# The Life-Cycle of Dual Class Firm Valuation

by

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## Abstract

We examine an extensive matched sample of U.S. dual and single class firms in 1980-2017 from the time of their IPO, and document that the valuation difference between dual and single class firms varies over their life cycle. On average, around the time of the IPO, dual class firms have higher valuations than single-class firms. Over time, this valuation premium tends to dissipate, whereas the difference between voting and equity stakes of the controlling shareholders of dual class firms (the "wedge") tends to increase. Our results provide support for the availability of dual class structures at the IPO as well as the desirability of age-based sunset provisions for such structures.

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# The Life-Cycle of Dual Class Firm Valuation


## Abstract

We examine an extensive matched sample of U.S. dual and single class firms in 1980-2017 from the time of their IPO, and document that the valuation difference between dual and single class firms varies over their life cycle. On average, around the time of the IPO, dual class firms have higher valuations than single-class firms. Over time, this valuation premium tends to dissipate, whereas the difference between voting and equity stakes of the controlling shareholders of dual class firms (the "wedge") tends to increase. Our results provide support for the availability of dual class structures at the IPO as well as the desirability of age-based sunset provisions for such structures.



*JEL classification:* G32; G34

*Keywords:* Dual class shares; life cycle; anti-takeover defenses; unifications; sunset provisions

## 1. Introduction

IPOs of dual class shares have become relatively popular in the recent decade, following the example of some technological "superstars" such as Google and Facebook. For example, we document (in Table 8) that about 15% of U.S. IPOs over 2011-2017 had a dual class structure. Firms adopting the dual class equity structure have at least two classes of common shares: high-voting-power shares, owned primarily by firm founders or controlling shareholders, and low-voting-power shares, held typically by non-controlling or outsider shareholders.

Dual class structure constitutes an extreme example of anti-takeover provisions, as the controlling shareholders who own primarily high-voting-power shares generally have sufficient control to repel any unwanted takeover or any other shareholder activist campaign. Thus, agency problems at dual class firms are potentially more severe than at single class firms. Previous literature suggests that private benefit extraction may be higher in dual class firms, causing, in general and on average, a lower relative valuation of dual class firms (Gompers, Ishii and Metrick, 2010; Masulis, Wang and Xie, 2009; Smart, Thirumalai and Zutter, 2008).

However, another strand of research identifies some potential benefits of the dual class structure (Lehn, Netter and Poulsen, 1990; Bebchuk, 2003). These benefits accrue especially when outsider public shareholders are less informed than the controlling shareholders (Alchian and Demsetz, 1972) or overly concerned about short-term performance (Stein, 1988; 1989). Granting more power (i.e., voting and intervention rights) to public shareholders may also limit firm's ability to commit to strong relationships with other stakeholders (Laffont and Tirole, 1988; Shleifer and Summers, 1988) and to make long-term, firm-specific investments (DeAngelo and DeAngelo, 1985).

We contribute to the debate on dual class firms by examining how the costs and benefits of dual class stocks change over the life cycle of their firms. For example, we are the first to present evidence on how the relative valuation of dual versus single class firms varies with firm listing age (i.e., time since the IPO). Our two main (and not mutually exclusive) hypotheses are, first, that the potential benefits of dual class structures – such as protecting the unique vision of the entrepreneur and encouraging firm-specific human capital investments by the entrepreneur (Lehn, Netter and Poulsen, 1990; Bebchuk, 2003) – may be decreasing over time after the IPO, and, second, that the agency costs associated with dual class structures may be increasing over time. Combining both hypotheses, Bebchuk and Kastiel (2017) argue that, consequently, dual class structures become more inefficient as the firm ages. Bebchuk and Kastiel (2017) advocate a sunset clause for dual class firms, which would require the "non-interested" public shareholders of the firm to vote on whether or not to extend the dual class structure, scheduled some pre-determined number of years after the IPO. If the extension proposal is declined, firms would unify the low- and high-vote shares, i.e., convert all shares into a single class of shares with "one share one vote".

Our main finding is a substantial variation in the relative valuation of dual class firms over their life cycle. At the IPO, dual class firms tend to have higher valuations - at the IPO year-end the Tobin Q of dual class firms is, on average, 13% higher than that of the matched single class firms. However, this initial valuation premium of dual class firm dissipates in the years after the IPO, and on average dual class firms start trading at a discount relative to comparable single class firms about six to nine years after the IPO.

We also explore the cross-sectional and time-series variation in the above-described life cycle of dual class firm valuations. In cross-sectional analysis, we find that only dual class firms with an initial valuation premium over comparable single class firms exhibit the life-cycle effect;

their initial valuation premium declines over time until on average in the long term their valuation is about equal to that of their matched single class counterparts. In comparison, there is no evidence of a life cycle in the valuation of firms with an initial valuation discount, such that their long-run valuation discount remains significant and similar to the discount at the IPO. The main observed time-series variation is that in the second half of our sample (i.e., the 21st century) dual class firms exhibit a larger mean initial premium and a smaller mean long-run discount than in the earlier part of our sample. Perhaps over time the market learnt how to offer "better" dual class IPOs and how to restrain their long-term valuation discount problems.

Two other findings help interpreting our results. First, we show how the equity and voting stakes of the controlling shareholders in dual class firms change in the years after the IPO. We find that the difference between the voting and equity stakes of the controlling shareholders of dual class firms (the "wedge") tends to increase as the firm ages. According to one of our estimates, the mean wedge increases from 16% one year after the IPO to 22% five years after the IPO, and to 26% nine years after the IPO. The increase in wedge with firm age suggests that dual class firms' potential agency problems aggravate as these firms mature,[1] contributing perhaps to their eventual valuation discount.

Second, we examine voluntary firm-initiated dual class share unifications (i.e., recapitalizations into a single class structure), and find that unification frequency initially increases and then decreases with firm age. Voluntary unifications may be considered as a self-correcting mechanism of the firm, yet only about 20% of the dual class firms unify their shares.

[1] Masulis et al. (2009) show that a wider wedge aggravates dual class firms' agency problems.

For policy makers – including regulators, index providers, proxy advisors, and stock exchanges – our finding that many dual class firms have a valuation premium over single class firms during the first few years after the IPO, should provide some legitimacy to dual class financing. This average initial valuation premium suggests that, earlier in their life cycle, the dual class structure may provide net benefits for at least some set of firms. On the other hand, our evidence that, for dual class firms with an initial valuation discount, this discount persists in the long-term, suggests that their public shareholders and the firm itself may benefit from a sunset clause of the dual class structure.

Section 2 provides a concise background of the literature on dual class financing and presents the hypotheses. Section 3 describes the sample and data. Sections 4 and 5 report our results. Section 6 discusses the regulatory implications of our evidence, and Section 7 concludes.

## 2. Dual class stocks' life cycle

### 2.1. Some background

The history of dual class share structures dates back to 1898, and since then has undergone several evolutionary stages - see Howell (2017) for a review. A significant minority of publicly traded firms have dual class structure. In 2015, about 8% of the S&P 500 and 9% of the Russell 3000 firms were dual class (Mattheus, 2016). Dual class financing is also wide-spread in Europe, accounting for over 20% of the traded firms (Bennedsen and Nielsen, 2010).

