Sticking Around Too Long?

Dynamics of the Benefits of Dual-Class Voting*

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Abstract

Contrary to the common view that proportional voting rights are always optimal, 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 relative valuation declines, and they become less agile and efficient (in terms of operating margins, innovative output, and labor productivity) compared to their single-class counterparts. In addition, we show that voting premiums increase with firm age, suggesting that private benefits at dual-class firms increase over maturity. Our findings suggest that sunset provisions are a sensible solution to these increasing agency problems over maturity associated with dual-class voting. Using hand-collected data, we find that most dual-class firms adopt provisions that are unlikely to take effect. We propose that provisions conditional on firm age or giving inferior shareholders a periodic right to decide on whether to keep dual-class voting provide effective, time-consistent solutions.

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

JEL Codes: G14, G18, G30

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1. Introduction

Grossman and Hart (1988) and Harris and Raviv (1988) show that a simple proportional voting right of 'one share-one vote' is optimal. Consistent with theory, existing 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 value (see, e.g., Adams and Ferreira, 2008; Gompers, Ishii, and Metrick, 2010). Despite these apparent disadvantages, we observe a rising popularity of this structure. For example, Figure 1 shows that an increasing fraction of initial public offerings (IPOs) in the "high tech" sector, such as IPOs offered by Google, Facebook, and Alibaba, have adopted dual-class voting in recent years. More generally, this phenomenon is particularly 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 universally sub-optimal. In particular, we develop and test the prediction that net benefits of adopting a dual-class structure decline over a firm's lifecycle. Theories of voting rights and investor protection predict that the effects of a dual-class (relative 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 smaller for young, fast-growing firms in which the insider has significant incentives (economic and noneconomic) to maximize firm value. This is because their payoff depends much more on future firm value than consumption of private benefits today (DeMarzo and Fishman, 2007). Second, for young firms in which much of the unique knowledge and growth opportunities are likely tied to founder-managers (i.e., the incumbent), any benefits of control contests to firm value will 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 a dual-class share structure, is more important for young firms (Stein, 1988). Thus, it could be advantageous to create a structure in which young, growth 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 dynamics of costs and benefits of dual-class structure over firm maturity by constructing a dataset of dual-class firms in the United

States from 1971 to 2015. The dataset contains detailed information on voting rights of each class of shares for nearly 9,000 dual-class firm-years (900 unique dual-class firms), recapitalizations of single-class structures into dual-class, and vice versa, and voting premium for a subsample of firms for which both classes are publicly traded.

Using this dataset, we study the impact of dual class structure over the firms' life cycle using several empirical settings. We first show that the premium of the superior voting stock is 3.3 percentage points higher for "mature" than "young" dual-class firms, which is sizeable relative to the sample average voting premium of 4.3%.[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, and thus suggest that the overall value impact of dual-class structure may also decline over maturity. Second, 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. 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 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 a declining net benefit of dual-class voting over maturity. Third, we examine the market's reaction to the announcement of dual-class unifications, in which multiple stock classes with different voting rights are unified to become 'one share-one vote,' and again find evidence that a dual-class structure becomes less beneficial over firm age: When mature firms announce to unify multiple classes of shares, the CAR is significant at 4.4%, whereas there is no significant market reaction to mature firms making such an announcement.

Fourth, we analyze how the effect of dual-class voting on firm value, as measured by Tobin's *q*, 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 firm value relative to single-class firms, controlling for industry-by-year fixed effects and firm-level

[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–since their IPOs. The baseline result are robust to the choice of a cutoff to define mature firms, such as between 5 to 15 years since an IPO. Using a continuous variable for age yields similar results (see Figure 2). 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 2, column 2).

characteristics. Importantly, however, dual-class firms experience a 10% greater decline in Tobin's q as they mature relative to single-class firms. Further, using growth rates instead of firm age as a proxy for maturity, or measuring firm's age from the time of incorporation rather than the time of its IPO yields similar results.

To mitigate the concern that the results for Tobin's q are driven by different sample selection of dual- and single-class firms, we show that our results continue to hold in a variety of 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 at their IPOs in the same industry using Tobin's q and firm size, proxied by log book assets. Then, we follow these firms over maturity and analyze their valuation dynamics. We find that in this matched sample, in which both dual- and single-class firms have statistically equivalent Tobin's q at IPO by construction, 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 result that dual-class firms experience a greater decline in value over maturity is due to different valuation levels and growth potentials at IPO between dual- and single-class firms, a specific type of selection.

Importantly, controlling for different sample attrition rates (i.e., single-class firms tend to leave stock markets more often than dual-class firms) using the Heckman (1979) selection model suggests that our baseline regressions likely under-estimate the effect of dual-class voting on firm value. This is because firms with a higher propensity for attrition (e.g., single-class firms) have a worse prospect in q. In summary, examining (i) the dynamics of voting premium, (ii) the impact of recapitalizations from dual to single and vice versa, (iii) the relative valuation of dual-class stocks to similar single-class stocks, all lead to the same conclusion: Dual-class stocks are initially valued at least at par, or even at a premium, with single class; but that their relative valuation declines over time as firms mature and growth slows down.

We explore possible channels underlying the increasing private benefits of control and declining value impact of dual-class voting over firm maturity. We find that as firms mature, operating margins and labor productivity deteriorate significantly more for dual-class than single-class firms, controlling for time-varying industry shocks and firm characteristics. In addition, we show that the pace of innovation decreases more for mature dual-class firms than their single-class counterparts, indicating declining benefits of dual-class structures for maturing firms (i.e., allowing firms to invest in long term projects such as innovation).

Furthermore, we explore increasing systematic risk as an additional channel via which dual-class firms experience a greater decline in value 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 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 decreasing valuation, margins, labor productivity, and pace of innovation, and they become more reluctant to cut investment and employment in bad times, increasing risk. Voting premia also increase with maturity. Thus, the variety of tests we conduct point toward one conclusion that the costs of a dual-class structure increase significantly as firms mature while the benefits dissipate. These results suggest that when control contests are most beneficial (e.g., firms are mature, growth slows down), the dual-class structure may prevent investors from intervening.

Why might not dual-class firms 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 it 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 1994-2015 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 since an IPO or retirement of the founder(s), automatically triggers elimination of dual-class voting.

