Second, we construct another matched sample of dual- and single-class firms at their IPOs. Specifically, we estimate propensity scores for dual- and single-class IPOs in the same industry (defined at the three- to one-digit levels) and year using Tobin's *q* and firm size, proxied by log book assets. Then, we find a matched single-class IPO with the closest propensity score for each dual-class IPO in the same industry and year. We construct a new panel of firms by following these matched firms up to age 25. Column (5) shows the result of estimating Equation (4) using this IPO-matched sample. By construction, dual- and single-class firms in this sample have statistically equivalent Tobin's *q* at IPO (*t*-stat = 0.35) and when they are younger than 12 years in general (*Dual* = 0.080; *t*-stat = 0.63). Importantly, the estimate on *Dual* × *Mature* (-0.421; *t*-stat = -1.79) shows that the valuation of dual-class firms declines more than their single-class counterparts over maturity, controlling for time-varying industry shocks and firm characteristics. Thus, this analysis mitigates the concern that our baseline results are due to a sample selection in which dual- and single-class firms have different valuation levels and growth potentials at IPOs.

In addition, we address another issue related to sample selection, namely different sample attrition rates for dual- and single-class firms. In our data, single-class firms tend to be delisted more often than dual-class firms (as proxied by attrition from Compustat). For example, among

[22] In this analysis, the standalone indicator *Dual* drops out because it is perfectly collinear with firm fixed effects.

firms that are in Compustat at age three, 12.3% and 44.6% of dual-class firms leave the sample by ages 13 and 25, whereas 19.5% and 57.3% of single-class firms leave. If the sample attrition rate is correlated with firm value or performance (e.g., well performing firms disappear more often due to, for example, acquisition), then our estimates for changes in valuation based on observed data could be biased.

We address this sample attrition issue using Heckman's (1979) two-step procedure to adjust for sample selection. Specifically, we first estimate a probit model of firms remaining in the sample using the same set of covariates in Equation (4), a *Dual* indicator, and an instrumental variable. In the second step, we estimate the following variant of Equation (4):

$$\Delta q_{it} = \alpha_t + \beta Dual_{i0} + \gamma' X_{i0} + \delta H(\lambda' X_{i0} + \mu' Z_{i0}) + \varepsilon_{it}, \quad (5)$$

where Δq_{it} is the change in Tobin's *q* from the average between ages zero and 11 to ages *k* (where $12 \leq k \leq 25$) for firm *i* in year *t*; α_t represents year fixed effects; $Dual_{i0}$ is an indicator variable equal to one if firm *i* has a dual-class share structure, and zero otherwise; X_{i0} is a vector of covariates in Equation (4) that are averaged across ages zero to 11; Z_{i0} represents an instrumental variable (IV) that affects the propensity of remaining in the sample but has no direct relation to changes in valuation, averaged across ages zero to 11; and *H(.)* is the inverse Mills ratio (hazard function) for remaining in sample. Motivated by an extensive literature showing that market liquidity is an important benefit of going public (e.g., Brav, Jiang, and Kim 2009; Lowry, Michaely and Volkova 2017), we use the log turnover rate, defined as the average daily trading volume scaled by the number of shares outstanding (averaged across ages zero to 11) as the instrument (Z_{i0}).[23] There is no a priori reason for trading liquidity to affect future changes in firms' valuation directly. In fact, if trading liquidity matters for valuation changes, the effect must go through the channel of public listing. Therefore, the instrumental variable likely satisfies the exclusion restriction. We estimate the first- and second-stage regressions using a subsample of firm-years with ages between 12 and 25 for firms that went public in 1990 or before. This sample selection ensures that a terminal year in the database is due to delisting, as opposed to sample truncation (in 2015).

[23] Strictly speaking, an instrumental variable (Z_{i0}) in Equation (5) is not required to identify the Heckman selection model, as long as the error terms in the equation and selection equation are jointly normally distributed and the inverse Mill's ratio is thus nonlinear. However, given that the inverse Mill's ratio could be approximately linear in parts of its domain in practice, we use the liquidity measure as an IV to identify the selection model properly (see, e.g., Li and Prabhala 2007).

Appendix Table A3 shows the results of estimating the first-stage selection equation, in which the dependent variable is an indicator equal to one if a firm-year remains in the CRSP/Compustat database, and zero otherwise. Consistent with dual-class firms remaining in the sample more than single-class firms, the coefficient on *Dual* is positive and significant at the 1% level. Importantly, the coefficient on *Log turnover rate*, a measure of liquidity and the instrument, is positive and significant at the 1% level, suggesting that high market liquidity is associated with a high probability of remaining in the stock market.

Column (6) in Table 5 shows the results of estimating the second-stage regression in Equation (5). The coefficient on the inverse Mill's ratio is -1.908 and significant at the 1% level, indicating that firms with a higher propensity to remain in the sample have a worse prospect in changes in Tobin's *q*. Thus, to the extent that this sample selection bias affects single-class firms (for which the sample attrition rate is higher) more than dual-class firms, not correcting for the sample selection would bias downward (in absolute magnitude) estimates for the dynamic effect of the dual-class structure on valuation.[24] After controlling for this sample selection pattern, we continue to find a significantly negative effect of dual-class voting on changes in *q* as firms mature (coefficient on *Dual* = -0.431; *t*-stat = -2.27).

3.4.2 Measurement issues for Tobin's *q*

In this subsection, we address issues concerning measurement of Tobin's *q*. Our baseline definition of *q* assumes equal prices across classes of stocks for dual-class firms (e.g., GIM 2010). To examine the robustness of our results to this assumption, we construct alternative measures of *q* as follows. If the superior voting shares are traded (for approximately 15% of dual-class firms), we use observed price premiums for the superior relative to inferior voting shares. But if superior voting shares are not traded, we impute their price in one of the two ways. First, following GIM (2010) we apply a 10% premium over the traded, inferior shares of a given firm. Second, we use premiums of a matched (based on industry, firm size, and maturity) dual-class firm with both classes of stocks traded. Appendix Table A2, Columns (4) and (5) show that the estimates using these alternative measures of *q* are very similar to the baseline case (*Dual* × *Mature* = -0.200 and -0.192) and significant at the 1% level. Another concern for the baseline measure of *q* is that the book value of capital does not fully account for intangible capital, which is particularly important

[24] In fact, we find that market liquidity, the instrument in the first stage, significantly affects the probability of remaining in the sample for single-class firms but not for dual-class firms (unreported).

for young, high-growth firms. We address this issue by employing "total *q*," which captures book value of both tangible and intangible capital, as constructed by Peters and Taylor (2017). Estimates shown in Appendix Table A2, Column (6) indicate that the dynamics of *q* between dual- and single-class firms are similar using this measure (*Dual* × *Mature* = -0.212; *t*-stat = -2.64).

3.4.3 Growth rate as alternative proxy for maturity

Other proxies for firm maturity than age (since IPO) may be used to gauge the net benefits of a dual-class structure. To illustrate, in Panel B of Table 5 we explore sales growth rates (over the previous year), instead of a *Mature* indicator based on firm age, as an alternative proxy for firm maturity. Columns (1) and (2) show that dual-class firms' *q* is lower than otherwise similar single-class firms, particularly when firm growth is slower. In terms of economic magnitude, the coefficient on *Dual* × *Sales growth* in Column (1) (0.138) suggests that a one-SD decrease in sales growth (64.4%) is associated with Tobin's *q* that is 0.089 (= 0.138 × 0.644) lower for dual-class firms relative to single-class firms.

In sum, the analysis above shows that dual-class firms' valuation declines more than single-class firms' over firm maturity, controlling for time-varying industry shocks, firm characteristics, time-invariant differences across firms and IPO cohorts, and when accounting for sample selection issues. More broadly, the evidence that the value impact of dual-class voting decreases with firm maturity, whether it is proxied by firm's age or by growth, has implications for other control-enhancing mechanisms such as pyramids and cross-ownerships, which are commonly used outside the US. Our results suggest that an optimal governance structure for outside shareholders would involve reducing or dismantling pyramids and cross-ownership structures as firms within business groups mature. However, this type of governance overhaul would be difficult to implement ex post, given conflicting interests between inside and outside shareholders, consistent with the fact that ownership and control do not become dispersed for mature firms with these structures (e.g., Claessens, Djankov, and Lang 2000). Thus, the solution should be in the contract ex ante (see Section 5), regulations, or pressure from activist investors.[25]

4. Plausible Mechanisms behind the Dynamic Effects of Dual-Class Voting

[25] As of this writing, a few large business groups in South Korea ("Chaebols") are going through governance overhauls that will essentially eliminate complex cross-ownership structures, partly pushed by the regulators and activist investors. See, e.g., "Hyundai group to streamline ownership structure in reform push," Reuters, March 28, 2018.

4.1 Operating performance

In this section, we start exploring channels underlying the increasing agency costs and declining valuation associated with dual-class voting over firm maturity. We first examine whether dual-class firms exhibit poorer operating performance than single-class firms as they mature by estimating a version of Equation (4), which uses a measure of operating performance as the dependent variable. Column (1) of Table 6 shows significantly positive coefficient on *Dual* and negative coefficient on *Dual* × *Mature*, suggesting that young dual-class firms have higher margins than their single-class counterparts but their margins deteriorate more than those of single-class firms as they mature. Column (2) shows that young and mature dual-class firms and single-class firms exhibit similar levels of asset turnover, a measure of capital efficiency. Column (3) shows the results for how a dual-class share structure is associated with firm-level labor productivity, as measured by sales (a proxy for firm-level output) scaled by the lagged number of employees.[26] The insignificant coefficient on *Dual* indicates that young dual- and single-class firms produce similar levels of output with a given number of employees. However, labor productivity deteriorates to a greater extent for dual-class firms than for single-class firms as they mature (*Dual* × *Mature* = -0.102; *t*-stat = -2.51). Overall, Table 6 results imply that deteriorating operating margins and labor efficiency partly explain declining valuation associated with dual-class structures.