The dual class structure has been advocated as a solution to two economic inefficiencies of publicly traded firms. First, outsider shareholders may be less informed than insiders (Alchian and Demsetz, 1972), and, second, they may be overly concerned about short-term performance (Stein, 1988; 1989). These potential deficiencies of public shareholding may be particularly problematic

for firms at the early stage of their lives, such as the first few years following the IPO. Lehn, Netter and Poulsen (1990) argue that at the IPO stage, characterized by fast-growth of the firm, the insiders managing the firm have to invest substantial and largely firm-specific human capital resources in the firm, in order to advance firm's long-term potential and goals. Thus, for a few years following the IPO date, it may be more efficient to give these insiders sole control and isolate them from outside pressures. In particular, in this case public shareholders may rationally agree to acquire inferior-vote shares and grant the entrepreneurs disproportionate power because at the IPO the entrepreneurs' leadership and vision offer a unique value to the firm. Consistent with this view, Jordan, Kim and Liu (2016) show that dual class firms face lower short-term market pressure (for example, have fewer transient short-term institutional investors).

Bebchuk (2003) highlights the entrepreneur's perspective,[2] showing theoretically that if an entrepreneur possesses substantial private information that cannot be disclosed to the public at the IPO, this may result in a higher private valuation of the corporation than the valuation estimated by less-informed outside shareholders. This discrepancy in valuation renders the entrepreneur reluctant to issue shares. Dual class financing, through an IPO with inferior-vote shares, alleviates the asymmetric information problem because it reassures the entrepreneurs that they would not lose control, and that all of their private information and plans would be utilized and implemented. In short, the dual class structure may be necessary to convince the entrepreneurs to go public.

Finally, dual class financing may be reassuring for some firm stakeholders, such as its large customers or its partners in joint ventures, who may prefer stable firms and stable relationships (Johnson, Karpoff and Yi, 2018). Therefore, the preservation of control afforded by dual class

[2] Bebchuk (2003) discusses antitakeover arrangements in general rather than dual class structure in particular. However, given that dual class financing is a potent takeover deterrent as well, we employ this logic to our case.

stock fortifies the stability and credibility of the firm in the eyes of its trading partners. This "bonding hypothesis" of the constructive value of limiting shareholder rights is explored regarding staggered boards in Cremers, Litov and Sepe (2017), who show that limiting the shareholders' ability to dismiss directors – through granting directors staggered three-year terms – is associated with higher shareholder value for firms where stakeholder relationships and firm-specific investments seem more important.

Opponents of the dual class stock structure argue that it constitutes an extreme example of antitakeover provisions. The insiders owning high-voting-power shares generally have sufficient control to prevent any unwanted takeover or other shareholder discipline. Gompers, Ishii and Metrick (2010) and Masulis, Wang and Xie (2009) argue that this excess power affords enlarged private benefit extraction by entrenched insiders and results in lower firm valuations.

The costs and benefits of dual class shares can be summarized as follows:

$$(1) \qquad Q_{dual} = Q_{single} + \Delta Q_{LV} + \Delta Q_{Agency},$$

where $Q_{dual}$ is the relative valuation (e.g., Tobin's Q) of a dual class firm, $Q_{single}$ is the relative valuation of an otherwise comparable firm that has one class of shares only; $\Delta Q_{LV}$ is the unique value contribution of the dual class firm's entrepreneurs attributed to their leadership and vision (This vulnerable special contribution requires a dual class structure to protect it from outside pressure.); and $\Delta Q_{Agency}$ is the contribution of additional agency problems (arising from having the dual class structure) to firm valuation.

The discussion above suggests that $\Delta Q_{LV}$ is positive, while $\Delta Q_{Agency}$ is negative. Further, equation (1) also illustrates that dual class financing can be optimal for young firms. In particular,

on the IPO date, the market valuation of the dual class firm ($Q_{dual}$) may exceed that of the single class firm ($Q_{single}$) if $\left|\Delta Q_{LV}\right| > \left|\Delta Q_{Agency}\right|$.

### 2.2. The life cycle of dual class firm valuations

It is well known that firm's valuation tends to change with firm age. Loderer, Stulz and Waelchli (2017) use an extensive sample of U.S. firms in 1978-2013 to document a significant deterioration of firm's Q with "listing age" (i.e., with time since the IPO). They argue that firm rigidities develop over time, making firms more focused on managing assets in place and less successful in generating growth opportunities. This implies in our framework that $\partial Q_{single}/\partial T < 0$, where T is the firm's listing age.

Bebchuk and Kastiel (2017) propose that $\Delta Q_{LV}$ and $\Delta Q_{Agency}$ are a function of firm age. $\Delta Q_{LV}$, the valuation benefits due to the entrepreneurs' leadership, vision and special skills that is subject to information asymmetry vis-à-vis the shareholders, erodes over time as the firm scale and attributes and the general economic environment change and as investors learn more about the firm. In the years after the IPO, the vision of the founders is largely fulfilled and the special skills of the founders may no longer be necessary. This suggests that $\partial \Delta Q_{LV}/\partial T < 0$.

According to Bebchuk et al. (2017), the agency problems effect on firm valuation, $\Delta Q_{Agency}$, also changes with firm's age. They argue that entrepreneurs tend to dilute their holdings in the firm (i.e., sell shares) in the years following the IPO due to wealth diversification considerations. The decline in controlling shareholders' equity holdings cuts the marginal cost of private benefits consumption and incentivizes them to further increase private benefits. Under such

a scenario, agency problems worsen with dual class firm's age, leading to an increase in the agency-induced value discount, i.e., $\partial \Delta Q_{Agency}/\partial T < 0$.

If both $\partial \Delta Q_{Agency}/\partial T < 0$ and $\partial \Delta Q_{LV}/\partial T < 0$, the value difference between otherwise-identical dual and single class firms would decrease over time, or turn more negative over time. Thus, even if at the IPO the entrepreneurs' unique value contribution that must be protected from shareholder interference, $\Delta Q_{LV}$, outweighs the agency-induced discount, $\Delta Q_{Agency}$, the changes of benefits and costs over time imply that, at some point of time after the IPO, the dual class structure becomes inefficient and decreases the market valuation ($Q_{dual} < Q_{single}$).

Bebchuk and Kastiel (2017) also argue that dual class firms are unlikely to voluntarily unify their shares (i.e., transform all shares into a single class with one vote per share) even when $Q_{single}$ exceeds $Q_{dual}$, because for the controlling shareholder it is not optimal to do so. Controlling shareholders would typically lose considerable voting power upon unification while gaining only a fraction (equal to their equity stake) of any market value increase. Hence, the potential market value gain has to be relatively large before the controlling shareholders agree to give up their superior voting power and unify all firm shares, especially if there are significant private benefits associated with having voting control. This is the basis of Bebchuk and Kastiel's proposition to add a sunset provision to dual class share IPOs, which provision would mandate a binding shareholder vote to unify the dual class shares, a pre-specified number of years after the IPO.

## 2.3. Hypotheses

We seek to provide evidence on the life cycle of dual class firm valuations. Previous dual class firms' life cycle literature examines mainly the hypothesis that dual class firm structures prolong their life relative to single class firms by deterring hostile takeover attempts.[3]

We start by examining one of the proposed triggers for dual class firm valuation changes over the life cycle – the possible dilution of controlling shareholders holding as firm matures. We will test this proposition by computing a measure of the conflict of interest between controlling and outside shareholders for dual class firms, defined as the difference between controlling shareholders' voting rights and their cash flow rights (the "wedge"). In single class firms the wedge is zero, while in dual class firms it is positive. The higher the wedge, the lower the cost of private benefits consumption for controlling shareholders, holding voting power constant. Thus, higher wedges increase temptations to consume private benefits at the expense of public shareholders and aggravate agency problems – see the evidence of Masulis, Wang and Xie, (2009).