Using hand-collected data on dual-class firms' provisions, we find that a majority (66.2%) of dual-class firms have sunset provisions, but that a vast majority of them are ineffective as they condition on either the transfer of superior shares from insiders to a third party or a reduction in the collective ownership of an insider group below a threshold. As such, these types of sunset provisions are unlikely to solve the ex post agency problem involved with dual-class voting. We find, however, that a minority of dual-class firms (6.4%) have provisions conditioning on passage of time since their IPO. These provisions are effective because ex post, they are independent of controlling shareholders' private interest. 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. Our finding that dual-class structures are less costly (and even beneficial on net) for young firms supports the arguments for these sunset provisions, which would allow consolidated control by the incumbent while it is likely beneficial to outside shareholders, yet more dispersed control as the benefits decline.

Thus, we argue that firms and investors would be better off if regulators allow registration of dual-class shares that are accompanied by effective sunset provisions, relative to banning dual-class structures altogether (e.g., the Hong Kong Exchange until recently) or allowing them to register without such conditions (e.g., US exchanges). A simple form of a sunset provision is to set a time limit to the structure, as in the case of Yelp. A more complex, and perhaps better, could be to give the inferior class holders the right to decide on share unifications every, say, seven years as a time-consistent contact. This amounts to giving the minority shareholders the right to consider whether the dual class structure maximizes the firm's value, or switching to a single-class structure is more beneficial. We discuss these policy implications in detail 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. We are able to provide novel evidence on channels through which dual-class firms' value declines more than single-class firms over maturity: higher agency costs reflected in increased value of dividend and voting premium; declining profit margins, productivity and pace of innovation; and increased risk; as dual-class firms mature, relative to single-class firms. Further, we hand-collect detailed information on sunset provisions that dual-class firms adopt and whether switches to single-class shares are due to these provisions. Thus, we are able to draw policy implications for usage of dual-class shares along with sunset provisions and how they affect agency conflicts as firms mature. Finally, by using hand-collected data on complete history of dual-class firms, we show that market reactions to switchers between dual- and single-class structures are consistent with increasing private benefits as dual-class firms mature and the dynamics of valuation associated with differential voting. Overall, we go beyond studying the dynamics of q for dual-class firms, and show evidence for plausible channels, and propose a policy change based on actual usage of potentially effective provisions in the US.

The dual-class share structure is arguably a more effective form of takeover defenses than other forms such as staggered boards and poison pills, which makes it unique in terms of the power it gives controlling shareholders. Indeed, a comprehensive news search for all large IPOs during 2011-2015 reveals that the public is much more concerned with dual-class shares than other instruments that protect the incumbent's control.[2] However, these other forms of governance structures that are used to consolidate control, and their effects may vary between firms with different maturity. Foley and Greenwood (2010) and Field, Lowry, and Mkrtchyan (2013) compare boards of directors and investor protections for young and mature firms. Field and Lowry (2017) argue that in recent years IPO firms were more likely to have classified boards relative to mature firms because the net benefits of classified boards are greater for young firms. Similarly, Johnson, Karpoff, and Yi (2016) 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 that shows these deviations are negatively associated with firm value and performance on average.[3] 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 taking a dynamic approach to the governance structure. The common view that a dual-class structure is universally sub-optimal for outside shareholders may be misguided. Rather, our findings show that the net benefits of dual-class structures are

[2] Specifically, we conduct a comprehensive newspaper search of major outlets such 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 such as '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 do not find an article that mentions this fact or shows explicit concerns about staggered boards.

[3] 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). Another related body of literature examines announcement returns around firms' decisions to recapitalize into dual-class shares and shows mixed effects of these changes (e.g., Partch, 1987; Jarrell and Poulsen, 1988).

systematically related to firms' life cycle, and that having effective sunset provisions for dual-class shares could increase its benefits over firm life cycle.

2. Data and Measurement

2.1 Identifying Dual-Class Firms

We construct our data set of dual-class firms in the US for a sample period from 1971 to 2015. We hand collect information on dual-class firms for the 1971–1993 and 2003–2015 periods and obtain data from Andrew Metrick's website for the 1994–2002 period.[4] 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 first identify candidate dual-class firms by comparing a given firm's numbers 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 GIM)). We supplement this set with a data set of dual-class IPOs from Jay Ritter's website.[5] Second, we hand check whether firms in this candidate sample have multiple share classes by using two data sources. For 1994–2015, we use the annual report (Form 10-K) and proxy statement (DEF 14A) taken from the SEC EDGAR database for each firm-year, except 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 1971–1993, 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.

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

[5] 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 Loghran and Ritter (2004).

A notable fraction of firms with more than one class of common shares have the same number of votes across classes (e.g., one vote per share), raising the question of whether those firms actually have a dual-class share structure with disparate voting power. We therefore determine whether these firms have disproportional voting rights between classes by manually examining security filings from EDGAR and Moody's Manuals.[6] 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 last 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 firms restrict ownership of one class of common stocks to citizens of specific countries.[7] 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.[8] 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*, market leverage, research and development (R&D) expenses scaled by sales, asset

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[6] In particular, we examine SEC filings such as DEF 14A, 424Bx, S-1, 10-K, and 10-Q, as well as Moody's manuals.
[7] For example, Grupo Iusacell, S.A. de C.V. restricts its Class B common stock ownership to Mexican citizens only, while their Class A common stock does not have ownership restriction.
[8] An alternative is to treat these firms as de facto single-class firms, which gives a very similar result.

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., 2017). 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.[9] 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 multiple classes of shares ranged between 2.8% to 3.4% prior to the early-1980s, increased to 6.5% to 7.0% in the early 1990s, and since then has stayed between 5.4% and 7.0%. 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 take-over activities (e.g., Jarrell and Poulsen, 1988). We examine market reactions to dual-class recapitalizations in Section 3.2.