[Insert Table 6 here]

4.2 Firm maturity and the benefits of dual-class structure—technological innovation

The analysis above provides evidence that the overall performance of dual-class firms declines as they mature relative to single-class firms, which coincides with increasing private benefits for controlling shareholders and agency costs in general. Could this decline in performance also be due to decreasing benefits of a dual-class structure over a firm's life cycle? Stein (1988, 1989) argues that, when pressured by capital markets, corporate managers may aim to boost short-term profits at the expense of long-term value. He further predicts that this distortion ("short-termism") is more pronounced when information asymmetry between managers and outside investors (regarding, e.g., quality of investments) is more severe, which is likely the case for young firms. Consistent with this prediction, managers of young technology firms argue that

[26] See, e.g., Davis et al. (2011) and Brav, Jiang, and Kim (2015), who employ similar measures of labor productivity using establishment-level data.

dual-class voting provides important protection from capital market pressure, particularly fixation on short-term earnings. They claim that this protection enables them to invest in long-term, innovative projects that external shareholders might not fully appreciate.[27] However, this protection will become less beneficial as firms mature, growth opportunities decline, and information asymmetry between managers and outside shareholders decreases.

Despite these arguments from both theory and practice, there is limited evidence for how adopting dual-class voting affects firms' investment in long-term projects, particularly over life cycles. We shed light on this issue by studying dynamics of the corporate innovation process in relation to the dual-class structure. Specifically, we test the prediction that the pace of innovation as measured by patents will decline over maturity for dual-class relative to single-class firms using a patent data set compiled by Kogan et al. (2017) merged with our database.[28] The data set provides information on approximately 6.2 million patents granted from 1926 to 2010 obtained from Google Patents. For this analysis only, we require that firms have filed for at least one patent during the sample period (see, e.g., Brav et al. 2018). Following the literature, we impute missing values of the number of patents and citations as zero. In addition, we follow Hall, Jaffe, and Trajtenberg (2001) and adjust each firm's last few years of observations for undercounting in these measures using the application- and citation-lag distributions computed from knowledge obsolescence-diffusion parameters.

Table 7 presents the results of estimating Equation (4), which uses a measure of patent output as the dependent variable. Columns (1) and (2) use the log of (one plus) the numbers of patents filed by firms in one and two years ahead as the dependent variable, and show that the coefficients on *Dual* × *Mature* are significantly negative at the 5% level. This finding suggests that with maturity, the pace of innovation declines more for dual-class firms relative to otherwise similar single-class firms. The estimate in Column (1) suggests that as firms mature, (one plus) the number of patents produced by dual-class firms decreases 27.0% (= exp(-0.315) – 1) more relative to single-class firms. Columns (3) and (4) examine how dual-class voting affects the quality of patents, measured by the log of (one plus) the number of citations, conditional on firm age. In both columns, the estimates for *Dual* × *Mature* are significantly negative at the 5%–10% level. In

[27] See Appendix A, which provides excerpts from Google's IPO prospectus in 2004 and Facebook's statement in 2016 to announce the creation of Class C shares with no voting rights. Both examples emphasize the benefits of dual-class structures that allow firms to focus on long-term investments and value.

[28] We thank Noah Stoffman for making the patent data set available.

particular, Column (3) implies that patents produced by dual-class firms lose their impact 23.3% (= exp(-0.265) – 1) more than single-class firms as firms age. Columns (5) and (6) use the fraction of patents in the top tercile of citation within a patent class and year ("Top") as the dependent variable, and show similar evidence that patents generated by dual-class firms become less impactful over maturity, relative to those by similar single-class firms.

[Insert Table 7 here]

Thus, over the life cycle, there appears to be a decline in the benefit of a dual-class structure, namely protection from capital market pressure, which allows firms to invest in long-term projects such as innovation. This may partly explain the valuation decline over dual-class firms' life cycle relative to their single-class counterparts.

4.3 Systematic risk and agility

Increasing agency problems associated with dual-class voting may also manifest in firms' risk profiles, in addition to voting premiums and the perceived value of dividends examined in Section 3. For example, managers of mature dual-class firms may be reluctant to cut their workforce or liquidate assets in response to negative shocks if they enjoy private benefits in maintaining existing operations or simply a "quiet life" (e.g., Morck, Stangeland, and Yeung 1998; Bertrand and Mullainathan 2003). In a neoclassical asset-pricing framework, these increased downward adjustment costs for capital and labor would lead to higher cash flow risk (e.g., Zhang 2005; Cooper 2006). The intuition is that firms with higher adjustment costs generate lower cash flows in bad times when the price of risk is high, and thus carry higher risk premiums. Therefore, we explore the links between mature dual-class firms' adjustment costs and systematic risk by examining (1) the sensitivity of investment and employment decisions to investment opportunities (Section 4.3.1) and (2) asset-pricing factor loadings over maturity (Section 4.3.2). Ultimately, through these analyses, we aim to provide evidence that increasing cash-flow risk (partly) explains declining market valuation of firms over maturity associated with dual-class voting.

4.3.1 Agility: Investment and employment decisions

We first estimate how the q-sensitivity of investments and employment varies over maturity separately for dual- and single-class firms. The neoclassical models suggest that investment- and employment-q sensitivities could be interpreted as an inverse proxy for the convex portion of capital and labor adjustment costs (e.g., Abel and Eberly 1994; Peters and Taylor 2017). Following the large body of research on corporate investment, we use Tobin's q as a proxy for marginal q and also include cash flows (scaled by lagged assets) in the investment equation.[29] In addition to investment (in capital), we analyze employment changes as a proxy for investment in labor (e.g., Bloom 2009). The resulting investment or employment equation is:

$$Investment_{it} = \alpha_i + \alpha_t + \beta_1 q_{it} + \beta_2 CF_{it} + \varepsilon_{it}, \qquad (6)$$

where $Investment_{it}$ is either capital expenditures scaled by lagged assets or employment growth rates from the previous year; α_i and α_t represent firm and year fixed effects; q_{it} is Tobin's q, a proxy for marginal q; CF_{it} is cash flow scaled by lagged assets for firm i in year t; and ε_{it} represents random errors clustered at the firm level.

To examine whether dual-class firms exhibit different capital and labor adjustment costs compared with single-class firms conditional on maturity, we estimate Equation (6) separately for four subsamples of dual- and single-class firms with different maturity (split at the median age of 12).[30] Furthermore, given the importance of downward adjustment costs as a source of systematic risk (Zhang 2005), we compare these sensitivities by focusing on subsamples in which firm-level demand conditions are "low" using sales growth rates as a proxy for demand conditions (e.g., Achyuta, Chari, and Sharma 2013). In particular, we estimate Equation (6) using subsamples with sales growth in the first quartile (less than -2.4%) or in the bottom 5% (less than -38.0%).

[Insert Table 8 here]

Panel A of Table 8 reports the estimation results for Equation (6), comparing sensitivities of investment and employment changes between young and mature dual-class (vs. single-class) firms when the sales growth rate is in the first quartile. The bottom row in Columns (1) and (2) shows that the coefficient on $q \times$ *Dual* is significantly smaller (at the 10% level) for capital expenditure among mature firms than young firms. Similarly, the bottom row in Columns (3) and (4) shows that the coefficient on $q \times$ *Dual* is smaller (yet insignificantly) for employment growth among mature (versus young) firms. These results support the prediction that capital and labor adjustment costs increase more with maturity for dual-class firms than single-class firms, especially when low demand conditions indicate that downward adjustments may be optimal. In contrast, we find that the difference in coefficients on $q \times$ *Dual* is relatively small and insignificant when sales growth is in the second to fourth quartiles (unreported). Panel B uses a subsample of

[29] See, e.g., Kaplan and Zingales (1997) and Hubbard (1998).
[30] In practice, we estimate a version of Equation (6) that interacts the *Dual* and *Mature* indicators with q and cash flow, as well as firm and year fixed effects.

firms with sales growth rates less than the 5th percentile. Again, Columns (1) and (2) show that the coefficients on $q \times Dual$ are smaller among mature than young firms for investment (*t*-stat = -1.09) and employment changes (*t*-stat = -4.06). Overall, these results are consistent with the prediction that dual-class firms exhibit higher downward adjustment costs as they mature.

4.3.2 Systematic risk

Another testable implication of the aforementioned theories is that firms with high adjustment costs will exhibit characteristics of value firms (Zhang 2005; Cooper 2006). Specifically, mature dual-class firms will have higher HML factor loadings than mature single-class firms, which could imply higher costs of capital for the former. We test this prediction by estimating a Fama-French-Carhart (Fama and French 1993; Carhart 1997) four-factor model using a zero-cost calendar-time portfolio that longs dual-class firms and shorts matched single-class firms in each month from 1971 through 2015 (45 years = 540 months). To avoid picking up a mechanical effect of book-to-market ratios on factor loadings (HML in particular), for each dual-class firm-year we find matched single-class firm-years in the same Fama-French 48 industry and year with book-to-market ratios within a [0.85, 1.15] bandwidth. Importantly, we split the full sample into two at the median firm age for dual-class firms (12 years) and report the regression results separately for relatively young and mature firms. Table 9 presents the estimation results for value- (Panel A) and equal-weighted (Panel B) portfolios.

[Insert Table 9 here]

Column (1) in both panels shows that on average, zero-cost portfolios that long dual- and short single-class firms exhibit positive loadings on the HML ("value") factor (0.045 and 0.072, respectively). Importantly, Columns (2) and (3) show that dual-class (vs. Tobin's *q*-matched single-class) firms have significantly positive HML factor loadings among relatively mature firms (0.112 vs. -0.096 in Panel A; 0.089 vs. 0.050 in Panel B), but not among young firms. This differing factor loading between mature dual- and single-class firms is consistent with mature dual-class firms co-moving more with high book-to-market firms and thus carrying a higher risk premium.

Overall, results from this section suggest that relative to mature single-class firms, mature dual-class firms are riskier as their adjustment of capital and labor is less sensitive to economic shocks. We further find evidence for an increase in systematic risk (a "discount-rate channel"), which partly explains the decline in valuation impact of dual-class structures over maturity that we demonstrated above.

5. Discussion and Policy Implications

Results from the variety of tests above suggest that the net benefit of adopting a dual-class share structure declines over firm maturity, whether proxied by a firm's age or by its growth. The differential value impact of dual-class voting on mature versus young firms is corroborated by dynamics of voting premiums, market reactions to dividend announcements and Tobin's q for dual- and single-class firms, as well as by differences in their profit margins, productivity, innovative output, and risk dynamics over maturity. Further, our estimates in Table 3 indicate that for a typical mature dual-class firm, switching to a single-class structure would be associated with an additional increase in firm value by 3%–5%, relative to the case of young firms.