If controlling shareholders of dual class shares attempt to preserve their voting power, hence dilute primarily their equity stake after the IPO (by selling predominantly their inferior-vote holdings, for example), the wedge increases along dual class firm's life cycle. Thus, we test:

***Hypothesis 1****:* The stake of controlling shareholders in dual class firm's equity tends to decrease with firm's age, and the wedge tends to increase.

We turn next to our central variable: the relative valuation of single- and dual-class firms, and examine its change along firm's life cycle. Bebchuk and Kastiel (2017) conjecture that the

[3] Smart and Zutter (2003) study a sample of IPOs between 1990 and 1998 and show that dual class firms experience fewer control events. Jordan, Kim and Liu (2016) extend the sample to 1991-2011, and compare takeover activity of matched samples of single and dual class firms. They also find that dual class firms have a lower probability of being taken over.

benefits of the dual class structure dissipate in the years following the IPO while the (agency) costs increase. This gives rise to our central corollary:

***Hypothesis 2****:* The relative valuation of dual- vs. comparable single-class firms, $Q_{dual}$ minus $Q_{single}$, decreases with a firm's age.

Finally, we examine voluntary dual class share unifications. Voluntary unifications are an interesting "self-correct" mechanism initiated by the firm itself when it senses that the dual class structure has become stale and counterproductive. Bebchuk and Kastiel (2017) propose that unifications are rare, i.e., that dual class structures persist longer than they should, even when they decrease market valuation. This is because unifications typically counter the interests of the controlling shareholders. Upon unification, controlling shareholders typically lose considerable voting power and thus considerable private benefits, while they receive only a fraction of the market valuation gain (equal to their equity stake). Furthermore, if controlling shareholders' equity stake declines over time, their potential gain upon unification diminishes with firm's age, which should further reduce unification frequency. Hence, regarding unifications, we test

***Hypothesis 3****:* Voluntary firm-initiated dual class share unifications are rare, and their frequency declines with firm age.

### 2.4. Contribution and relation to previous research

We contribute to the long academic debate about the merit of dual class financing. Burkart and Lee (2008) summarize some theoretical arguments, and Adams and Ferreira (2008) summarize the mixed empirical results on the economic desirability and consequences of dual class financing. Our main contribution is in examining the dynamic age-dependent relative valuation of dual- vs.

single-class firms. Our tests provide supportive evidence for Bebchuk and Kastiel (2017)'s hypothesis that the efficiency of dual class structures declines with firm age.

In the context of the life-cycle literature, we contribute the observation that the efficacy of various governance structure such as the dual class structure changes over the life cycle. In a related paper, Johnson, Karpoff and Yi (2018) find that takeover defenses – such as staggered boards and voting supermajority requirements – tend to enhance firm value at the IPO, yet become less efficient over time. Both their and our studies indicate that the impact of various governance arrangements changes along firm's life cycle.

Finally, it is important to distinguish our research from the concurrent study by Kim and Michaely (2018). We view Kim and Michaely (2018) and our study as complimentary. Kim and Michaely (2018) study the dynamic aspects of dual class firm valuations, distinguishing between dual class firms that are younger than 11 years and dual class firms that are older than 11 years. Our paper more comprehensively studies the life cycle aspect, as we provide finer age screens (1-3, 4-5, 6-8, and 9+ years after the IPO), which affords a more precise observation of any dual class valuation premium change along the life cycle. We also consider not only full-sample regression tests as Kim and Michaely (2018), but also examine a matched sample of single and dual class firms starting at their IPOs, in an attempt to mitigate sample selection concerns. Finally, we provide evidence on dual class-specific phenomena such as the wedge between voting and equity rights and dual class share unifications that shed light on the problems of decreased efficiency of aging dual class firms. In our view, the main contribution in Kim and Michaely (2018) is in identifying potential increases in agency costs, increases in stock risks, and decreases in dual class benefits, when one compares young and mature dual class firms. Their extensive comparisons provide

useful insights into potential micro-mechanisms behind the life cycle of dual class firm valuations that we identify.

## 3. Sample

We study life-cycle phenomena in dual-class firms using two samples, denoted as the "full sample" and the "matched sample", respectively. The full sample comprises of 9,414 U.S. companies, listed on the NYSE, NYSE MKT or NASDAQ, that had an initial public offering (IPO) during 1980-2017. A subset of the full sample, the matched sample includes 538 dual- and 538 single-class firms that are matched in the IPO year according to several key characteristics. The sample starts in 1980, as our information on dual-class IPOs commences on that year.

### 3.1. The full sample

To construct a sample of dual-class firms, we employ several sources. First, we collect data on dual-class IPOs during 1980-2017 from Ritter (2018). Second, we use Gompers, Ishii and Metrick (2010, henceforth GIM)'s comprehensive list of dual-class firms spanning 1994 – 2002.[4] All firms on GIM's list that are not found in Ritter (2018)'s data are added to the sample if their stock price first appears on CRSP in January 1980 or later. Last, as our focus is on the life cycle of dual class firms, we only consider dual class firms that already have a dual class structure at their IPO, thus excluding a small number of firms that recapitalize into the dual class structure subsequent to their IPO. The above procedure generates a sample of 714 firms that went public with a dual-class share structure during 1980-2017.

[4] We are grateful to Andrew Metrick for making this data available on his website.

We next construct a sample of single-class firms from the universe of CRSP/ Compustat merged firms listed on the NYSE, AMEX or NASDAQ that have their IPO without dual class structure during 1980-2017. This procedure generates our 'full sample' of 8,700 single-class firms. Altogether, our sample comprises 9,414 firms that went public during 1980-2017, out of which 7.6% had a dual-class share structure at their IPO.

### 3.2. The matched sample and the matching procedure

We seek the best single-class match for each dual-class firm in our full sample. The matching parameters employed are:

1) Firm industry. The matched single and dual class firms must be in the same Fama and French (1997, henceforth FF) industry group. Following the previous literature, we exclude all firms in the banking and insurance sector firms (FF industry groups 45 and 46) and in regulated sectors (FF industry group 31), leaving us with forty-five industry groups. This reduces sample size to 8,042 firms, of which 8.1% (653 firms) had dual class structures.
2) IPO date. The single class firm must have an IPO not more than twenty-four months apart from its matched dual-class IPO.
3) Firm size. The matched firms must be similar in size on the eve of the IPO, i.e., the total assets of the single class match must be between 50% and 200% of that of its dual-class match.
4) ROA. After satisfying the above screens, and in case there are more than one single class matching candidate, we choose the single class firm whose Return on Assets (ROA) prior to the IPO is closest to that of the dual class firm. All data are based on annual data at the end of the fiscal year. In almost all cases, we match on the ROA at

the fiscal year-end preceding the IPO, though if that is missing, we match in a few cases on the ROA from the fiscal year prior to that.