[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, 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 Effect of Dual-Class Structure on Firm Performance and Value

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 effect of a dual-class share structure on firm value and performance. Appendix C provides detailed explanations of our estimation approach and variables, and Appendix Table 1 shows the estimation results. In general, we find that the average association between the dual-class status and firm performance and value is mixed and insignificant. In particular, otherwise similar dual-class firms in the same industry and year

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

have only 0.08 higher q (t-stat = 1.32). This positive, insignificant association between dual-class status and firm value differs from previous research, which tend to find a negative association on average (e.g., GIM, 2010) due to a difference in sample.[10] However, this difference in Tobin's q between average 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 ROA, operating margin, and labor productivity, are of mixed signs and insignificant. Thus, during the 1971–2015 period, dual-class firms exhibit statistically similar firm value and profitability to single-class firms with similar characteristics. In the next section, we address a more nuanced issue of how firm value and performance evolve dynamically over dual- and single-class firms' life cycles.

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 non-pecuniary incentives to maximize firm value. This is because their payoffs depend much more on future firm value than consumption of private benefits today (as in dynamic agency models such as DeMarzo and Fishman, 2007). As firms mature and grow slower, however, their incentives will tilt toward extracting private benefits from maximizing long-term firm value.

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.[11] This analysis uses a subsample of dual-class firms in our database for which both the superior and inferior classes

[10] 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 rather similar to theirs (negative and insignificant coefficients on *Dual*).

[11] 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.

are publicly-traded. To minimize the influence of outliers, we require that a voting premium is less than 125%. The resulting subsample includes 1,343 dual-class firm-years (105 unique dual-class firms) from 1971 to 2015. The mean and standard deviation of voting premia are 4.29% and 13.02%, in line with estimates reported in previous research (e.g., Zingales, 1995). By conducting 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, of the dynamics of private benefits, a plausibly important factor in those firms' valuation. We estimate the following regression:

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

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 relative number of votes of the inferior to superior voting shares; α_t represents year fixed effects; $Maturity_{it}$ is either of an indicator equal to one if firm i in year t is older than or equal to 12 years or sales growth rates; X_{it} includes log market equity which serves as an inverse proxy for the probability of hostile takeover (Zingales, 1995) 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 of superior to inferior stocks, and year fixed effects.

[Insert Table 2 here]

Table 2, Panel A presents the estimation results for equation (1). Column 1 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 3.45-percentage-point higher voting premium (significant at the 5% level), which is sizeable given the average voting premium of 4.29%. Column 2 includes year fixed effects and shows an estimate similar to that shown in column 1 (3.26%). To our knowledge, this is the first evidence that the value of voting changes considerably over firm age. This finding suggests that 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 rather than age 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 (0.314) is associated with a 0.70 percentage-point increase (= -0.314 × -2.232) in voting premia. In column 3, we further include firm fixed effects and find a similar result, demonstrating that private benefits increase as growth slows down within firms. Taken together, the results indicate that the costs associated with dual-class shares increase with firm maturity

3.2 Market Reactions to Dual Class Recapitalizations and Unifications over Maturity

We now examine the dynamics of the costs and benefits of dual-class structure using samples of dual-class recapitalizations and unifications. We study the market's reaction to the announcement of dual-class (i) recapitalizations (in which a superior voting stock class is created) and (ii) unifications (in which multiple stock classes with different voting rights are unified into a single class). 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. Relative to the analysis that uses Tobin's *q* as a measure of firm value (see Section 3.3), a key advantage of these tests using market returns is that we side step measurement error in *q*, particularly those related to measuring the replacement cost of assets.

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 SEC EDGAR to identify whether they become dual-class firms either at or after IPO, and exclude dual-class IPOs 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 1971-1984 and 1976-1987 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.[12] We

[12] 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.

exclude events that are confounded by announcements of other major corporate events, such as 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 following market model:

$$\varepsilon_{it} = R_{it} - R_{mt} \quad (2)$$

from day -3 to day +3, 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). Given the imprecision of the event date as explained above, we compute cumulative abnormal returns (CARs) over the [-3, +3] window.[13] 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 particularly clustered between 1983 to 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) which 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) 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 is 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 3 here]

Columns 1 and 2 in Table 3 present the estimation results. Positive regression constants (2.61% and 3.47%, significant at the 5% to 10% level) indicate that the market perceives a positive effect of dual-class structures on young firms. This finding is in a stark contrast with insignificant announcement effects documented in previous research (e.g., Partch, 1987; Jarrell and Poulsen,

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

1988). However, the negative coefficients on *Mature* (-3.37% 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.

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 terminal year as dual-class firms in our database is due to share unifications using SEC filings, Moody's Manual, 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) which 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 3 present the estimation results. The positive coefficient on a *Mature* indicator in column 2 (4.97; *t*-stat = 2.52) shows that the market perceives a 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. Interestingly, the economic magnitudes of the value effect of dual-class structures on mature firms estimated using recapitalizations and unifications are similar (e.g., 4.64% and 4.97% in columns 2 and 4). Thus, the overall evidence in this section is consistent with dual-class voting becoming less beneficial over firm age.

3.3 Firm Maturity and Dynamics of Tobin's *q*

We now examine whether the effects of dual-class structure change dynamically as firms mature by estimating the following regression equation:

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

where y_{it} is either Tobin's q (a measure of firm value) or a measure of performance, including ROA, 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*; $Mature_{it}$ is 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) and zero otherwise;[14] and 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. 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. The coefficient of interest is β_3, which represents the effect of a dual-class structure on mature firms relative to young firms.

Column 1 in Table 4, Panel A presents the baseline result of estimating equation (4) with Tobin's *q* as the dependent variable 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 value 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.[15] 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 firm value as they become older than or equal to 12 years compared to single-class firms. Given that we include a *Dual* indicator which controls for fixed differences in Tobin's *q* between dual- and single-class firms, this finding shows that having a dual-class structure becomes 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 2, column 1).

[Insert Table 4 here]

Figure 3 shows visual evidence for 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* and *Dual* × *Mature* with $\sum_{k=0}^{25} d[age\ =\ k]$ 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* × $d[age = k]$, $0 \leq k \leq$

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

[15] We find that dual-class firms' assets grow at a slower pace than single-class firms' as they mature (unreported), suggesting that the faster decline in Tobin's *q* is not mechanically driven by faster growth in dual-class firm's assets.

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 3, 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 0.30, 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 equivalent between the matched dual- and single-class firms (unreported). Column 2 presents the estimation results using the matched sample, and tells 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 in value 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) while 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 the 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 would have observations with ages higher than or equal to 12 (unless they disappear from the sample). The estimates shown in Appendix Table 2, column 3 are virtually identical with our baseline estimates (column 1 in Panel A of Table 4). Third, as shown in column 4, 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.