A natural question is why dual-class firms do not switch to single-class voting more frequently when they mature. If controlling shareholders can credibly promise such a switch a priori, it could increase firm value ex ante. However, such promises are time inconsistent because controlling shareholders would be unwilling to relinquish power ex post, especially if private benefits are large, even when dual-class voting is no longer optimal to outside shareholders. This private incentive for insiders suggests that the solution should be embedded in the contract ex ante, perhaps in the form of a sunset provision. In this context, a sunset provision is a clause in statutes (e.g., articles of incorporation) that triggers an automatic repeal of the dual-class status once a specific date is reached or a specific event occurs.

To explore sunset provisions as a potentially effective mechanism to mitigate dynamic agency problems associated with dual-class structures, we first document the usage of sunset provisions by US firms. In particular, we collect information on sunset provisions used by 373 dual-class firms in our sample that went public from 1994 to 2015 by examining security filings from the SEC's EDGAR (e.g., S-1s, DEF 14As). Based on these filings, we classify sunset provisions for dual-class structures into provisions that condition on (1) a fixed period of time since the IPO, (2) transfer of ownership of superior shares from insiders to third parties, (3) a decrease in the collective ownership of an insider group below a threshold level, and (4) others.

We find that, perhaps surprisingly, 66.2% (= 247/373) of firms that went public with dual-class shares have at least one type of sunset provision. At first glance, it may seem that a majority of firms with dual-class shares would unify shares into one class at some point post-IPO. However, we find that the majority of these sunset provisions are either of the aforementioned second (212 firms, or 56.8%) or third type (86 firms, or 23.1%).[31] Given that these two types of provisions require the insider group's intention to relinquish its control or even death of the insiders, it is unlikely to be triggered in practice. Consistent with this conjecture, only a small fraction of firms with provisions (2) and (3), 37 of 224 firms (= 16.5%), ended up switching to single-class structures in our data, and only 8 were due to these provisions, rendering the provisions almost ineffective.

In contrast, the first type, which conditions on simple passing of time since an IPO, is automatically triggered regardless of controlling shareholders' actions. As a result, while only 17 firms in the sample have the first type of provision with a triggering point earlier than the time of this writing, 12 of them switched to a single-class structure (9 of 12 are due to the sunset provision). This finding suggests that this type of sunset provision is effective in changing governance structure conditional on firm maturity.[32]

To shed light on how these sunset provisions may affect firm valuation, we explore the ex post effect of share unifications due to sunset provisions on Tobin's *q*. Our approach here is simple in that we compare firms that unify their share classes with average dual-class firms with similar maturity and other firm characteristics in the same industry and year. Specifically, we estimate a version of Equation (4) in which the interaction term between an indicator for unifications and an indicator for ages greater than or equal to five (the median firm age at share unifications in the sample) is employed, as well as their standalone terms. We use a sample consisting of firms that unify multiple classes (as an event group) as well as all other dual-class firms (as a control group).

Table 10 shows the estimation results. Column (1) shows that dual-class firms in this sample experience a 0.55 drop in Tobin's *q* when they become older than or equal to five years (*t*-stat = -3.86). However, the positive coefficient on *Unification* × *d[Age ≥ 5]* (0.554; significant at the 10% level) indicates that dual-class firms unifying shares (whether due to sunset provisions or not) mitigate this decline. Importantly, Column (2) shows that for a subset of unifications due to sunset provisions, the coefficient on *Unification* × *d[Age ≥ 5]* is greater (0.929) and significant at the 5% level. Thus, while suggestive, estimates in Table 10 illustrate that switching to single-class voting when firms are relatively mature can significantly increase valuation ex post, particularly

[31] The different types of sunset provisions are not mutually exclusive for a given firm.
[32] Examples of firms that switch to single-class voting due to the sunset provision include Texas Roadhouse (2009) and MaxLinear (2017). The other five were acquired or otherwise delisted before the subset provision took effect.

when the switches are due to sunset provisions. To the extent that selection is controlled for by comparing firms that have the same governance structure (i.e., dual-class) ex ante with one group switching to a single-class structure as they mature and the other group maintaining the initial structure, these results support a causal effect of having a dual-class structure on mature firms.

[Insert Table 10 here]

Based on findings in this section, combined with our main findings on dynamics of the economic effects of the dual-class structure, we suggest the following policy implications. First, securities regulators and exchanges may want to allow dual-class shares with certain requirements for sunset provisions, instead of banning them altogether, as it was the case for the NYSE before 1984 and in the Hong Kong Exchange until recently. Second, any regulations on dual-class shares and sunset provisions should be specific so that the provisions will be triggered when the net benefits of concentrated control are likely to disappear. As shown above, the common provisions that are conditional on ownership shares of the insider group appear to be ineffective in achieving optimal timing of switching because of natural agency conflicts.

Third, one particularly effective sunset provision could involve eliminating the structure at a predetermined point in time after an IPO, which is currently employed by only a minority of dual-class IPOs. An important advantage of this provision is that the timing is verifiable and thus contractible ex ante. Further, their simplicity makes it easier to implement in practice. One potential issue with this type of provision, however, is that agency costs related to a dual-class structure may increase sharply as a firm approaches a predetermined time of sunset. Or, dual-class voting might turn out to be (still) optimal even at a predetermined time. One could mitigate these issues by giving minority shareholders an optional vote that determines an extension of the dual-class structure, instead of a definite sunset. For example, every seven years, minority shareholders vote on whether to maintain a dual-class structure. Future research can examine the incentive effects of the periodic right to eliminate a dual-class structure relative to a sunset at a fixed time, and the net effect of these alternative schemes on shareholder value.[33] Of course, these provisions may be costly, discouraging some private firms from listing on stock markets ex ante. Thus, any policies regarding dual-class voting and sunset provisions should take into account their effect on firms' incentives to list as well as their ability to protect firms from capital market pressures.

[33] For a legal discussion of the benefits of sunset provisions that condition on a fixed period, see, e.g., Bebchuk and Kastiel (2017).

6. Conclusions

This paper provides comprehensive evidence that firm maturity is an important determinant of the benefits and costs of adopting a dual-class share structure. Our results suggest that for young firms, a dual-class structure is not negatively associated with firm performance (e.g., operating performance, innovation, agility and risk) or valuation. In fact, for many young firms, dual-class voting may be preferred. However, this is not the case for mature firms. Relative to single-class firms, dual-class firms experience a 10% larger decline in valuation as they mature. Dual-class firms' operating performance and pace of innovation deteriorate more than single-class firms as they mature. Further, as dual-class firms mature, the voting premium increases, and announcement returns for dividends increase compared with single-class firms with similar maturity, which implies increasing agency costs with maturity. In addition, we find evidence that higher systematic risk is a channel via which mature dual-class firms lose valuation relative to mature single-class firms. Taken together, the evidence in this paper points toward declining net benefits of a dual-class structure over firm maturity.

Our finding that a dual-class structure is more costly for mature firms supports the arguments for sunset provisions that automatically trigger elimination of the structures when firms mature. Despite potential benefits of switching to a single-class structure to (external) shareholders, we present evidence that the vast majority of firms do not have effective subset provisions. That is, they either have weak forms of provisions that are unlikely to be triggered conditional on firm maturity or do not have sunset provisions at all. Thus, requirements for specific sunset provisions conditional on passage of time since an IPO or giving minority shareholders a periodic vote that determines an extension of the dual-class structure may be called for. These provisions are also easy to implement and monitor.

More broadly, the dual-class structure can replicate other forms of deviations from proportional voting, such as pyramids and cross-ownerships (Bebchuk, Kraakman, and Triantis 2000). Therefore, our results regarding the dynamics of net benefits of dual-class voting should also have implications for dynamic effects of a broader array of corporate control mechanisms over maturity, some of which are widely used outside the US (e.g., Claessens, Djankov, and Lang 2000; Faccio and Lang 2002; Becht, Kamisarenka, Pajuste 2018).

References

Abel, A. B., and J. C. Eberly. 1994. A unified model of investment under uncertainty. *American Economic Review* 84:1369–84.

Achyuta, A., A. V. Chari, and S. Sharma. 2013. Firing costs and flexibility: Evidence from firms' employment responses to shocks in India. *Review of Economics and Statistics* 95:725–40.

Adams, R., and D. Ferreira. 2008. One share–one vote: The empirical evidence. *Review of Finance* 12:51–91.

Amihud, Y. 2002. Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets* 5:31–56.

Bebchuk, L. A., and K. Kastiel. 2017. The untenable case for perpetual dual-class stock. *Virginia Law Review* 103:585–631.

Bebchuk, L., R. Kraakman, and G. Triantis. 2000. Stock pyramids, cross-ownership, and the dual class equity: The mechanisms and agency costs of separating control from cash-flow rights. In R. K. Morck, ed., Concentrated corporate ownership, 295–315. Chicago: University of Chicago Press.

Becht, M., Y. Kamisarenka, and A. Pajuste. 2018. Loyalty shares with tenure voting - A Coasian bargain? Evidence from the Loi Florange experiment, ECGI working paper no. 398/2018.

Bertrand, M., and S. Mullainathan. 2003. Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy* 111:1043–75.

Bloom, N., 2009. The impact of uncertainty shocks. *Econometrica* 77:623–85.

Burkart, M., and S. Lee. 2008. One share–one vote: The theory. *Review of Finance* 12:1–49.

Brav, A., W. Jiang, and H. Kim. 2009. Hedge fund activism: A review. *Foundations and Trends in Finance* 4:185–246.

Brav, A., W. Jiang, and H. Kim. 2015. The real effects of hedge fund activism: Productivity, asset allocation, and labor outcomes. *Review of Financial Studies* 28:2723–69.

Brav, A., W. Jiang, S. Ma, and X. Tian. 2018. How does hedge fund activism reshape corporate innovation? *Journal of Financial Economics* 130:237–64.

Carhart, M. M. 1997. On persistence of mutual fund performance. *Journal of Finance* 52:57–82.

Claessens, S., S. Djankov, and L. H. P. Lang. 2000. The separation of ownership and control in East Asian corporations. *Journal of Financial Economics* 58:81–112.