We consider these criteria as presenting only the minimum requirements for the control firms to be reasonably comparable to the dual class firms. We will consider in detail to what extent various other firm characteristics at the time of (as well as after) the IPO are comparable across our matched dual class and single class firms. The main empirical challenge is that adding criteria or tightening the above criteria, reduces the matched sample size. We hope that the four matching criteria outlined are a reasonable compromise between having fewer matching criteria but a larger sample of dual class firms, and having more extensive and tighter matching criteria but a significantly smaller sample of dual class firms (thereby rendering our sample less representative of dual class firms in general). When we examine how successful our matching procedure is, we also offer some robustness tests. It is also noteworthy that the selected procedure enables us to prioritize firm listing age (IPO date proximity) that is the key focus of our life cycle analysis, and that previously used matching procedures such as the propensity score matching procedure of Gompers et al. (2010) ignore.

The final matched sample comprises of 538 dual-class firms and 538 matched single-class firms.[5] Given that we have 653 non-financial dual class firms in the full sample, our matched sample size of 538 firms implies that for 115 dual class IPOs (about 18% of the initial sample) we cannot find a proper match using the criteria above.

[5] Each single class firm is chosen as a match for only one dual class firm, which guarantees that our matched sample includes the same number of dual and single class firms.

## 4. Differences between Single and Dual Class Firms

### 4.1. Differences in basic characteristics

Table 1 explores differences in several key characteristics between single and dual class firms in our full sample. We provide the medians of various firm characteristics for the samples of single and dual class firms separately, as well as the p-values for whether the medians are statistically different across the samples at those particular snapshots in time. This provides a first look at how these firm characteristics vary over time, and how stable any differences between single and dual class firms are. All variables and their data sources are detailed in Appendix A.

Dual class firms have significantly larger total book value of assets than single class firms. Dual class firms are also significantly more levered and more profitable, both in terms of return on assets (ROA) and return on equity (ROE). However, their firm valuations, as reflected by Tobin's Q, tend to be lower than those of single class firms. We also find insignificant differences in sales growth and capital expenditures between single and dual-class firms. However, single class firm tend to invest more in R&D.

(Insert Table 1 about here)

Table 2 reports the medians of various firm characteristics at the end of the fiscal year right after the IPO. We distinguish single- and dual-class firms, and present statistics for both the full sample and the matched subsample. In the full sample, most of the differences between single and dual class firms noted above (and shown in Table 1) occur already at the time of the IPO. For example, dual class firms tend to be larger and more leveraged than single class firms, though with lower R&D expenditures, at the time of the IPO. It is also interesting that dual class firms are older at the IPO (median of 11 years since incorporation compared to 7 years of single-class firms). This

suggests that dual class firms postpone their going public, and utilize debt financing prior to the IPO. Finally, there is an insignificant difference in issue size between single- and dual-class firms: In single (dual) class IPOs, the new shares account for about 29% (30% respectively) of all shares outstanding after the IPO.

However, the comparison between single and dual class firms at the IPO in the full sample does not consider significant differences between single and dual class firms in, for example, industry composition. Once we match dual class firms at the time of their IPO with single class firms whose IPO occurred around the same time – and that are in the same industry group, with similar book value of assets and similar profitability at the time of their IPO – we find that single and dual class firms appear to have similar characteristics at the time of their IPO.

Specifically, in the resulting matched sample the characteristics of single and dual class firms are similar – with statistically insignificant differences – not only for the two characteristics that were used in the matching procedure (assets size and ROA) but also for the other firm characteristics considered such as sales growth and R&D intensity. This suggests that matching on only assets size and ROA, together with industry group and similar time of the IPO, seems to suffice, and generates a matched sample where dual and single class firms are comparable across many other dimensions as well.

(Insert Table 2 about here)

### 4.2. Wedge widening after the IPO

We retrieve data of the equity ownership by insiders from SEC filings available on EDGAR. As EDGAR data starts in 1995, equity ownership and wedge data are available for 1995-2017 only. Further, firms are allowed to file their first 10-K report within 18 months of the IPO.

Hence, comprehensive data on equity ownership is available starting in the year following the IPO (i.e., year IPO+1). These data limitations somewhat decrease our sample size.

Table 3 reviews the evolution of controlling shareholders' holdings and wedge in the years following the IPO, in consideration of Hypothesis 1. In Panel A, the full sample is examined. One year after the IPO, the mean equity ownership of the founders or controlling shareholders amounts to 49.93% of the total firm equity. In subsequent years, these holdings sharply drop, such that five years after the IPO the mean ownership of controlling shareholders in dual class firms equals 37.13%. After this, the equity ownership of the controlling shareholders is fairly stable, and nine years after the IPO the mean equity ownership of the controlling shareholders equals 38.12%.

(Insert Table 3 about here)

For dual class firms, the decrease in the equity holdings of controlling shareholders is accompanied by an increase in the wedge between their voting and equity stakes. Table 3 reports that the mean wedge increases from 16.22% one year after the IPO to 22.01% five years after the IPO, and to 26.38% nine years after the IPO. The increase in the wedge subsequent to the IPO is caused either by controlling shareholders selling some of the inferior-vote shares they may hold, or by the firm issuing new equity with inferior-votes, as typically only inferior-vote shares are traded on the public markets. Notably, some dual class firms split their shares by distributing non-voting shares to all shareholders (for example, Google class C). This affords controlling shareholders to “cash in” (sell some of their non-voting shares) without conceding voting power. Such actions also increase the wedge.

The number of dual class firms in our sample decreases sharply in the years after the IPO – see a concise survival analysis in Appendix B. We start with 358 dual class firms for which we were able to find insider ownership data, yet nine years after the IPO only 151 dual class firms

remain. This raises the possibility that the life cycle variation documented in Table 3 – such as the decline in controlling shareholders' equity ownership and the increase in the wedge – is biased by survivorship factors. For example, if surviving dual class firms already had lower insider ownership and a higher wedge from the time of their IPO, then the decrease in equity proportion and increase in wedge documented in Panel A are exaggerated or even spurious.

As a robustness test, we focus on 149 dual class firms for which we have complete holdings data for the first five years after the IPO (see Panel B in Table 3). The mean controlling shareholders' equity stake decreases from 53.24% on year IPO+1 to 38.11% on year IPO+5, and the mean wedge increases from 19.33% on IPO+1 year-end to 22.53% on IPO+5 year end. The decrease in holdings and the increase in wedge are statistically significant at the 1% level. This indicates that the equity stake dilution and wedge widening are robust post-IPO phenomena in dual-class firms, consistent with Hypothesis 1.

## 5. Life Cycle Impact on the Relative Valuation of Dual Class Firms

### 5.1. Valuation premium change

This section considers how firm value, as proxied by Tobin's Q, is associated with having a dual class structure, and how this association changes over the firm's life cycle.[6] Specifically, we test Hypothesis 2 stating that the valuation difference between dual and single class firms decreases over time.

First, Table 4 reports the mean Tobin's Q in separate samples of single and dual class firms as a function of firm's public age (the number of years from the IPO). In the full sample, the relative

[6] It is noteworthy that in the assessment of the Q of dual class firms we assume that the market value of any non-trading high-vote share equals the price of its traded low-vote share counterpart. This follows Villalonga and Amit (2006), who argue the valuation premium of the high-vote share is offset by its non-tradability discount.

valuation (Q) of dual class firms is on average significantly lower than that of single class firms, both at the time of the IPO and in all of the following years. The finding is consistent with previous evidence such as Gompers, Ishii and Metrick (2010) in the U.S., and Bennedsen and Nielsen (2010) in Europe. Previous literature has generally interpreted this discount as suggesting that dual class structures are inefficient because they are associated with higher agency costs, serving mainly their controlling shareholders interests at the detriment of outside shareholders.