3.3.1 Sample Selection Bias

An important concern for the results so far is that different sample selection between dual- and single-class firms could drive the "dynamic effect" of dual-class voting we find. 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. Given that this analysis relies on within-firm variation across different maturity, we require that firms maintain the same voting structure (i.e., either of single- or dual-class) for at least 25 years and they exist both before and after 12 years of age. These additional criteria produce a subsample of 44,196 firm-years.[16] 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 become older. 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 is sizeable, with an additional 0.258 drop in Tobin's *q* for dual-class firms older than or equal to 12 years, and comparable with estimates without firm fixed effects in previous columns (e.g., -0.216 and -0.283 in columns 1 and 2).

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

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 30. 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 (proxied by attrition from Compustat) more often than dual-class firms. For example, among firms that were in Compustat at age zero or one, 35% of dual-class firms remain in the sample at age 12 or 13, whereas only 25% of single-class firms remain. If the sample attrition rate is correlated with firm value or performance (e.g., poorly performing firms disappear more often due to, for example, acquisition and bankruptcy), then our estimates for changes in value using 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 sample attrition using the same set of covariates in equation (4) and a *Dual* indicator for a sample of firms with ages between 12 and 25. In the second step, we estimate the following variant of equation (4):

$$\Delta q_{it} = \alpha_t + \beta Dual_{i0} + \gamma' X_{i0} + \delta H(\lambda' X_{i0} + \mu' Z_{0t}) + \varepsilon_{it}, \quad (5)$$

where Δ_{it} is the change in Tobin's q from the average across ages zero to two to year t (where 12 ≤ t ≤ 25) for firm i; α_t represents year fixed effects; $Dual_{i0}$ is an indicator variable equal to one if firm i has a dual-class share structure in age zero to two; X_{i0} is a vector of covariates in equation (4) that are averaged average across years zero to two; Z_{i0} represents an instrumental variable (IV) that affects the propensity of attrition but has no direct relation to valuation, averaged average across ages zero to two; *H(.)* is the inverse Mills ratio (hazard function) for attrition. Motivated by a large 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 Amihud (2002) illiquidity measure (averaged average across ages zero to two) as the instrument.[17]

Column 6 in Table 4 shows the result of estimating equation (5). First, the coefficient on the inverse Mill's ratio is -8.657 and significant at the 5% level, indicating that firms with higher attrition propensities (e.g., single-class firms) have a worse prospect in changes in Tobin's *q*. Thus, magnitudes that do not adjust for this sample selection pattern (e.g., those in columns 1 through 5 in Table 4) likely under-estimate the true magnitude. Second, and consistent with this conjecture, the estimate for *Dual* (-1.562; *t*-stat = -2.19) is negative and larger in economic magnitude than those in previous columns.

3.3.2 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 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-standard-deviation 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

[17] Strictly speaking, an instrumental variable (Z_{0t}) in equation (5) is not a requirement to identify the Heckman selection model, as long as the error terms in the equation and selection equation are jointly normally distributed and thus the inverse Mill's ratio is non-linear. However, given that the inverse Mill's ratio could be approximately linear in parts of its domain in practice, we use the illiquidity measure as an IV to identify the selection model properly (see e.g., Li and Prabhala, 2007).

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 et al., 2000). Thus, the solution should be in the contract ex ante (see Section 5), regulations, or pressure from activist investors.[18]

3.4 The Dynamic Effects of Dual-Class Structure on Operating Performance

In this section, we start exploring channels underlying the increasing private benefits of control and declining value impact of 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 equation (4), which uses a measure of operating performance as the dependent variable. Column 1 of Table 5 shows significantly positive coefficient on *Dual* and the 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, which is often used as a measure of capital efficiency.

[Insert Table 5 here]

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.[19] First, 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 5 results imply that deteriorating operating margins and labor efficiency partly explain a declining value impact of dual-class structures and increasing voting premia over maturity.

3.5 Firm Maturity and the Benefits of Dual-Class Structure – Technological Innovation

[18] 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 government and activist investors. See, e.g., "Hyundai group to streamline ownership structure in reform push," Reuters, March 28, 2018.

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

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. Could this decline in performance be due also 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 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.[20] 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 both from the 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 with 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.[21] 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., 2017). Following the literature, we impute missing values of the number of patents and citations as zero. In addition, we follow Hall et al. (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.

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

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

Table 6 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 the pace of innovation declines more for dual-class firms relative to otherwise similar single-class firms, as they mature. The estimate in column 1 suggests that as firms mature, 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% to 10% level. In 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 become older. 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 6 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.

3.6 Increasing Agency Costs Associated with Dual-Class Voting—the Case of Dividends

As firms mature, they typically experience a decline in growth opportunities and an increase in agency costs (e.g., Jensen, 1986). This is partly because with maturity, the controlling shareholder's payoffs depend less on future firm value but more on consumption of private benefits today (e.g., DeMarzo and Fishman, 2007). Unlike single-class', dual-class firms' shareholders have fewer remedies for agency problems due to their unique voting structure. Indeed, Section 3.1 shows evidence that private benefits for controlling shareholders of dual-class firms increase with firm maturity. Another plausible measure of agency costs is the perceived value of dividends. 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 payout 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 market's reaction to announcing a dividend increase or initiation 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 (i) 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 (the first dividend payment reported on CRSP), (ii) the firm has been traded on one of the three US exchanges in the previous two years in the case of dividend initiation, and (iii) the announcing firm is not in the financial, utilities, or unclassified industries. Finally, requiring CARs as well as firm-level characteristics 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).

For this sample, we estimate excess daily stock returns using the market model in equation (2) from day -1 to day +1 (e.g., Michaely, Thaler, and Womack, 1995). We compute CARs during the [-1, +1] window around the announcement by compounding the daily excess returns.[22]

[Insert Table 7 here]

Table 7 shows the results of estimating equation (4) in which the dependent variable is the CAR for dividend increases and initiations. 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. The economic magnitude of the effect is sizeable relative to the average CAR of 1.37% for dividend increases and initiations. 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

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

dual-class structures relative to single-class ones, presumably due to the increasing (agency) costs of withholding cash to external shareholders (La Porta et al., 2000; Shleifer and Wolfenzon, 2002; Grullon et al., 2002; DeAngelo et al., 2006).