Claessens, S., S. Djankov, J. P. H. Fan, and L. H. P. Lang. 2002. Disentangling the incentive and entrenchment effects of large shareholdings. *Journal of Finance* 57:2741–71.

Cooper, I. 2006. Asset pricing implications of nonconvex adjustment costs and irreversibility of investment. *Journal of Finance* 61:139–70.

Cremers, M., B. Lauterbach, and A. Pajuste. 2018. The life-cycle of dual class firms. Unpublished working paper. University of Notre Dame, Bar-Ilan University, and Stockholm School of Economics in Riga.

Cronqvist, H., and M. Nilsson. 2003. Agency costs of controlling minority shareholders. *Journal of Financial and Quantitative Analysis* 38:695–719.

Davis, S. J., J. Haltiwanger, R. Jarmin, J. Lerner, and J. Miranda. 2011. Private equity and employment. NBER working paper no. 17399.

DeAngelo, H., L. DeAngelo, and R. M. Stulz. 2006. Dividend policy and the earned/contributed capital mix: A test of the life-cycle theory. *Journal of Financial Economics* 81:227–54.

DeMarzo, P. M., and M. J. Fishman. 2007. Optimal long-term financial contracting. *Review of Financial Studies* 20:2079–128.

Doidge, C. 2004. U.S. cross-listings and the private benefits of control: Evidence from dual-class firms. *Journal of Financial Economics* 72:519–53.

Easterbrook, F. H. 1984. Two agency-cost explanations of dividends. *American Economic Review* 74:650–59.

Faccio, M., and L. H. P. Lang. 2002. The ultimate ownership of western European companies. *Journal of Financial Economics* 65:365–95.

Fama, E. F., and K. R. French. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33:3–56.

Field, L., and M. Lowry. 2017. Contrasts in governance: Newly public firms versus mature firms. Unpublished working paper. University of Delaware and Drexel University.

Field, L., M. Lowry, and A. Mkrtchyan. 2013. Are busy boards detrimental? *Journal of Finance* 109:63–82.

Foley, C. F., and G. Greenwood. 2010. The evolution of corporate ownership after IPO: The impact of investor protection. *Review of Financial Studies* 23:1231–60.

Gompers, P. A., J. Ishii, and A. Metrick. 2010. Extreme governance: An analysis of dual-class firms in the United States. *Review of Financial Studies* 23:1051–88.

Grossman, S. J., and O. D. Hart. 1988. One share–one vote and the market for corporate control. *Journal of Financial Economics* 20:175–202.

Grullon, G., R. Michaely, and B. Swaminathan. 2002. Are dividend changes a sign of firm maturity? *Journal of Business* 75:387–424.

Hall, B. H., A. B. Jaffe, and M. Trajtenberg. 2001. The NBER patent citations data file: Lessons, insights, and methodological tools. NBER working paper no. 8498.

Harris, M., and A. Raviv. 1988. Corporate governance, voting rights, and majority rules. *Journal of Financial Economics* 20:203–35.

Heckman, J. J. 1979. Sample selection as a specification error. *Econometrica* 47:153–61.

Hubbard, R. G. 1998. Capital-market imperfections and investment. *Journal of Economic Literature* 36:1093–225.

Jarrell, G. A., and A. B. Poulsen. 1988. Dual-class recapitalizations as antitakeover mechanisms: The recent evidence. *Journal of Financial Economics* 20:129–52.

Jensen, M. C. 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76:323–29.

Johnson, W., J. Karpoff, and S. Yi. 2018. The lifecycle effects of firm takeover defenses. Unpublished working paper. Suffolk University, University of Washington, and Sogang University.

Kaplan, S. N., and L. Zingales. 1997. Do investment-cash flow sensitivities provide useful measures of financing constraints? *Quarterly Journal of Economics* 112:169–215.

Knoeber, C. R. 1986. Golden parachutes, shark repellents, and hostile tender offers. *American Economic Review* 76:155–67.

Kogan, L., D. Papanikolaou, A. Seru, and N. Stoffman. 2017. Technological innovation, resource allocation, and growth. *Quarterly Journal of Economics* 132:665–712.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny. 2000. Agency problems and dividend policies around the world. *Journal of Finance* 55:1–33.

Lease, R. C., J. J. McConnell, and W. H. Mikkelson. 1983. The market value of control in publicly-traded corporations. *Journal of Financial Economics* 11:439–71.

Lemmon, M. L., and K. V. Lins. 2003. Ownership structure, corporate governance, and firm value: Evidence from the East Asian financial crisis. *Journal of Finance* 58:1445–68.

Li, K., and N. R. Prabhala. 2007. Self-selection models in corporate finance. In E. Eckbo, ed., The handbook of corporate finance: Empirical corporate finance, 37–86. Amsterdam: North-Holland.

Loughran, T., and Ritter. 2004. Why has IPO underpricing changed over time? *Financial Management* 33:5–37.

Lowry, M., R. Michaely, and E. Volkova. 2017. Initial public offerings: A synthesis of the literature and directions for future research. *Foundations and Trends in Finance* 11:3–4, 154–320.

Masulis, R. W., C. Wang, and F. Xie. 2009. Agency problems at dual-class companies. *Journal of Finance* 64:1697–1727.

Michaely, R., R. H. Thaler, and K. L. Womack. 1995. Price reactions to dividend initiations and omissions: Overreaction or drift? *Journal of Finance* 75:573–608.

Morck, R. K., D. A. Stangeland, and B. Yeung. 1998. Inherited wealth, corporate control and economic growth: The Canadian disease. NBER working paper no. 6814.

Nenova, T. 2003. The value of corporate voting rights and control: A cross-country analysis. *Journal of Financial Economics* 68:325–51.

Partch, M. 1987. The creation of a class of limited voting common stock and shareholders' wealth. *Journal of Financial Economics* 18:313–39.

Peters, R. H., and L. A. Taylor. 2017. Intangible capital and the investment-*q* relation. *Journal of Financial Economics* 123:251–72.

Rydqvist, K. 1993. Dual-class shares: A review. *Oxford Review of Economic Policy* 8:45–57.

Shleifer, A., and L. Summers. 1988. Breach of trust in hostile takeovers. In A. Auerbach, ed., Corporate takeovers: Causes and consequences, 33–56. Chicago: University of Chicago Press.

Shleifer, A., and D. Wolfenzon. 2002. Investor protection and equity markets. *Journal of Financial Economics* 66:3–27.

Smart, S., and C. Zutter. 2003. Control as a motivation for underpricing: A comparison of dual- and single-class IPOs. *Journal of Financial Economics* 69:85–110.

Stein, J. C. 1988. Takeover threats and managerial myopia. *Journal of Political Economy* 96:61–80.

———. 1989. Efficient capital markets, inefficient firms: A model of myopic corporate behavior. *Quarterly Journal of Economics* 104:655–69.

Villalonga, B., and R. Amit. 2009. How are U.S. family firms controlled? *Review of Financial Studies* 22:3047–91.

Zhang, L. 2005. The value premium. *Journal of Finance* 60:67–103.

Zingales, L. 1995. What determines the value of corporate votes? *Quarterly Journal of Economics* 110:1047–73.

Appendix A: Conceptual Framework for Dynamic Effects of Dual-Class Voting

This appendix describes conceptual links between the effect of dual-class structures and firm maturity. A dual-class share structure trades off benefits and costs to outside shareholders (see, e.g., Rydqvist 1993; and Burkart and Lee 2008). On the one hand, firms can avoid costly takeover defenses and a myopic focus on short-term profits, thereby enabling them to maximize long-term value (e.g., Knoeber 1986; Shleifer and Summers 1988; Stein 1988, 1989). In addition, firms that adopt dual-class voting are less vulnerable to manager-shareholder agency conflicts, given that the owners of superior voting shares can easily intervene in management. On the other hand, under a dual-class structure, insiders can more easily extract private benefits of control at the expense of dispersed shareholders (e.g., Zingales 1995) or make bad managerial decisions with limited accountability. As a result, agency problems such as quiet life, empire building, and tunneling resources to insiders are likely to be more acute in dual-class firms. Also, control contests are largely absent, which is an important cost of dual-class share structures (Grossman and Hart 1988; Harris and Raviv 1988).

Importantly, protection from capital market pressure, a key feature of a dual-class structure, may be particularly beneficial when firms are young. First, investments often take a long time to recoup and are firm-specific for young firms. Second, it is more likely that outside investors are less knowledgeable about the quality of investments for young, high-growth firms than the original entrepreneur. For example, in its IPO documents filed in 2004, Google states, "This [dual-class] structure will also make it easier for our management team to follow the long term, innovative approach emphasized earlier." Similarly, in its announcement of the creation of new nonvoting shares in 2016, Facebook states, "Facebook's board of directors is proposing the creation of a new class of publicly listed, nonvoting Class C capital stock to ensure that the company maintains this long-term focus."

Further, young, fast-growing firms are often managed by founder(s) whose economic (e.g., wealth invested in equity) and noneconomic (e.g., reputation) payoffs largely depend on future firm value than current cash flows or private benefits of control. This back-loaded nature of the founder's payoff provides a strong incentive to mitigate agency conflicts (DeMarzo and Fishman 2007). Young firms also need more external financing and therefore have stronger incentives to restrain private benefits, thereby reducing the cost of capital (Easterbrook 1984).[34] In sum, the net benefits of dual-class structures will decline as firms mature, as growth options dwindle, and when the original entrepreneurs no longer manage the firm. All else being equal, we predict that the effects of adopting a dual-class structure on firm value and performance is more favorable for young, high-growth firms compared to mature firms. Further, the arguments above suggest that young firms adopting dual-class voting could have higher value than their single-class counterparts.

[34] To the extent that investors are rational in foreseeing potential agency costs, managers of dual-class firms with external financing needs would have strong incentives to reduce agency costs and thereby the cost of capital.

Appendix B: Definitions of Variables from CRSP and Compustat

This appendix provides definitions of firm-level financial variables from CRSP and Compustat.