(Insert Table 4 about here)

However, our matched sample analysis in Panel B discloses a different picture – see also Figure 1. When we compare dual class firms to ex-ante similar matched single-class firms (where matching is based on industry, IPO date, firm size and firm ROA, as explained above), we find a valuation premium for dual class firms around the time of their IPO. Specifically, at the end of the first fiscal year following the IPO, the mean Tobin's Q of dual class IPOs (3.12) exceeds that of single class firms (2.76) by about 13%, which difference is statistically significant at the 5% level.

(Insert Figure 1 about here)

Table 4 also shows that the values of both single and dual class firms tend to decrease significantly in the years subsequent to the IPO. However, this life cycle valuation effect is particularly strong for firms with dual class structure. Specifically, while firms with dual class structure have on average a higher valuation than their matched single class firms shortly after the IPO, four years afterwards the valuation premium of dual class firms relative to matched single

class firms disappears, and after six years, dual class firms tend to have a significantly lower Tobin's Q. However, a multivariate analysis is required before any conclusions can be drawn.

Table 5 examines the relative valuation of dual versus single class structures in multivariate regressions using the full and matched sample. We run pooled panel regressions of Tobin's Q on various control variables previously demonstrated in the literature as being associated with Tobin's Q, adding to the list of explanatory variables a dual class dummy variable.

We first run these regressions combining all observations of the full sample. Then, we use separate subsamples of cohorts of firms, progressing along firm's life cycle. This approach follows Johnson et al. (2018), who study antitakeover provisions for single class firms over the life cycle. The four life cycle cohorts suggested by the matched sample results in Figure 1 are the 1 – 3 years cohort, the 4 – 5 years cohort, the 6 – 8 years cohort, and the > 8 years cohort (or 9+ years cohort) after the end of the fiscal year of the IPO.[7]

(Insert Table 5 about here)

In column 1 of Panel A, we combine all firm-year observations across the firms' life cycle, and find no evidence that, on average, dual class firms and single class firms have a different Tobin's Q. The coefficient on the dual class dummy equals 0.004 with a t-statistic of 0.08. This shows that the results in previous literature that show an average valuation discount for dual class firms do not hold in our more extensive 1980-2017 sample.

In column 2, using only observations for firms from the 1 – 3 years cohort, the coefficient of the dual class dummy equals 0.24, suggesting that dual class firms have a Tobin's Q that is about 10% higher than that of comparable single class firms (=0.24/2.47, where 2.47 is the average Q of

[7] Within each of these firm age cohorts, the mean valuation premium of dual versus single class firms appears similar – see Figure 1. The results hold when we use different age cohorts – see our robustness test results in Table 6.

single class firms in the full sample in years 1 – 3 after the IPO year - see Table 4). This first three years' valuation premium of dual class firms is statistically significant at the 1% level.

However, on average, the initial dual class valuation premium tends to decline as firms mature. In the 4 – 5 years cohort, the dual class premium is only slightly positive and statistically insignificant, and for the two later life cycle cohorts it becomes significantly negative. For example, using the sample of firms that are nine years or more after the IPO, the dual class dummy has a coefficient of -0.22, suggesting that those dual class firms have a Tobin's Q that is on average about 10% (=0.22/2.11) lower than that of single class firms.

In Panel B of Table 5, we document results for the matched sample. The picture is almost identical, albeit with weaker statistical significance. In the first three years after the IPO year, dual class firms have on average a 0.22 higher Tobin's Q than single-class firms (compared to 0.24 in the full sample), and this premium turns into a discount in Q of 0.17 nine years or more after the IPO year (compared to a discount of 0.22 in Panel A). Evidently, the life-cycle dependence of the relative valuation of dual- and single-class firms is robust, i.e. a similar pattern appears in both the full and matched samples.

In sum, the valuation evidence in this section supports our Hypothesis 2. Dual class firms tend to have a valuation premium relative to comparable single class firms at the IPO, which premium tends to dissipate in the years following the IPO. On average, only six years after the IPO, the dual class structure starts being associated with lower valuations. Relative to the prior literature, the main new results are twofold. First, on average, there is no evidence that dual class firms have a different value than single class firms, if one does not incorporate the firm's life cycle.

Second, the relative valuation of dual- and single-class firms changes along firms' life cycle, with an initial valuation premium for dual class firms in the early years after the IPO, and a

ultimate valuation discount for dual class firms starting about six years after the IPO. A concurrent study, Kim and Michaely (2018), also finds that young dual class firms have a valuation premium over young single class firms, a premium that is not present when they compare dual- and single-class firms that are older than 11 years. Thus, the dissipation of the initial valuation premium of dual class firms appears robust.

In terms of our basic model in equation (1), $Q_{dual} = Q_{single} + \Delta Q_{LV} + \Delta Q_{Agency}$, the results imply that $\Delta Q_{LV} > \Delta Q_{Agency}$ for firms at the beginning of their life cycle as publicly traded firms. Hence, on average, in the first public years of the firm, the valuation premium due to founders' vision and leadership more than offsets the discount caused by any higher agency problems associated with dual class structures. In a study of firm innovativeness, Baran, Forst, and Via (2018) find that in the first five post-IPO years dual class firms exhibit superior patent output (relative to matched single class firms) that mitigates the negative effect of disproportionate insider control.

However, our above interpretation should be accompanied with considerable caution because the choice of a dual class structure at the IPO may be an endogenous decision. For example, private firms with particularly strong growth opportunities may be more likely to choose a dual class structure when they first sell shares in public markets. This alternative interpretation reverses the causality and argues that the initially higher Tobin's Q (capturing better growth opportunities) triggers the choice of the dual class structure. In short, a selection (or endogeneity) effect might exist, such that the relative valuation of dual class firms compared to single class firms

at the time of their IPO cannot be interpreted as being informative about the relative (in)efficiency of the dual class structure as compared to the single class structure.

Our empirical design of constructing a matched sample of single and dual class firms with similar ex-ante characteristics (see Table 2) and similar issue date is intended to minimize the likelihood of a substantial initial difference between single and dual class firms, mitigating the influence of selections effect at the IPO. However, we recognize that we cannot completely rule out reverse causality or other selection effects.

However, we argue that under both interpretations the firm plausibly benefits from the dual class structure. In the first interpretation, the firm benefits from dual class structure by allowing less market discipline in order to better facilitate the implementation of the founders' long-term vision, such that both public and controlling shareholders are better off. In the alternative interpretation, it is possible that young firms with the strongest growth opportunities would achieve an even higher firm value at the time of their IPO if they would have chosen a single class structure rather than a dual class structure. However, the choice of the dual class structure suggests that the controlling shareholders have a relatively strong preference for keeping strong control after the IPO, and thus may have chosen to delay their IPO for a number of years in case the dual class financing structure would not have been available. Such a delay harms both firms and public shareholders because without public funds break-through firms such as Google and Facebook could not develop that fast, and because without these firms IPOs, public could not buy their shares and could not participate in the nice profits accompanying their success.

In short, even if the alternative interpretation is correct and any valuation premium of dual class firms at the IPO is driven by selection effects, it seems plausible that both public shareholders and controlling shareholders benefit from an earlier IPO and thus from having the dual class

structure available. In further (unreported) tests we find that the stock return alphas of dual class (and single class) stock portfolios at various age-cohorts are generally insignificant. (We use calendar-time value-weighted portfolios and the four factors of the Fama-French-Carhart model.) This reinforces prior evidence by Smart et al. (2008) that dual class firms have normal returns that are comparable to their single class counterparts. Again, dual class structures do not appear to harm public shareholders.