3.7. Are Mature Dual-Class Firms Riskier than Single-Class Firms?

The results in the previous sections suggest that dual-class firms experience a greater increase in agency costs over maturity, as reflected in voting premia and the perceived value of dividends, than single-class firms. In addition, increasing agency problems associated with dual-class voting may also manifest in firms' risk profiles. For example, managers of mature dual-class firms may be reluctant to cut their workforces or liquidate assets in response to negative shocks, if they enjoy private benefits in maintaining existing operations or simply a "quite life" (e.g., Morck et al., 1998; Bertrand and Mullainathan, 2003).

In a neo-classical 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 premia. We thus explore the links between mature dual-class firms' adjustment costs and systematic risk by examining (i) the sensitivity of investment and employment decisions to investment opportunities (Section 3.7.1) and (ii) asset-pricing factor loadings over maturity (Section 3.7.2). Ultimately, through these analyses, we aim to provide evidence that increasing cash-flow risk (partly) explains declining market value of firms over maturity associated with dual-class voting.

3.7.1 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 neo-classical 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.[23] 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:

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

[23] See e.g., Kaplan and Zingales (1997); and Hubbard (1998).

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 flows 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).[24] 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." 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%) (e.g., Achyuta, Chari, and Sharma, 2013).

[Insert Table 8 here]

Table 8, Panel A 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. Columns 1 and 2 show that the coefficient on $q \times Dual$ is significantly smaller (at the 10% level) for capital expenditure among mature firms than young firms. Similarly, columns 3 and 4 show that the coefficient on $q \times Dual$ is smaller (yet insignificantly) for employment growth among mature (vs. 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 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.

3.7.2 Systematic risk

[24] In practice, we estimate a version of equation (6) that interacts the *Dual* and *Mature* indicators with *q* and cash flows, as well as firm and year fixed effects.

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 would 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 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) on average. Importantly, columns 2 and 3 show that dual-class (relative to Tobin's *q*-matched single-class) firms have significantly positive HML factor loadings among relatively mature firms, but not among young firms (0.112 vs. -0.096 in Panel A; 0.089 vs. 0.050 in Panel B). 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 an increase in systematic risk (a 'discount-rate channel'), which partly explains the relative decline in market value of dual-class compared with single-class firms over maturity that we demonstrated above.

4. Discussion and Policy Implications

Results from the variety of tests above suggest that young dual-class firms are valued at par, or even higher than similar single-class firms, while maturing dual-class firms' value declines significantly more. We show comprehensive evidence 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 old versus young firms is corroborated by dynamics of voting premia, Tobin's *q* for dual- and single-class firms, as well as 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 will increase firm value ex ante. However, such promises are time inconsistent because controlling shareholders are unwilling to relinquish power, especially if private benefits are large, even when it is no longer optimal to outside shareholders. This private incentive for the 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 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 SEC EDGAR (e.g., S-1's, DEF 14A's). Based on these filings, we classify sunset provisions for dual-class structures into provisions that condition on (i) a fixed period of time since the IPO, (ii) transfer of ownership of superior shares from insiders to third parties, (iii) a decrease in the collective ownership of an insider group below a threshold level, and (iv) 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%).[25] Given that these two types of provisions require the insider group's intention to relinquish its control or death of the insiders at extreme, it

[25] The different types of sunset provisions are not mutually exclusive for a given firm.

is unlikely to be triggered in practice. Consistent with this conjecture, only a small fraction of firms with provisions (ii) and (iii), 37 out of 224 firms (= 16.5%), ended up switching to single-class structures in our data, and only 8 were due to these provisions, rendering these 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 out 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.[26]

To shed light on how these sunset provisions may affect firm value, 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 (3) 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 the standalone terms. We use a sample consisting of firms that unify multiple classes (as an event group) as well as all other dual-class firm-years (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 significantly positive coefficient on *Unification* × *d[Age ≥ 5]* (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 (0.93) 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 firm value ex post, particularly 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

[26] 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.

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 prior to 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 condition on ownership shares of the insider group appear to be ineffective in achieving optimal timing of switching due to natural agency conflicts.

Third, one particularly effective sunset provision could involve eliminating the structure at a pre-determined point in time after an IPO, which only a minority of dual-class firms currently employ at IPO. One potential issue with this type of provision is that agency costs related to a dual-class structure may increase sharply as a firm approaches a pre-determined time of sunset. Or, dual-class voting might turn out to be (still) optimal even some years after a pre-determined time. One can 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. Naturally, these provisions are not costless as they might discourage private firms from listing on stock markets ex ante. However, our findings suggest that on the whole, there are clear benefits. Future research can examine incentive effects of these votes relative to a sunset at a fixed point in time, and the net effect of these alternative schemes on shareholder value.[27]

5. 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

[27] Legal scholars and policy makers have recently argued that dual-class shares should be always combined with sunset provisions (e.g., Bebchuck and Kastiel, 2017; Jackson, 2018). Our analysis of sunset provisions adds to this general recommendation by suggesting specific types of provisions that are more likely to be effective.

firms, a dual-class structure may be preferred. However, this may not be the case for mature dual-class firms. Relative to single-class firms, we find that 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. We also find that, as dual-class firms mature, the voting premium increases, and announcement returns for dividend increases or initiations 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 another channel via which mature dual-class firms lose value 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 less costly for young firms supports the arguments for sunset provisions that automatically trigger elimination of structures when firms mature. Despite potential benefits of switching to a single-class structure to (external) shareholders, we find that a majority of firms either do not have any sunset provisions or have weak forms of provisions that are unlikely to be triggered conditional on firm maturity. Thus, requirements for specific sunset provisions that condition on passage of time since an IPO or giving minority shareholders an periodic vote that determines an extension of the dual-class structure may be called for.

More broadly, the dual-class structure can replicate other forms of deviations from proportional voting, such as pyramids and cross-ownerships (Bebchuk et al., 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 et al., 2000; Faccio and Lang, 2002).

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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, 1992; 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, 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 under a dual-class structure. Thus, 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, would 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 her 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).[28] In sum, net benefits of dual-class structures will decline as firms mature, growth options dwindle, and when the original entrepreneurs no longer manage the firm. All else equal, we predict that the effects of adopting a dual-class structure on firm value and performance would be 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.