- *Log assets* is the natural log of total book assets.
- *Age* is the number of years since an IPO (proxied by the first appearance in CRSP or Compustat with stock price or by Compustat IPO year, whichever is the earliest).
- *Tobin's q* is the ratio of the market value of capital to the book value of capital, where market value is market equity + book debt (proxy for market debt), and book value is book equity + deferred taxes + book debt.
- *Tobin's q (GIM)* is the ratio of the market value of assets to the book value of assets, where market value is book assets + market equity – book equity – deferred taxes.
- *Sales growth* is computed as the first difference of the natural log of sales.
- *ROA* is operating income before depreciation divided by lagged book assets.
- *Operating margin* is operating income before depreciation divided by sales.
- *Asset turnover* is sales divided by lagged book assets.
- *Labor productivity* is sales divided by lagged number of employees.
- *Market leverage* is total debt divided by the sum of total debt and market equity.
- *R&D* is research and development expenses divided by lagged book assets.
- *Tangibility* is net PP&E divided by book assets.
- *Payout ratio* is total payout, including dividends and repurchases divided by market equity.
- *Capex/Assets* is capital expenditure scaled by lagged book assets.
- *Employment growth* is computed as the first difference of the natural log of employment.
- *Cash flow* is net income plus depreciation and amortization divided by lagged assets.

Appendix C: Average Relation between Dual-Class Structure and Firm Performance and Valuation

This appendix describes baseline estimates for the average relation between a dual-class share structure and firm valuation and performance. We estimate the following regression:

$$y_{it} = \alpha_{jt} + \beta Dual_{it} + \gamma' X_{it} + \varepsilon_{it}, \qquad \text{(A-1)}$$

where y_{it} is either Tobin's q (a measure of firm valuation) or a measure of performance, including operating margin, asset turnover, and labor productivity, for firm i in year t; α_{jt} represents three-digit SIC industry (indexed by j) by year fixed effects; $Dual_{it}$ is an indicator variable equal to one if firm i has a dual-class share structure in year t; and X_{it} is a vector of control variables including log book assets, age (calculated from first appearances in CRSP or Compustat with stock prices or Compustat IPO dates, whichever is the earliest), market leverage, R&D expenses scaled by sales, asset tangibility, sales growth rates, ROA, and payout ratio. We exclude ROA from the set of controls when the dependent variable is a measure of operating performance. ε_{it} represents random errors clustered at the firm level.

Appendix Table A1 shows the results of estimating Equation (A-1). Coefficients on the control variables are generally consistent with findings reported in previous research (e.g., GIM 2010). Column (1) shows that the coefficient on *Dual* is positive yet insignificant. Relative to the average q of 2.10 for single-class firms, the estimate shown in Column (1) suggests that otherwise similar dual-class firms in the same industry and year have only 0.08 higher q (t-statistic = 1.32). This positive, insignificant association between dual-class status and firm valuation differs from previous research, which tends to find a negative association on average (e.g., GIM 2010) due to a difference in sample.

Next, Columns (2)–(4) of Appendix Table A1 examine the average association between the dual-class status and measures of operating performance. Although insignificant at a conventional level, the positive coefficient on *Dual* shown in Column (2) provides a hint that dual-class firms may exhibit higher profitability measured by operating margin. The negative coefficients on *Dual* shown in Columns (3) and (4) hint that dual-class firms may use capital and labor less efficiently than single-class firms as measured by asset turnover and labor productivity, although the coefficients are again insignificant. Overall, during the 1971–2015 period, dual-class firms exhibit statistically similar valuation and operating efficiency to single-class firms with similar characteristics.

Figure 1 – Fraction of dual-class IPOs among the universe of IPOs in technology sectors

This figure shows the fraction of dual-class IPOs relative to the universe of IPOs in the technology sectors as defined in Loughran and Ritter (2004), plus SIC codes 3559, 3576, and 7389, from 1980 through 2015. The sample contains all offerings of common shares from SDC Platinum with an offer price of at least $5.00, excluding REITs, ADRs, closed-end-funds, units (including the special purpose acquisition companies; SPACs), and companies not listed on CRSP within 7 days of the IPO.

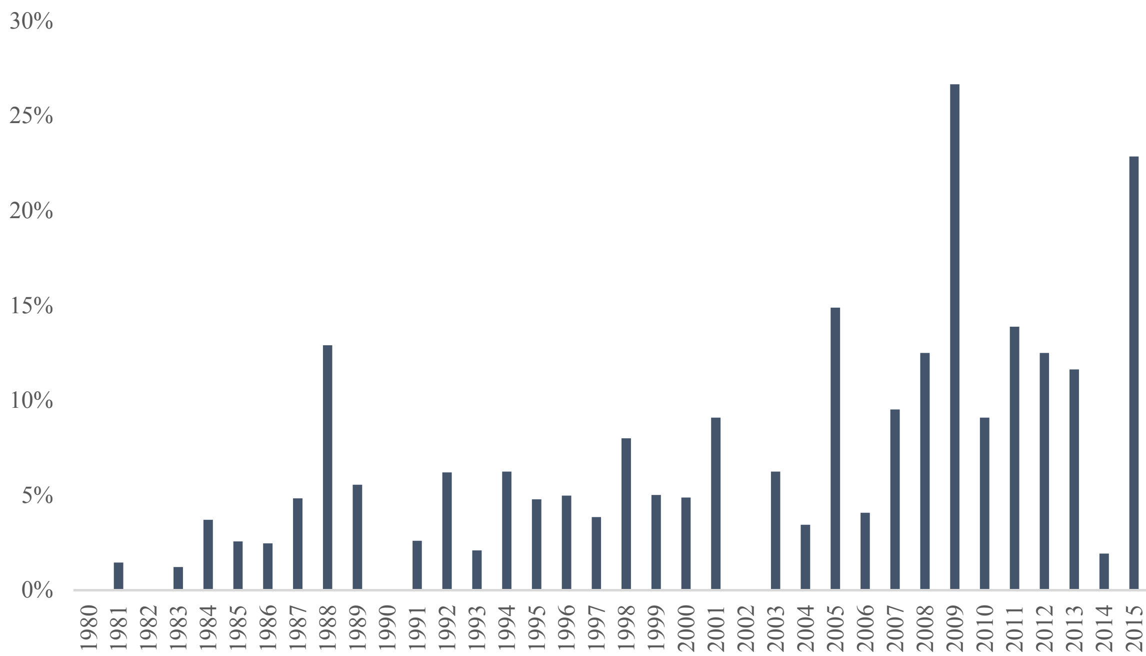

Figure 2 – Number and fraction of dual-class firms among Compustat universe

This figure shows the number (blue bar) and fraction of dual-class firms (red line) relative to Compustat firms from 1971 through 2015.

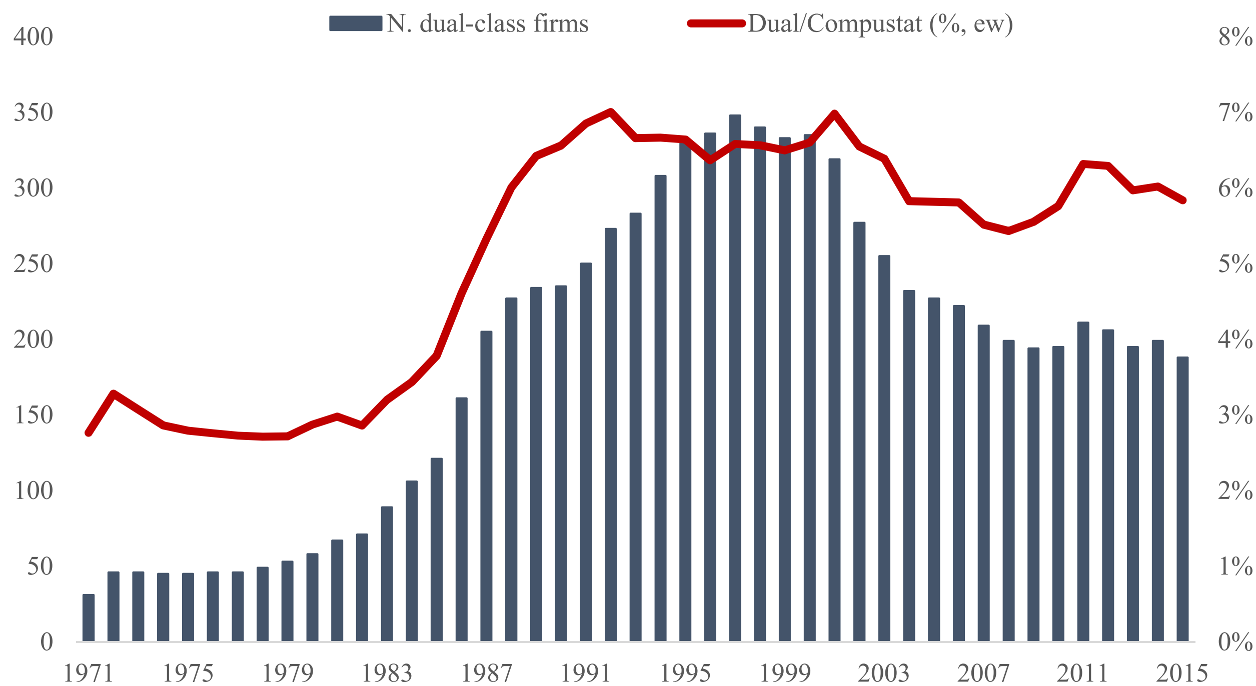

Figure 3 – Dynamics of Tobin's *q* for dual- and single-class firms over maturity

This figure plots the dynamics of Tobin's q for average dual- and single-class firms over their age from zero to 25. To construct the graph for each of the dual- and single-class groups, we first estimate a version of Equation (4) in which we replace *Mature*, *Dual*, and *Dual* × *Mature* with $\sum_{k=1}^{25} d[age\ =\ k]$ and $\sum_{k=0}^{25} Dual\ \times\ d[age\ =\ k]$, where *d[age = k]* is an indicator equal to one if firm age = k (0 ≤ k ≤ 25), and zero otherwise. We plot the constant plus the coefficient on *d[age = k]* for single-class firms (blue dashed line) and the constant plus the coefficient on *d[age = k]* plus the coefficient on *Dual* × *d[age = k]* for dual-class firms (red solid line).