### 5.2. Robustness tests

In our first robustness test, we examine the effect of using different age cohorts. Some readers may ponder about our choices: 1) to include year IPO+3 in the 1-3 years cohort (and not in the 4-5 years cohort); 2) to lump together years 9+ (that is firms with listing age larger than eight years); and 3) to exclude the IPO year. In response, we rerun the Tobin's Q regressions in the matched sample on the following listing age cohorts: 0-2, 3-5, 6-8, 9-11, and 12+ years. This alternative cohort division is attractive also because it employs fixed three year cohorts up until a listing age of 12 years.

Panel A of Table 6 presents the results of Tobin's Q regressions in the matched sample using the alternative cohorts. The findings are similar to the matched sample results reported in Panel B of Table 5. Up to 5 years after the IPO, dual class firms exhibit a valuation premium over matched single class firms. Then, starting six years after the IPO, dual class firms trade at a discount. Further, the observed dual class discount does not appear to deepen for firms with listing age larger than 9 years. Thus, in sum, the conclusions remain intact when alternative cohort choices are made.

(Insert Table 6 about here)

Our second robustness test employs Total Q as an alternative proxy for firm valuation. Peters and Taylor (2017) introduce Total Q, which scales firm's market value by the sum of physical and intangible capital, whereas the standard proxy for Tobin's Q scales it by the book value of total assets. As explained by Peters and Taylor (2017), Total Q may better capture the firm's assets in place for firms where intangible capital is more important.

The evidence using Total Q is summarized in Panel B of Table 6. In the first five full calendar years after the IPO dual class firms have a statistically significant valuation premium which turns into a discount only 9 years from the IPO. Thus, relative to our benchmark findings, reported in Panel B of Table 5, the Total Q matched sample results somewhat favor dual class firms and suggest that on average dual class structures may not be detrimental even eight years after the IPO.

The third robustness test explores tightening the matching criteria by considering only pairs of single- and dual-class firms that issued within 12 months of each other. An ideal life-cycle experiment would compare single-and dual-class firms that issued on the same month, yet in order to increase the sample size we allow in all our empirical tests (but this robustness test) up to a 24 months difference between single- and dual-class firms' IPO dates. Narrowing the maximum difference between single- and dual-class firms IPO dates to 12 months is thus a step towards the ideal setting (of no difference in IPO dates).[8]

[8] It is noteworthy that in our main matched sample the mean difference between dual- and single-class firms' IPO dates is 0.52 months, very close to zero. This implies that dual-class firms in our matched sample are not systematically older or younger (in terms of years listed on the exchange) than their matched single-class firms. However, the mean absolute difference in listing age in our main matched sample is 11.94 months, and it is cut to 6.14 months in the within 12-months subsample (our robustness test sample).

Cutting the allowed difference in matched firms' IPO dates from 24 months to 12 months decreases sample size by about a half, from 538 pairs to 281 pairs. However, the findings and conclusions remain the same as in our main extended sample. Panel A of Table 7 documents the results of the life-cycle clusters' regressions in the tighter-match subsample. In the first five post-IPO years, dual-class firms yield a 0.24 to 0.36 mean Tobin's Q premium over matched single class firms, and this mean valuation premium is statistically significant at the 10% level. Interestingly, in the 6-8 years' listing-age cohort dual class firms also achieve an higher Tobin's Q than their single-class firm counterparts, and in the 9+ years' cohort the mean Q discount of dual-class firms shrinks to a statistically insignificant -0.07 only. It appears that this robustness test favors dual class firms, indicating that on average dual class structures discount firm value (slightly and insignificantly) only 9 years or more after the IPO.

Last, it is well documented that Tobin's Q depends on the level of control group holdings – see McConnell and Servaes (1990), for example. Thus, it appears appropriate to add control group holdings to our Tobin's Q regressions. We have not used control group holdings as a control variable in our main regressions because ownership data is available only since 1995, which reduces the sample size considerably.

Panel D reports the results of Tobin's Q regressions in the matched sample when controlling shareholders equity stake and its square are added as explanatory variables to the valuation regressions of Table 5 Panel B. The results and conclusions do not change. Dual class firms exhibit a statistically significant valuation premium up to five years after the IPO, and an insignificant valuation discount is observed only 9 years and more after the IPO. Interestingly, much alike most of the above-reviewed robustness tests, the only new indication of this robustness test is that the discount in dual class firm valuation starts later than observed in the main tests. It

appears that our main-analysis conclusions may be a bit conservative or impatient regarding the prudent life-expectancy of dual class structures.

### 5.3. Cross-sectional evidence

We next explore the cross-sectional variation in the life cycle of dual class firm valuation, by comparing the valuation life cycle of dual class firms with a valuation discount (relative to their single class matches) at the time of the IPO to that of dual class firms with a valuation premium. Of the 527 matches examined,[9] there are 243 (46%) pairs of firms where at the IPO year end the dual class firms traded at a discount relative to its single class match.

Table 7 reports Tobin's Q regressions in two subsamples of matched dual and single class firms: matched samples where the dual class firms have a positive initial valuation premium relative to their single class control firm (Panel A), and matched samples where the dual class firms have a negative initial valuation premium, i.e., a valuation discount (Panel B).[10] In Panel A, for the set of dual class firms with an initial valuation premium, we find that this initial valuation premium declines over time and does not turn into a valuation discount as these firms mature. For example, the coefficient of the dual class dummy in the group in the 9+ years' cohort equals 0.061 (t-statistic of 0.47). This indicates that dual class firms with a valuation premium at the end of their IPO year gradually tend to lose this premium over the five years after the IPO year, until their valuations become very similar to those of their single class counterparts.

(Insert Table 7 about here)

[9] For 11 of our 538 matches we miss data for calculating the Q of either the single-class or the dual-class firm.
[10] Results using Total Q are similar and left unreported to save space.

The finding of no discount in the subsample of mature dual class firms with an initial valuation premium is important because it illustrates that either: 1) in some dual class firms agency problems are not more severe than in their matched single class counterparts; or 2) in some dual class firms the unique value of the controlling shareholders persists for a long period and can offset the negative effect of extra agency costs even nine years and more after the IPO. Both these interpretations highlight the importance of the cross-sectional analysis – entrepreneurs' and controlling shareholders' leadership might be needed even ten years after the IPO, and/or at some dual class firms, agency problems may not be significantly higher than at ex-ante comparable single class firms or not substantially increase over time relative to the single class control firms.

We further examine the characteristics of the positive premium dual class firms by running a Probit analysis. Jordan et al. (2016) argue that in general (without referring to firm age) dual class firms with high sales growth and high R&D intensity achieve a valuation premium over similar single class firms. We have introduced pre-IPO differences in sales growth and R&D intensity between dual- and their matched single-class firms as explanatory variables in the Probit analysis of positive dual class premium firms, and found insignificant coefficients. Repeating the analysis with 2-years post IPO sales growth and R&D intensity, we find a positive and statistically significant coefficient of the difference in sales growth. Thus, there is only a slight indication that a dual class firm with a high sales growth (relative to its single class match) would have a positive valuation premium (when compared to this single class match).