[28] 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/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 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.

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

This appendix describes baseline estimates for the average effect of a dual-class share structure on firm value and performance. We estimate the following regression:

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

where y_{it} is either Tobin's q (a measure of firm value) or a measure of performance, including ROA, 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 1 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). 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 value differs from previous research, which tend to find a negative association on average (e.g., GIM, 2010) due to a difference in sample.

Next, columns 2 through 5 of Table 2 examine the average association between the dual-class status and measures of operating performance. Although insignificant at a conventional level, the positive coefficients on *Dual* shown in columns 2 and 3 provide a hint that dual-class firms may exhibit higher profitability measured by ROA and operating margin. The negative coefficients on *Dual* shown in columns 4 and 5 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 firm value and profitability to single-class firms with similar characteristics.

Figure 1 – Fraction of Dual-Class IPOs among Universe IPOs in Technology Sectors

This figure shows the fraction of dual-class IPOs relative to the universe of IPOs from 1980 through 2015.

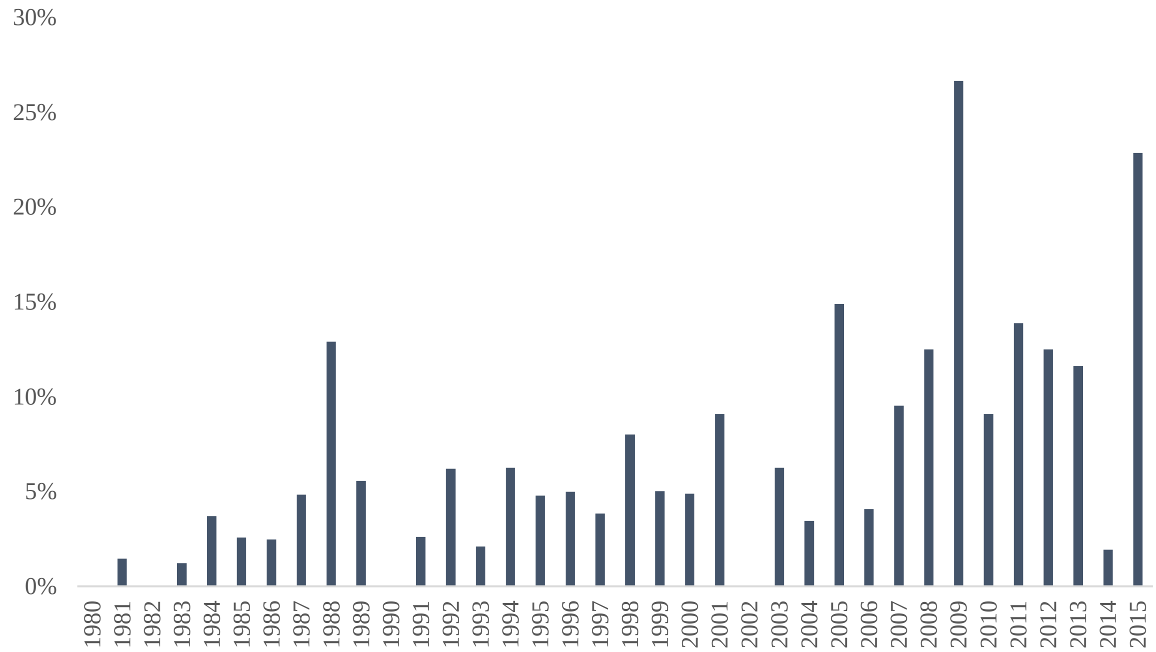

Figure 2 – Number and Fraction of Dual-Class Firms among Compustat Universe

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

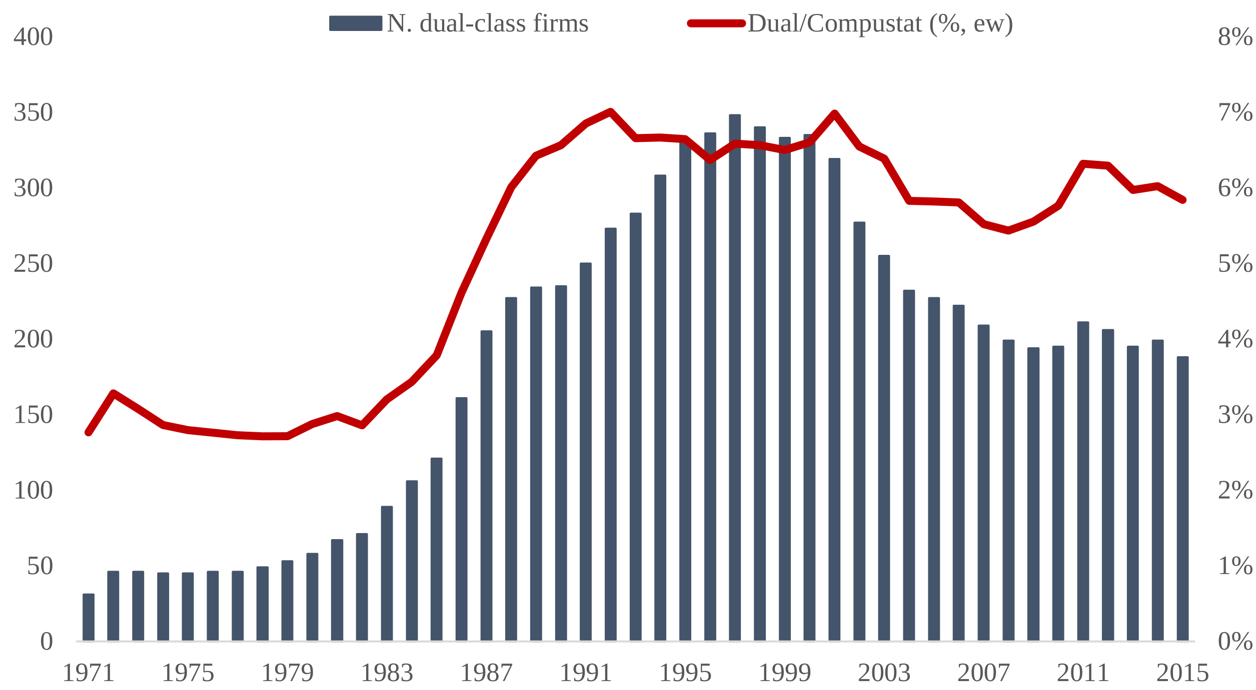

Figure 3 – Dynamics of Tobin's *q* for Dual- and Single-Class Firms over Maturity

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 (2) in which we replace *Mature* and *Dual* × *Mature* with $\sum_{k=0}^{25} d[age\ =\ k]$ 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).