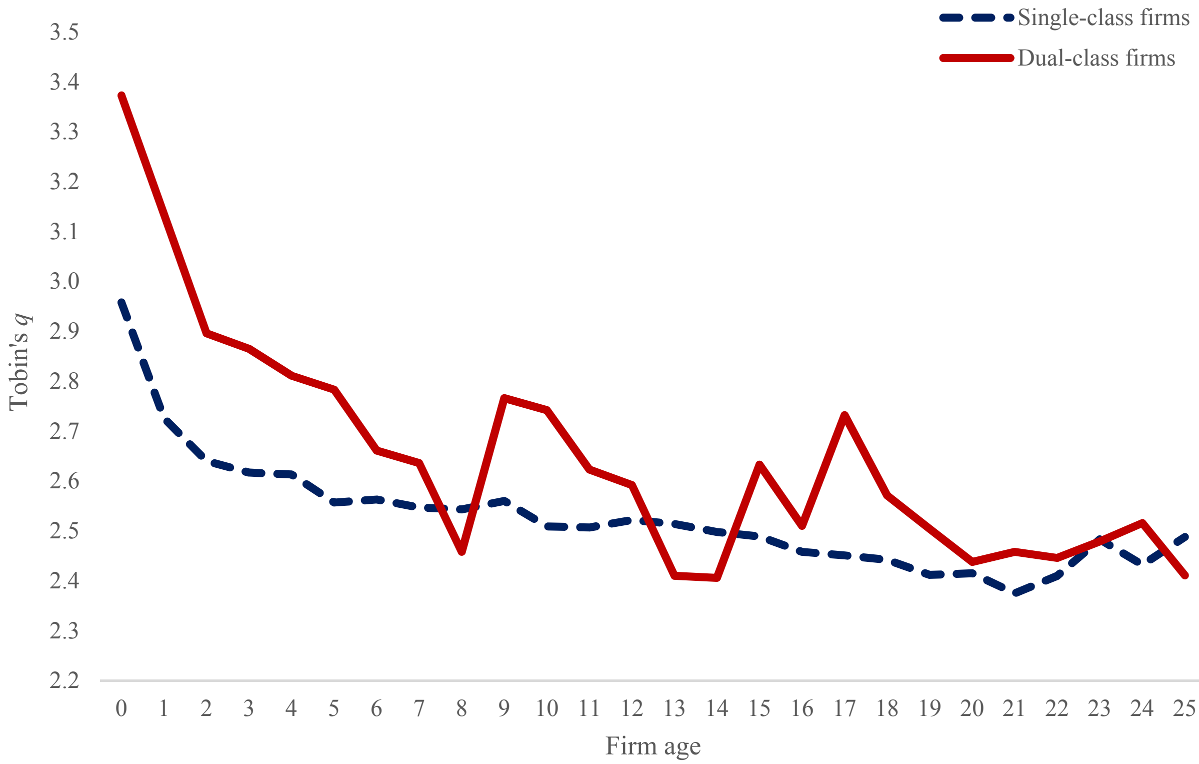

Table 1 – Descriptive statistics on dual-class and single-class firms

This table presents descriptive statistics on firm-level financial variables for dual- and single-class firms merged with Compustat from 1971 through 2015. "Total assets" is total book assets; "Log(assets)" is the natural log of total book assets; "Age" is the number of years since an IPO (proxied by the first appearance in CRSP or Compustat with stock price or by the Compustat IPO year, whichever is the earliest); "Tobin's *q*" is the ratio of the market value of capital to the book value of capital; "Sales growth" is the first difference of the natural log of sales; "ROA" is operating income before depreciation divided by lagged book assets; "Operating margin" is operating income before depreciation divided by sales; "Asset turnover" is sales divided by lagged book assets; "Log(Labor productivity)" is the natural log of sales divided by lagged number of employees; "Market leverage" is total debt divided by the sum of total debt and market equity; "Capex/Assets" is capital expenditures divided by lagged book assets; "R&D" is research and development expenses divided by lagged book assets; "Tangibility" is net PP&E divided by book assets; "Payout ratio" is total payout including dividends and repurchases divided by market equity; and "Employment growth" is the first difference of the natural log of employment. The column "Dual – Single" shows differences between the means for dual- and single-class firms. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	Single class		Dual class		Dual – Single
Variable	Mean	Std Dev	Mean	Std Dev	Diff.
Total assets	2446.1	12871.1	2698.3	14234.9	252.2
Log(assets)	5.273	2.054	6.026	1.768	0.753***
Age	14.522	14.690	15.867	14.265	1.345**
Tobin's *q*	2.101	2.149	2.074	2.245	-0.027
Sales growth	0.206	0.630	0.174	0.517	-0.033
ROA	0.113	0.202	0.136	0.145	0.022***
Operating margin	-0.043	0.981	0.090	0.513	0.133***
Asset turnover	1.378	1.032	1.343	0.982	-0.035
Log(Labor productivity)	-1.909	1.130	-1.826	0.961	0.083**
Market leverage	0.262	0.251	0.297	0.260	0.035***
Capex/Assets	0.087	0.110	0.075	0.094	-0.012***
R&D	0.040	0.084	0.022	0.058	-0.019***
Tangibility	0.313	0.238	0.299	0.211	-0.014
Payout ratio	0.025	0.042	0.026	0.041	0.002*
Employment growth	0.046	0.314	0.050	0.268	0.004
Observations	142,606	-	8,445	-	-

Table 2 – Voting premium over firm maturity

This table examines how the voting premium for dual-class firms changes with firm maturity (panel A) and growth (panel B) using a sample of dual-class firms for which information on stock price and trading volume is available from CRSP for both the inferior and superior classes of shares from 1971 through 2015. The voting premium is computed as $(P_A - P_B)/(P_B - rP_A)$, where P_A (P_B) is the price of the superior (inferior) voting shares and r is the relative number of votes of the inferior to superior voting shares. "Mature" is an indicator variable equal to one if the firm's age is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. "Sales growth" is the first difference of the natural log of sales. "Log market equity" is the natural log of market equity. "Prob (acquisition)" is the ratio of the number of acquisitions involving dual-class firms from SDC Platinum to the number of dual-class firms in our database by age group of five years. "Log volume (sup. / inf.)" is the natural log of the ratio of trading volumes between the superior and inferior classes of shares. Panel A does not use a specification that includes both firm and year fixed effects, given that the "Mature" indicator becomes nearly collinear with year fixed effects within firms. There is no such issue in Panel B, in which the key independent variable is sales growth. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Firm age

	(1)	(2)
Dependent Variable:	Voting premium (sup. to inf. class)	
Mature	3.790**	3.783**
	(2.25)	(2.09)
Log market equity	-0.969***	-0.871**
	(-3.15)	(-2.43)
Prob (acquisition)	0.051	0.098
	(0.35)	(0.69)
Log volume (sup. / inf.)	0.448	0.389
	(1.29)	(1.00)
Year fixed effects		Y
R^2	0.039	0.068
Observations	1337	1337

Panel B: Firm growth

	(1)	(2)	(3)
Dependent Variable:	Voting premium (sup. to inf. class)		
Sales growth	-2.247**	-2.470**	-2.151**
	(-2.32)	(-2.30)	(-2.03)
Log market equity	-0.819**	-0.759**	-2.452**
	(-2.51)	(-2.04)	(-2.56)
Prob (acquisition)	-0.004	0.033	-0.058
	(-0.03)	(0.24)	(-0.49)
Log volume (sup. / inf.)	0.434	0.392	0.389
	(1.26)	(1.00)	(0.95)
Year fixed effects		Y	Y
Firm fixed effects			Y
R^2	0.032	0.063	0.395
Observations	1333	1333	1333

Table 3 – Event study of dividend increases and initiations conditional on dual-class structure and firm maturity

This table examines the effects of firm maturity on the perceived value of dual-class firms' decisions to increase or initiate dividends, relative to single-class firms' decisions from 1971 through 2015. The dependent variable is the (scaled) cumulative abnormal return (CAR) from one day before to one day after dividend increase or initiation announcements. "Dual" is an indicator variable equal to one if a firm-year has multiple classes of shares with differing voting rights, and zero otherwise. "Mature" is an indicator variable equal to one if the firm's age is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. "ΔDiv" is the percentage change in dividends. Definitions of the other variables are the same as in Table 1. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Dependent variable:		CAR		CAR / ΔDiv
Sample:	Increases and initiations		Increases	
Dual	-2.260**	-2.257**	-3.415***	-9.367***
	(-2.21)	(-2.18)	(-2.82)	(-3.14)
Mature	0.182	0.300	0.170	0.602
	(0.81)	(1.23)	(0.64)	(0.83)
Dual × Mature	3.851***	3.778***	4.837***	12.248***
	(3.14)	(3.07)	(3.11)	(2.84)
Log assets	-	-0.106	-0.045	-0.017
	-	(-1.58)	(-0.57)	(-0.09)
Tobin's *q*	-	-0.042	0.008	-0.037
	-	(-0.54)	(0.09)	(-0.15)
ROA	-	0.557	0.616	2.677
	-	(0.45)	(0.44)	(0.73)
ΔDiv	-	-	0.262	-
	-	-	(1.04)	-
SIC3 × year fixed effects	Y	Y	Y	Y
R^2	0.565	0.566	0.629	0.628
Observations	5,509	5,509	4,469	4,469

Table 4 – Effects of dual-class recapitalizations and unifications conditional on maturity

This table examines the effects of dual-class share recapitalizations (Columns (1) and (2)) and unifications (Columns (3) and (4)) conditional on firm maturity. The dependent variable is the cumulative abnormal return (CAR) from three days before to three days after the announcement of a dual-class recapitalization and unification. "Mature" is an indicator variable equal to one if the firm's age since the IPO is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. Standard errors are adjusted for clustering at the year level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Dependent variable:	CAR			
Event:	Dual-class recapitalization		Dual-class unification	
Mature	-3.376*	-4.643*	3.261**	4.973**
	(-1.97)	(-2.03)	(2.20)	(2.52)
Constant	2.616*	3.466**	0.299	-0.613
	(1.86)	(2.26)	(0.19)	(-0.58)
Year fixed effects		Y		Y
R^2	0.035	0.178	0.046	0.355
Observations	88	88	62	62