Panel B presents the life cycle valuations of dual class firms with an initial valuation discount relative to their single class match. For this set of dual class firms, in all life cycle cohorts (except for the 4 – 5 years cohort), their valuation discount persists. The behavior of initially discounted dual class firms manifests no significant life cycle drift, as the valuation discount for

the 9+ years cohort is only slightly milder than the valuation discount for the 1 – 3 years cohort. The only exception is the 4 – 5 years cohort, for which the valuation difference between the dual class and single class firms in the subsample is positive and insignificant.[11] While it is difficult to interpret these results, they suggest that their agency problems do not aggravate over time.

### 5.4. Time-series variation

Our relatively long sample period, 1980 to 2017, raises questions about possible variations over time in the fundamental phenomenon of the life cycle of dual class firm valuations that we document in this study. To examine such intertemporal variations we divide the sample into two subperiods: 1980-2000 (20th century) and 2001-2017 (21st century). This division is plausible because: 1) it divides the sample roughly into two halves; and 2) in the 21st century, there are fewer IPOs than before - see Gao, Ritter and Zhu (2013). Table 8 describes the decade by decade variation in number of IPOs and in IPO industry composition (high-tech vs. non-high-tech IPOs).

(Insert Table 8 about here)

Table 8 reports that in the 1980s and 1990s the number of IPOs per year was at least double their yearly frequency in the 21st century. The decrease in number of IPOs is accompanied by a steady increase in the weight of high-tech IPOs over time. A second salient phenomenon is the increase in dual class IPOs percentage over time, from 4.24% in the 1980s to about 15.29% in the current decade (years 2011 through 2017). Interestingly, Table 8 documents that the popularity of dual class IPOs within the growing high-tech sector increased by even a larger factor than in the general sample, from 2.29% in the 1980s to 10.82% in the current decade.

[11] We speculate that this peculiar phenomenon may be related to the unification wave in years 3 – 5 after the IPO – see our next subsection. Perhaps the market expected many of these negative premium dual class firms to voluntary unify. For the firms that did not unify their shares, the discount resumes afterwards.

Our main interest is in the intertemporal variation in the life cycle of dual class firm valuations. We repeat our life-cycle regressions of Table 5 in the two subperiods (20th and 21st century), and present the results in Table 9. In general, the life cycle of dual class firm valuations is apparent in both subperiods and in the full and matched samples. This finding highlights the robustness of the life cycle in the relative valuation of dual class versus single class firms.

(Insert Table 9 about here)

Nevertheless, some intertemporal variation in the valuation life cycle appears to exist. In the 21st century the mean early (year 1-3) valuation premium of dual class firms appears to be larger, while the eventual (years 9+) valuation discount appears smaller. When we add an interaction term between the dual class dummy variable and the 21st century dummy variable to our Tobin's Q regressions of Table 5, the coefficients of the interaction term in the 1-3 years' cohort and in the 9+ years' cohort are positive. In the full sample, these positive interaction terms are also statistically significant at the 10% level.

The time-series findings suggest that over time the market has learnt to cope with dual class structures. In the 21st century, firms that choose the dual class structures benefit more than before from its positive early-years aspects. Perhaps there is a better fit between the dual class structures and the firms that elect them in these more recent IPOs. Regarding the smaller eventual (years 9+) valuation discount in the 21st century, we conjecture that it is due to the increased corporate governance standards and increased shareholder activism in the present century.[12]

[12] See Lauterbach and Pajuste (2017) on the effect of media pressure in the context of dual class share unifications.

### 5.5. Dual class share unifications

The decline in the relative valuation of dual versus single class firms documented in Tables 4 through 6 suggests that the dual class structure becomes less efficient as firm matures. Accordingly, a natural solution is dual class share unification, in which all share classes are transformed into "one share one vote", which generally requires approval of the shareholders of the superior-vote-shares.

The availability of a "self-correct" mechanism, namely the possibility that firm controlling shareholders initiate and pass a resolution to unify all share classes, raises the question of whether dual class firms eliminate stale and inefficient dual class structures by themselves. In this section, we examine our Hypothesis 3, that voluntary "self-correcting" firm-initiated dual class unifications are rare and more so when the firm is more mature.

Figure 2 depicts the frequency of unifications by the number of years from the IPO. Unification frequency increases in the first few years after the IPO, reaches a peak at about 3 – 5 years after the IPO, and then decreases. All of these unifications are voluntary firm-initiated unifications, and except for very few cases, controlling shareholders in these firms do not receive any compensation from the firm or other shareholders for giving up their extra voting power. The occurrence of unifications suggests that some firms and controlling shareholders recognize that the dual class structure becomes less efficient over time and decide to opt out.

(Insert Figure 2 about here)

We also estimate the valuation response to unifications. The median change in Tobin's Q in the unification year (from pre-unification year end to unification year-end) is 0.095, and it is statistically significant. In European dual class unifications, Lauterbach and Pajuste (2015)

estimate a Q increase of 0.13 from the pre-unification year-end to the post-unification years end. Evidently, voluntary dual class unifications tend to increase the unifying firm market valuation.

The peak period for unifications is 3 – 5 years after the IPO, which is also the period when the initial valuation premium of dual class firms at the IPO becomes insignificant. Perhaps firms that unify their shares during this period see the vanishing dual class valuation premium, and facing a possible upcoming valuation discount, they decide to eliminate the dual class structure.

However, according to our estimates, only about 20% of dual class firms unify their shares within 9 years after the IPO. Most of the dual class firms elect to retain a dual class structure, perhaps because it is not in the interest of their controlling shareholders to unify. Upon unification, controlling shareholders lose significant voting control and nontrivial amounts of private benefits, and gain in return a fraction (equal to their equity stake) of the market valuation increase. It appears that in most dual class firms, the market valuation increase upon unification does not entice the controlling shareholders to initiate a unification process.

Figure 2 displays a decline in the frequency of unifications starting about five years after the IPO. This dwindling unification rate is consistent with our Hypothesis 3 that is based on Bebchuk and Kastiel (2017), who suggest, as our Table 3 confirms, that controlling shareholders' equity position declines in the years after the IPO. This decline reduces the controlling shareholders' gains from the market value increase upon unification. Hence, unifications become less attractive to controlling shareholders as the firm ages and their equity position declines, which can explain why unifications become even more rare about five years after the IPO.

Table 10 examines the listing age effect on the probability of unifications using Probit regressions that predict unification in the following fiscal year for our matched sample dual class firms during the years 1995-2017. Our set of explanatory variables is based on previous literature,

adding our new variables: Ln Years from IPO (together with its square) in order to capture life cycle effects.

(Insert Table 10 about here)

The Probit analysis results are generally consistent with previous literature. For example, the coefficient of the wedge (the vote minus the equity stake of controlling shareholders) is negative and statistically significant. Upon unification controlling shareholders lose their extra voting power. This extra voting power, approximated by the wedge, represents the cost of unification from the perspective of controlling shareholders. Thus, when the wedge is relatively wide, unifications are more costly to controlling shareholders; and thus their firms are less likely to initiate unifications. Previous studies, such as Maury and Pajuste (2011), also document a negative impact of wedge on the probability of dual class share unification.

Other standard variables in unification analysis are industry growth opportunities and pending seasoned equity offers. Firms that plan seasoned equity offers or are growing rapidly and need frequent access to market financing suffer from the price discount of the low-voting-shares. For such firms, the dual class structure may be relatively inefficient, such that they are more likely to unify their share classes.[13] Consistent with this hypothesis and with findings in previous literature, Table 10 shows that better growth opportunities and pending equity offerings are strongly positively associated with the probability of unifications.