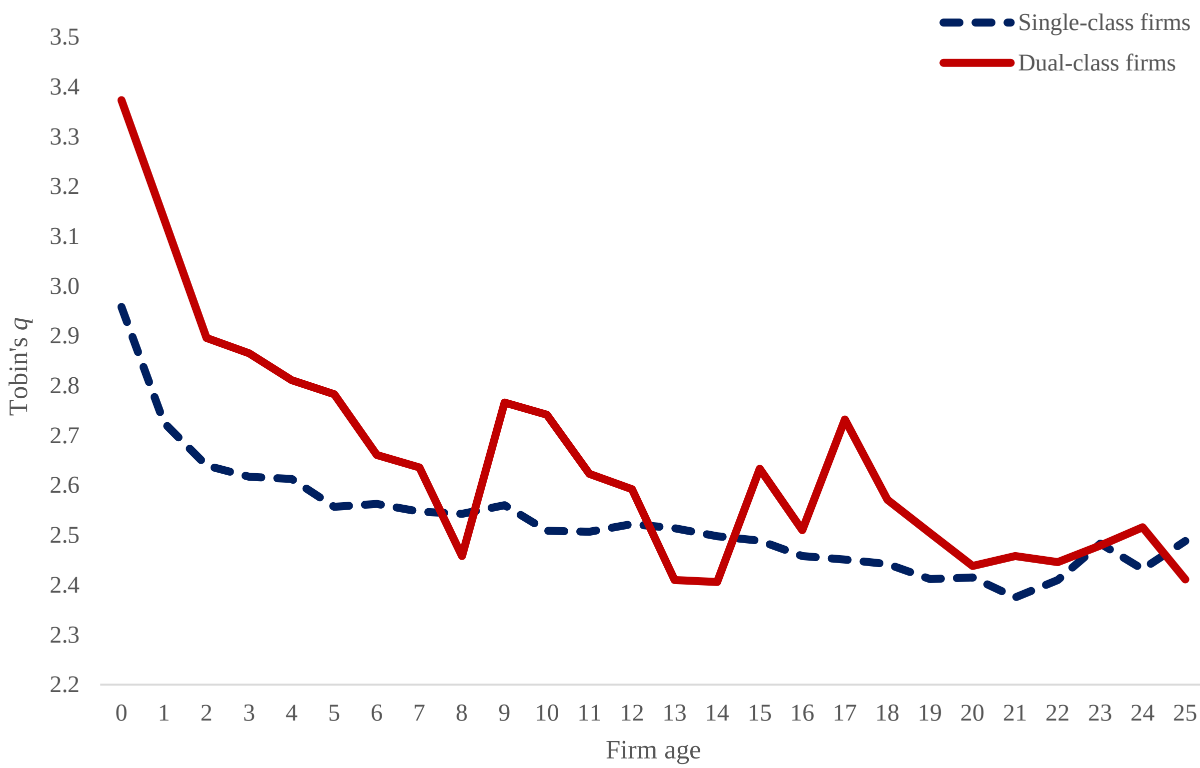

Table 1 – Descriptive Statistics on Dual-Class and Single-Class Firms

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(Total 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 Compustat IPO dates, 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; '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. *, **, and *** represent significance at the 10%, 5%, and 1% levels.

	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(Total 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 presents the results of examining 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 both the inferior and superior classes of shares are publicly traded and their stock price and volume information is available from CRSP 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; 'Log volume (sup. / inf.)' is the natural log of the ratio of trading volumes between the superior and inferior classes of shares. 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.

Panel A: Firm Age

	(1)	(2)
Dependent Variable:	Voting premium (sup. vs. inf. class)	
Mature	3.451**	3.261*
	(2.08)	(1.83)
Log market equity	-0.955***	-0.845**
	(-2.94)	(-2.33)
Log volume (sup. / inf.)	0.376	0.305
	(1.12)	(0.78)
Year fixed effects		Y
R^2	0.036	0.065
Observations	1,343	1,343

Panel B: Firm Growth

	(1)	(2)	(3)
Dependent Variable:	Voting premium (sup. vs. inf. class)		
Sales growth	-2.052**	-2.232**	-2.046*
	(-1.99)	(-1.99)	(-1.85)
Log market equity	-0.867**	-0.781**	-2.513**
	(-2.56)	(-2.08)	(-2.53)
Log volume (sup. / inf.)	0.360	0.299	0.390
	(1.07)	(0.76)	(0.92)
Year fixed effects		Y	Y
Firm fixed effects			Y
R^2	0.029	0.060	0.392
Observations	1,340	1,340	1,340

Table 3 – 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 cumulative abnormal returns (CARs) 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.

	(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 4 – Dual-Class Structure and Firm Value Conditional on Firm Maturity

This table examines the effects of adopting a dual-class share structure on firm value, conditional on firm age (Panel A) and growth (Panel B). Panels A and B use Tobin's *q* as the dependent variable (column 6 of Panel A uses changes in Tobin's *q*). '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. 'Inverse mills' is the inverse mills ratio from the Heckman selection model. Definitions of the other variables are 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.