Table 5 – Dual-class structure and Tobin's *q* conditional on firm maturity

This table examines the effects of adopting a dual-class share structure on firm valuation, measured by Tobin's *q*, conditional on firm age (panel A) and growth (panel B). Column (6) of panel A uses changes in Tobin's *q* as the dependent variable, and shows the second-stage regression results for the Heckman sample selection model. "Inverse Mills ratio" is the inverse Mills ratio from the first-stage of the Heckman selection model (see Appendix Table A3). "Dual" is an indicator variable equal to one if a firm-year has multiple classes of shares with differing voting rights, and zero otherwise. "Mature" is an indicator variable equal to one if the firm's age since the IPO is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. Definitions of the other variables are the same as in Table 1. Standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Firm age

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Tobin's *q*			ΔTobin's *q*
Sample:	Full	Matched	Full	Constant	IPO matched	Heckman selection
Dual	0.200***	0.219*	-	-	0.080	-0.431**
	(2.61)	(1.88)	-	-	(0.63)	(-2.27)
Mature	-0.131***	-0.123	-0.110***	-0.067*	-0.233	-
	(-6.31)	(-1.25)	(-4.35)	(-1.65)	(-1.20)	-
Dual × Mature	-0.216**	-0.283*	-0.182*	-0.258*	-0.421*	-
	(-2.51)	(-1.92)	(-1.83)	(-1.74)	(-1.79)	-
Log assets	-0.008	0.012	-0.019***	-0.252***	-0.040	-0.235***
	(-1.21)	(0.42)	(-2.61)	(-7.79)	(-0.92)	(-3.17)
Market leverage	-1.862***	-2.488***	-1.850***	-0.863***	-2.205***	2.251***
	(-39.83)	(-11.59)	(-39.77)	(-8.32)	(-9.10)	(6.01)
R&D	6.521***	7.592***	6.483***	5.706***	7.258***	-3.052***
	(28.26)	(6.81)	(27.98)	(6.23)	(6.29)	(-2.58)
Tangibility	-0.288***	0.605	-0.281***	-0.501***	0.202	0.059
	(-4.32)	(1.18)	(-4.22)	(-3.53)	(0.57)	(0.44)
Sales growth	0.189***	0.184**	0.186***	-0.050	0.013	0.028
	(12.96)	(2.05)	(12.72)	(-1.13)	(0.21)	(0.23)
ROA	0.572***	1.927***	0.606***	2.751***	1.446***	-1.855***
	(6.08)	(4.43)	(6.39)	(8.54)	(2.82)	(-3.42)
Payout ratio	-2.400***	-1.775*	-2.437***	-2.179***	-1.954**	10.972***
	(-16.06)	(-1.67)	(-16.27)	(-11.42)	(-2.39)	(6.16)
Inverse Mills ratio	-	-	-	-	-	-1.908***
	-	-	-	-	-	(-3.00)
SIC3 × year fixed effects	Y	Y	Y	Y	Y	
Firm fixed effects				Y		
Dual × IPO cohorts fixed effects			Y			
Year fixed effects						Y
R^2	0.304	0.379	0.305	0.634	0.460	0.071
Observations	151,051	12,558	151,051	44,196	3,705	24526

Panel B: Firm growth

	(1)	(2)
Dependent variable:	Tobin's *q*	
Dual	0.061	-
	(0.97)	-
Sales growth	0.195***	-0.065
	(13.26)	(-1.49)
Dual × Sales growth	0.138*	0.574**
	(1.71)	(2.04)
Firm-level controls	Y	Y
SIC3 × year fixed effects	Y	Y
Firm fixed effects	-	Y
R^2	0.303	0.634
Observations	151,051	44,196

Table 6 – Dual-class structure and operating performance conditional on firm maturity

This table examines the effects of adopting a dual-class share structure on operating margin, asset turnover, and labor productivity relative to adopting a single-class share structure, conditional on firm maturity. "Dual" is an indicator variable that equals to one if a firm-year has at least two classes of shares with differing voting rights, and zero otherwise. "Mature" is an indicator variable equal to one if the firm's age is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. Definitions of the other variables are the same as in Table 1. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
Dependent variable:	Operating margin	Asset turnover	Log labor productivity
Dual	0.039**	-0.035	0.041
	(1.96)	(-1.28)	(1.49)
Mature	0.050***	0.078***	-0.030***
	(5.44)	(7.69)	(-2.87)
Dual × Mature	-0.042*	0.018	-0.102**
	(-1.80)	(0.49)	(-2.51)
Log assets	0.077***	-0.049***	0.100***
	(23.94)	(-14.54)	(27.57)
Market leverage	-0.114***	-0.266***	-0.090***
	(-8.17)	(-12.05)	(-3.95)
R&D	-3.788***	-0.417***	-0.706***
	(-24.28)	(-4.74)	(-7.05)
Tangibility	0.278***	-0.410***	-0.435***
	(8.09)	(-10.46)	(-10.15)
Sales growth	0.080***	0.460***	0.499***
	(7.77)	(52.14)	(63.61)
Payout ratio	0.293***	-0.077	0.368***
	(5.47)	(-0.93)	(4.42)
SIC3 × year fixed effects	Y	Y	Y
R^2	0.272	0.525	0.553
Observations	139,788	139,788	139,788

Table 7 – Dual-class structure, firm maturity, and innovative output

This table examines the effects of dual-class structures and firm maturity on corporate innovative output. "Log(patents)" is the natural log of (one plus) the number of patents applied for; "Log(citations/patent)" is the natural log of (one plus) the number of citations per patent; "Top" is the percentage of patents whose citation is in the top tercile in a given patent class and year. "Dual" is an indicator variable that equals to one if a firm-year has at least two classes of shares with differing voting rights, and zero otherwise. "Mature" is an indicator variable equal to one if the firm's age is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. Definitions of the other variables are the same as in Table 1. The analysis includes firms that have filed for at least one patent during the entire sample period from a data set constructed by Kogan et al. (2017). All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Log(patents, t+1)	Log(patents, t+2)	Log(citations /patent, t+1)	Log(citations /patent, t+2)	Top (t+1)	Top (t+2)
Dual	-0.028	-0.044	0.002	-0.037	0.000	-0.004
	(-0.34)	(-0.53)	(0.02)	(-0.37)	(0.02)	(-0.20)
Mature	0.115***	0.113***	-0.058**	-0.039	-0.027***	-0.022***
	(4.39)	(4.16)	(-2.14)	(-1.42)	(-5.30)	(-4.07)
Dual × Mature	-0.315**	-0.317**	-0.265**	-0.234*	-0.044*	-0.046*
	(-2.49)	(-2.45)	(-2.01)	(-1.73)	(-1.85)	(-1.88)
Log assets	0.489***	0.492***	0.304***	0.302***	0.045***	0.045***
	(30.88)	(30.12)	(33.94)	(32.61)	(28.33)	(27.01)
Market leverage	-0.770***	-0.805***	-0.833***	-0.861***	-0.137***	-0.141***
	(-11.63)	(-11.72)	(-13.56)	(-13.50)	(-11.94)	(-11.97)
R&D	2.728***	2.766***	3.168***	3.116***	0.494***	0.483***
	(16.83)	(15.94)	(17.80)	(16.78)	(13.41)	(12.82)
Tangibility	0.237**	0.231**	0.197**	0.210**	0.020	0.015
	(2.14)	(2.02)	(1.99)	(2.05)	(1.05)	(0.77)
Sales growth	-0.082***	-0.082***	-0.028*	-0.047***	-0.001	-0.005
	(-7.43)	(-6.97)	(-1.86)	(-3.07)	(-0.27)	(-1.31)
ROA	-0.101*	-0.048	-0.052	-0.024	-0.015	-0.019
	(-1.68)	(-0.76)	(-0.80)	(-0.36)	(-1.10)	(-1.35)
Payout ratio	-0.067	-0.404	0.165	-0.165	0.033	-0.011
	(-0.28)	(-1.59)	(0.74)	(-0.70)	(0.71)	(-0.24)
SIC3 × year fixed effects	Y	Y	Y	Y	Y	Y
R^2	0.528	0.528	0.322	0.324	0.223	0.224
Observations	57,959	54,429	57,959	54,429	57,959	54,429

Table 8 – Investment and employment-*q* sensitivities for dual- and single-class firms over maturity

This table examines the effects of dual-class structures and firm maturity on sensitivities of corporate investment and employment decisions to investment opportunities. Panel A (panel B) uses a subsample with sales growth rate below the 25th (5th) percentile of the distribution. Columns (1) and (2) (Columns (3) and (4)) use capital expenditure scaled by lagged assets (employment growth rates) as the dependent variable. "Dual" is an indicator variable that equals to one if a firm-year has at least two classes of shares with differing voting rights, and zero otherwise. "Mature" is an indicator variable equal to one if the firm's age is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. "Young" is an indicator variable defined as 1 – "Mature." "Cash flow" is net income plus depreciation and amortization divided by lagged assets. Definitions of the other variables are the same as in Table 1. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Sales growth in first quartile

	(1)	(2)	(3)	(4)
Dependent variable:	Capex/Assets		Employment growth	
Sales growth:	First quartile			
Maturity:	Young	Mature	Young	Mature
q	0.450***	0.503***	1.933***	1.404***
	(6.50)	(7.08)	(5.22)	(3.94)
q × Dual	0.221	-0.483***	0.976	-0.774
	(0.72)	(-2.69)	(0.43)	(-0.81)
Control for Cash flow	Y		Y	
Firm fixed effects	Y		Y	
Year fixed effects	Y		Y	
R^2	0.661		0.485	
Observations	38,700		35,457	
Differences and *t*-statistics:				
q × Dual × (Mature - Young)	-0.698*		-1.727	
	(-1.93)		(-0.71)	

Panel B: Sales growth in bottom 5%

	(1)	(2)	(3)	(4)
Dependent variable:	Capex/Assets		Employment growth	
Sales growth:	Bottom 5%			
Maturity:	Young	Mature	Young	Mature
q	0.475*	0.434	2.700*	2.503
	(1.83)	(1.29)	(1.74)	(1.28)
q × Dual	0.748	-2.204	7.757	-40.641***
	(0.78)	(-1.09)	(0.78)	(-4.06)
Control for Cash flow	Y		Y	
Firm fixed effects	Y		Y	
Year fixed effects	Y		Y	
R^2	0.839		0.825	
Observations	7,496		6,253	
Differences and *t*-statistics:				
q × Dual × (Mature - Young)	-2.952		-48.398***	
	(-1.32)		(-3.36)	

Table 9 – Four-factor regressions for dual-class and matched single-class firms over maturity

This table presents estimates of the asset-pricing factor loadings associated with the dual-class status conditional on firm maturity over the 1971 through 2015 period (540 months). It reports coefficient estimates and *t*-statistics from value- (panel A) and equal-weighted (panel B) calendar-time zero-cost portfolio regressions with the sample excluding financial, utility, unclassified industry firms. The portfolio longs stocks of dual-class firms and shorts stocks of matched single-class firms on Tobin's *q* in the same Fama-French 48 industry. The stocks are allocated to two age groups ("Young" and "Mature") using the median age of 12 for dual-class firms. "Alpha" is the estimate of the regression intercept. "MKT" is the estimate of the factor loading on the market excess return (the Fama-French RMRF). "SMB," "HML," and "UMD" are the estimates of the factor loadings on the Fama-French size and book-to-market factors, and the Carhart momentum factor, respectively. "R^2" is the R-squared from the regressions. "N" is the number of monthly observations.