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	-1.562**
	(2.61)	(1.88)	-	-	(0.63)	(-2.19)
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	-0.928**
	(-1.21)	(0.42)	(-2.61)	(-7.79)	(-0.92)	(-2.22)
Market leverage	-1.862***	-2.488***	-1.850***	-0.863***	-2.205***	9.454***
	(-39.83)	(-11.59)	(-39.77)	(-8.32)	(-9.10)	(3.32)
R&D	6.521***	7.592***	6.483***	5.706***	7.258***	-2.826*
	(28.26)	(6.81)	(27.98)	(6.23)	(6.29)	(-1.74)
Tangibility	-0.288***	0.605	-0.281***	-0.501***	0.202	-1.905*
	(-4.32)	(1.18)	(-4.22)	(-3.53)	(0.57)	(-1.75)
Sales growth	0.189***	0.184**	0.186***	-0.050	0.013	0.317*
	(12.96)	(2.05)	(12.72)	(-1.13)	(0.21)	(1.90)
ROA	0.572***	1.927***	0.606***	2.751***	1.446***	-4.068***
	(6.08)	(4.43)	(6.39)	(8.54)	(2.82)	(-4.09)
Payout ratio	-2.400***	-1.775*	-2.437***	-2.179***	-1.954**	21.106***
	(-16.06)	(-1.67)	(-16.27)	(-11.42)	(-2.39)	(3.28)
Inverse mills ratio	-	-	-	-	-	-8.657**
	-	-	-	-	-	(-2.27)
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	0.104
Observations	151051	12558	151051	44196	3705	19598

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 5 – 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. '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.

	(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 6 – 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 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. 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). 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.

	(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	-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 7 – 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'. The table shows cumulative abnormal returns (CAR) from one day before to one day after dividend increases or initiation announcements from 1971 through 2015. 'Dual' is an indicator variable that equals 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. '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.

	(1)	(2)	(3)	(4)
Dependent Variable:		CAR		CAR / ΔDiv
Sample:	Increases & 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 FEs	Y	Y	Y	Y
R^2	0.565	0.566	0.629	0.628
Observations	5,509	5,509	4,469	4,469

Table 8 – Investment and Employment-*q* Sensitivities for Dual- and Single-Class Firms

This table examines the effects of dual-class structures and firm maturity on corporate investment and employment decisions. Panel A (Panel B) uses a subsample with sales growth rate below the 25th (5th) percentile of the distribution. Columns 1 and 2 (3 and 4) of each panel use capital expenditure scaled by lagged assets (employment growth rates) as the dependent variable. 'Dual' is an indicator variable that equals 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.

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)
Cash flow	-1.846**	2.732***	-7.968*	10.847***
	(-2.29)	(3.55)	(-1.90)	(2.83)
Cash flow × Dual	1.746	-4.975	16.749	14.546
	(0.61)	(-1.09)	(0.71)	(0.75)
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)
Cash flow	-8.077***	0.073	-46.528***	-19.071
	(-2.73)	(0.03)	(-2.74)	(-0.95)
Cash flow × Dual	4.544	4.246	92.868	-77.631
	(0.69)	(0.62)	(0.71)	(-1.05)
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

This table provides estimates of the asset-pricing factor loadings associated with the dual-class status 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 'MOM' 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; and '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 Value

This table examines the ex post effects of switching from dual-class to single-class share structures ('share unification') on firm value 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 lives (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 structures at some point in its life 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.

	(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 1 – Average Relations between Dual-Class Structure, Firm Value and Operating Performance

This table examines the effects of adopting a dual-class share structure on Tobin's *q*, a measure of firm value, and measures of operating performance relative to adopting a single-class share structure. 'Dual' is an indicator equal to one if a firm-year has at least two classes of shares with differing voting rights and zero otherwise. Definitions of the other variables are 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.

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Tobin's *q*	ROA	Operating margin	Asset turnover	Log labor productivity
Dual	0.084	0.003	0.018	-0.022	-0.015
	(1.32)	(0.84)	(1.37)	(-0.97)	(-0.61)
Log assets	-0.010	0.024***	0.080***	-0.050***	0.105***
	(-1.51)	(36.49)	(24.32)	(-14.26)	(27.84)
Age	-0.002**	-0.001***	0.000	0.002***	-0.002***
	(-2.51)	(-8.27)	(0.30)	(5.32)	(-5.72)
Market leverage	-1.859***	-0.180***	-0.116***	-0.268***	-0.091***
	(-39.79)	(-52.36)	(-8.32)	(-12.11)	(-3.98)
R&D	6.555***	-0.863***	-3.807***	-0.432***	-0.714***
	(28.41)	(-32.72)	(-24.35)	(-4.89)	(-7.12)
Tangibility	-0.292***	0.089***	0.277***	-0.407***	-0.440***
	(-4.36)	(14.32)	(8.06)	(-10.39)	(-10.26)
Sales growth	0.195***	0.042***	0.076***	0.459***	0.497***
	(13.42)	(21.48)	(7.45)	(51.96)	(63.20)
ROA	0.570***	-	-	-	-
	(6.05)	-	-	-	-
Payout ratio	-2.449***	0.125***	0.328***	-0.067	0.401***
	(-16.35)	(9.08)	(6.14)	(-0.81)	(4.80)
SIC3 × year fixed effects	Y	Y	Y	Y	Y
R^2	0.303	0.353	0.271	0.524	0.554
Observations	151,051	139,788	139,788	139,788	139,788

Appendix Table 2 – 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 value, 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. 'Dual' is an indicator equal to one if a firm-year has at least two classes of shares with differing voting rights and zero otherwise. Definitions of the other variables are 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.

	(1)	(2)	(3)
Dependent Variable:	Tobin's q (GIM)	Tobin's q	
Sample:	Full	Age based on founding year	IPO before 2003
Dual	0.137***	0.273**	0.168**
	(2.86)	(1.99)	(2.01)
Mature	-0.124***	-0.286***	-0.111***
	(-9.77)	(-6.86)	(-5.16)
Dual × Mature	-0.143***	-0.279*	-0.196**
	(-2.68)	(-1.94)	(-2.19)
Log assets	0.004	0.019	-0.002
	(0.94)	(1.31)	(-0.34)
Market leverage	-1.458***	-2.146***	-1.828***
	(-53.74)	(-29.05)	(-37.86)
R&D	4.226***	6.904***	6.506***
	(30.48)	(23.37)	(26.05)
Tangibility	-0.142***	-0.138	-0.298***
	(-3.43)	(-1.17)	(-4.31)
Sales growth	0.139***	0.227***	0.188***
	(15.81)	(9.44)	(12.15)
ROA	0.656***	0.974***	0.530***
	(11.29)	(7.17)	(5.18)
Payout ratio	-1.838***	-2.610***	-2.469***
	(-20.09)	(-9.78)	(-16.07)
SIC3 × year fixed effects	Y	Y	Y
R^2	0.369	0.327	0.308
Observations	150990	58873	140864