Panel A: Value-weighted portfolio				**Panel B: Equal-weighted portfolio**			
	(1) Total	(2) Young	(3) Mature		(1) Total	(2) Young	(3) Mature
Alpha	-0.017	0.120	-0.131	Alpha	0.183	0.162	0.073
	(-0.19)	(0.66)	(-1.22)		(2.76)	(1.41)	(0.91)
MKT	-0.013	0.007	-0.016	MKT	0.002	0.004	-0.004
	(-0.62)	(0.17)	(-0.65)		(0.16)	(0.17)	(-0.24)
SMB	-0.224	-0.287	-0.177	SMB	0.159	0.074	0.201
	(-7.46)	(-4.85)	(-5.06)		(7.38)	(1.99)	(7.77)
HML	0.045	-0.096	0.112	HML	0.072	0.050	0.089
	(1.38)	(-1.48)	(2.92)		(3.05)	(1.22)	(7.77)
UMD	-0.012	0.026	-0.022	UMD	-0.060	-0.057	-0.039
	(-0.58)	(0.29)	(-0.92)		(-4.01)	(-2.21)	(-2.18)
R^2	0.119	0.044	0.086	R^2	0.134	0.021	0.121
N	540	540	540	N	540	540	540

Table 10 – Ex post effects of dual-class share unifications on firm valuation

This table examines the ex post effects of switching from dual-class to single-class share structures ("share unification") on firm valuation measured by Tobin's *q*. The sample in Column (1) (Column (2)) includes firms that have switched from dual- to single-class structures at some point in their history (due to sunset provisions), and other dual-class firm-years from the main sample. "Unification" is an indicator variable equal to one if a firm switches from dual- to single-class structure at some point in its history, and zero otherwise. "d[Age ≥ 5]" is an indicator variable equal to one if the firm's age is larger than or equal to five years, which is the sample median age for share unifications, and zero otherwise. Definitions of the other variables are the same as in Table 1. Standard errors are adjusted for sample clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
Dependent variable:	Tobin's *q*	
Sample:	All switches	Due to sunset
Unification	-0.161	-0.219
	(-0.43)	(-0.23)
d[Age >= 5]	-0.551***	-0.555***
	(-3.86)	(-3.76)
Unification × d[Age >= 5]	0.554*	0.929**
	(1.66)	(2.11)
Log assets	0.013	0.021
	(0.27)	(0.39)
Market leverage	-2.292***	-2.227***
	(-7.41)	(-7.06)
R&D	8.932***	9.465***
	(4.37)	(4.40)
Tangibility	1.206*	1.246*
	(1.85)	(1.78)
Sales growth	0.261*	0.174
	(1.70)	(1.09)
ROA	3.436***	3.579***
	(4.66)	(4.67)
Payout ratio	0.139	0.529
	(0.10)	(0.35)
SIC3 × year fixed effects	Y	Y
R^2	0.508	0.516
Observations	7,262	6,904

Appendix Table A1 – Average relations between dual-class structure, firm valuation, and operating performance

This table examines the average relation between a dual-class share structure and Tobin's *q*, a measure of firm valuation, and measures of operating performance. "Dual" is an indicator variable equal to one if a firm-year has multiple classes of shares with differing voting rights, and zero otherwise. Definitions of the other variables are the same as in Table 1. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Dependent variable:	Tobin's *q*	Operating margin	Asset turnover	Log labor productivity
Dual	0.084	0.018	-0.022	-0.015
	(1.32)	(1.37)	(-0.97)	(-0.61)
Log assets	-0.010	0.080***	-0.050***	0.105***
	(-1.51)	(24.32)	(-14.26)	(27.84)
Age	-0.002**	0.000	0.002***	-0.002***
	(-2.51)	(0.30)	(5.32)	(-5.72)
Market leverage	-1.859***	-0.116***	-0.268***	-0.091***
	(-39.79)	(-8.32)	(-12.11)	(-3.98)
R&D	6.555***	-3.807***	-0.432***	-0.714***
	(28.41)	(-24.35)	(-4.89)	(-7.12)
Tangibility	-0.292***	0.277***	-0.407***	-0.440***
	(-4.36)	(8.06)	(-10.39)	(-10.26)
Sales growth	0.195***	0.076***	0.459***	0.497***
	(13.42)	(7.45)	(51.96)	(63.20)
ROA	0.570***	-	-	-
	(6.05)	-	-	-
Payout ratio	-2.449***	0.328***	-0.067	0.401***
	(-16.35)	(6.14)	(-0.81)	(4.80)
SIC3 × year fixed effects	Y	Y	Y	Y
R^2	0.303	0.271	0.524	0.554
Observations	151,051	139,788	139,788	139,788

Appendix Table A2 – Robustness of dynamic effects of dual-class structure conditional on firm maturity

This table examines robustness of the baseline effects of adopting a dual-class share structure on firm valuation, conditional on firm age. Column (1) uses GIM's (2010) definition of Tobin's *q* for the dependent variable; Column (2) uses firm ages based on founding years to define the indicator variable "Mature"; Column (3) uses firms that went public before 2003; Columns (4) and (5) use observed premiums for superior voting shares when superior shares are traded; when they are not traded, Column (4) uses a 10% premium over the price of traded, inferior voting shares, and Column (5) uses a premium for a matched (on industry, year, and firm size) dual-class firm; and Column (6) use Peters and Taylor's (2017) total *q* as the dependent variable. "Dual" is an indicator variable equal to one if a firm-year has multiple classes of shares with differing voting rights, and zero otherwise. "Mature" is an indicator variable equal to one if the firm's age is larger than or equal to its sample median for dual-class firms (12 years), and zero otherwise. Definitions of the other variables are the same as in Table 1. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	Tobin's q (GIM)	Tobin's q		Tobin's q (10% VP)	Tobin's q (matched VP)	Total q (Peters-Tylor)
Sample:	Full	Age based on founding year	IPO before 2003			
Dual	0.137***	0.273**	0.168**	0.169***	0.150***	0.104
	(2.86)	(1.99)	(2.01)	(3.00)	(2.66)	(1.42)
Mature	-0.124***	-0.286***	-0.111***	-0.131***	-0.131***	-0.461***
	(-9.77)	(-6.86)	(-5.16)	(-7.78)	(-7.78)	(-23.50)
Dual × Mature	-0.143***	-0.279*	-0.196**	-0.200***	-0.192***	-0.212***
	(-2.68)	(-1.94)	(-2.19)	(-2.84)	(-2.75)	(-2.64)
Log assets	0.004	0.019	-0.002	0.003	0.004	0.059***
	(0.94)	(1.31)	(-0.34)	(0.62)	(0.64)	(9.61)
Market leverage	-1.458***	-2.146***	-1.828***	-1.761***	-1.759***	-1.914***
	(-53.74)	(-29.05)	(-37.86)	(-47.81)	(-47.76)	(-43.59)
R&D	4.226***	6.904***	6.506***	5.313***	5.316***	1.680***
	(30.48)	(23.37)	(26.05)	(32.59)	(32.59)	(8.08)
Tangibility	-0.142***	-0.138	-0.298***	-0.280***	-0.282***	-1.568***
	(-3.43)	(-1.17)	(-4.31)	(-5.30)	(-5.33)	(-18.27)
Sales growth	0.139***	0.227***	0.188***	0.149***	0.148***	0.426***
	(15.81)	(9.44)	(12.15)	(14.48)	(14.46)	(25.44)
ROA	0.656***	0.974***	0.530***	0.768***	0.768***	0.908***
	(11.29)	(7.17)	(5.18)	(11.24)	(11.23)	(10.56)
Payout ratio	-1.838***	-2.610***	-2.469***	-2.233***	-2.234***	-3.328***
	(-20.09)	(-9.78)	(-16.07)	(-18.17)	(-18.18)	(-22.12)
SIC3 × year fixed effects	Y	Y	Y	Y	Y	Y
R^2	0.369	0.327	0.308	0.363	0.363	0.285
Observations	150990	58873	140864	150990	150990	150376

Appendix Table A3 – First-stage probit regression for Heckman selection model

This table presents the first-stage probit regression results for the Heckman sample selection model. The sample includes observations for firms that went public in 1990 or before in their ages between 12 and 25. The dependent variable is an indicator equal to one if a firm-year remains in the CRSP/Compustat database at age k, $12 \leq k \leq 25$, and zero otherwise. "Dual" is an indicator variable equal to one if a firm-year has multiple classes of shares with differing voting rights, and zero otherwise. "Log turnover rate" is the natural log of the average daily trading volume scaled by the number of shares outstanding, a measure of market liquidity. All independent variables, except for "Dual", are average values for a given firm across ages zero to 11. Definitions of the other variables are the same as in Table 1. All standard errors are adjusted for clustering at the firm level, and *t*-statistics are in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)
Dependent Variable:	1(remain)
Heckman step:	first step
Dual	0.409***
	(3.61)
Log assets	0.155***
	(12.67)
Market leverage	-0.752***
	(-9.59)
R&D	1.657***
	(6.20)
Tangibility	0.063
	(0.89)
Sales growth	-0.157***
	(-4.35)
ROA	0.691***
	(6.29)
Payout ratio	-2.631***
	(-4.61)
Log turnover rate	0.069***
	(3.66)
Year fixed effects	Y
Observations	81971

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI will produce and disseminate high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It will draw on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.global/content/working-papers) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Fin.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html