However, our main interest is in the life cycle effects, represented by the variable capturing the log of number of years from the IPO. Using only this variable in column 1 of Table 10, we find a negative association between the number of years since the IPO and the likelihood to unify.

[13] Abolishing the dual class structure ahead of an equity offering also helps create a public relations hype that generates relatively high share prices ahead of the offering – see Lauterbach and Pajuste (2015).

Using the square of the log number of years as well in columns 2 and 3, we find a non-linear association, where the coefficient of the log number of years from the IPO is positive and the coefficient of its square is negative (and statistically significant). The fitted parabolic relation is consistent with Hypothesis 3. After a wave of self-correcting unifications in the first five post-IPO years, the unification tendency wanes, and some stale inefficient dual class structure persist.

A final comment regards the variable used for best capturing the controlling shareholders' reluctance to opt out of the dual class structure and unify the share classes. Bebchuk and Kastiel (2017) propose that the overall equity holdings of controlling shareholders are the key variable, which we use in column 3 of Table 10, as an alternative to the wedge used in columns 1 and 2. The coefficient of equity holdings is negative, as expected, yet it is statistically insignificant. Thus, the wedge between the controlling shareholders' vote and equity proportion in the firm, appears more relevant for abolishing the dual class structure, perhaps because it represents more precisely the costs of unifications to controlling shareholders.

The apparent failure of most dual class firms to self-correct raises the question of the need for external regulatory intervention. The regulatory dilemma is discussed next.

## 6. Regulatory Implications and Discussion

The opposition to dual class financing is based on both popular and academic arguments.[14] Popular views seem to object to the inequality between shareholders of superior-voting and inferior-voting shares. It is widely contended that dual class firms want public investors' money but not their "voice". Academic scholars treat the problem as an agency problem. With their

[14] As an example, see new SEC Commissioner Jackson speech, in which he said that "Asking investors to put eternal trust in corporate royalty is antithetical to our values as Americans" (https://www.sec.gov/news/speech/perpetual-dual-class-stock-case-against-corporate-royalty).

commanding voting power, controlling shareholders may extract various private benefits from the firm at the cost of more efficient use of corporate resources.

Proponents of dual class firms reply that the founders' vision, leadership and skills are crucial for firm's continued success, and that in situations where outside shareholders are less informed and the firm requires specific investments (such as in firms engaged in long-term innovation or requiring the entrepreneur to invest significant firm-specific human capital), it is more efficient to let insiders make decisions at a greater distance from shareholder interference. Thus, the added value of a structure that isolates founders from "market discipline" offsets the increased agency problem costs from the 'extreme' limits on outside shareholder rights that dual class structures represent. Furthermore, to the extent that the agency costs of the dual class structure can be assessed in advance, the price the public pays for the inferior-vote shares is "fair".

To this debate, we add our life cycle observations. According to our evidence, dual class structures tend to have a valuation premium at the IPO and in first few years following it. On average, firms electing a dual class structure achieve a higher market value in their early years as public firms relative to young firms with single class financing that had their public offering at the same time, in the same industry, with similar asset size and profitability. As discussed previously, one interpretation is that dual class structures are more efficient for a subset of young firms. An alternative interpretation is that, notwithstanding our matched sample construction, dual class firms tend to have better growth opportunities in their early life as publicly traded firms. However, even under the second interpretation, the controlling shareholders have revealed a preference for a dual class structure for these young firms with strong growth opportunities. Accordingly, it seems plausible that without the control afforded by the dual class structure, some firm founders would

not issue shares to the public, such that their firms would not have been able to expand as quickly. In sum, our evidence strongly supports allowing dual class IPOs.

We also find that the initial dual class valuation premium is temporary, and on average it disappears within 6 to 9 years after the IPO, depending on the methodology and proxies used. The declining valuations of dual- versus single-class firms and the eventual average valuation discount may provide tentative support for an age-based mandatory sunset provision for dual class structures, as advocated by Bebchuk and Kastiel (2017). Such a provision would mandate a shareholder vote at a certain listing age on whether the dual class structure should be abolished, which could potentially eliminate inefficient dual-class structures among mature firms. Noticeably, we find that dual class firms with an initial valuation discount (relative to comparable single-class firm at the IPO year-end) tend to maintain this valuation discount even as mature firms. A mandatory sunset provision may revitalize these firms in particular.

Recent empirical work by SEC Commissioner Jackson (2018) and his staff compares dual class firm IPOs with and without sunset provisions. The sample comprises 157 U.S. dual class IPOs in 2001-2016, 71 (45%) of which have a sunset provision. Using a similar methodology to ours, they find that starting three years after the IPO, perpetual dual class firms (without any sunset clause) are discounted (have lower Tobin's Q) relative to dual class firms with a sunset provision. This evidence may provide further support for any sunset regulation.

The prospective sunset provision, as any regulation, may have some negative consequences. First, some founders may be reluctant to issue publicly traded shares if their reign over the firm is likely to be more limited in time. Second, controlling shareholders may intensify their private benefits extraction in the period before their extra power expires, which might also divert their attention from firm's genuine goals. Third, it is possible that shareholders may elect to

abolish dual class structures even when they are beneficial. Last, we find evidence that in the second half of our sample period, the 21st century, the eventual mean discount of dual class firms is lower than in previous years. Thus, it is likely than recent years increased corporate governance standards and public and media attention, mitigated the agency problem of dual class firms making additional regulation unnecessary or of little value.

Regarding the timing of any sunset provision, our study suggest to wait at least six years after the IPO. Interestingly, the Council of Institutional Investors' (2018) "Summary of Key Academic Literature on Multi-Class Structures and Firm Value" notes (on page 2) that our results support a time-based sunset of 6 to 9 years, explaining that this time frame includes "*the common 7 years sunset"* (italics added by us). It appears that the market itself has set a standard for the timing of a sunset provision that is consistent with our results.

Another phenomena that we document is that the wedge between controlling shareholders voting and equity rights widens in the years after the IPO. The widening of the wedge is typically associated with more severe agency problems – see Masulis et al. (2009). Bebchuk and Kastiel (2018) analyze the perils of the widening wedges and advocate informing the public about the wedge and capping it. A sunset provision might resolve these kind of problems as well.

Finally, it is important to note that our results are also relevant for the broader universe of all antitakeover defenses. Dual class structures may be viewed as an extreme form of anti-takeover defense. Johnson, Karpoff and Yi (2018) find that anti-takeover defenses contribute positively to firm market value in the first years after the IPO, and only later on begin to be negatively associated with firm value. The implication is that sunset provisions could be debated for other takeover defenses as well.

## 7. Summary and Conclusions

We employ an extensive dataset of single- and dual-class U.S. firms in the 1980-2017 period to examine life cycle effects in dual class firms. We find that dual class firms exhibit a valuation premium over comparable single class firms at the IPO, which is maintained for 6 to 9 years afterwards. In our sample, mature (older than eight years) dual class firms tend to have lower valuations compared to single class firms. Interestingly, this mature-age valuation discount does not spur most dual class firms to abolish the dual class structure and unify all share classes (i.e. convert all shares to "one share one vote"). Stale dual class structures that seem to depress market valuations persist, perhaps because they serve well their controlling shareholders' interests. Empirically, we find that the wedge between the voting and equity stakes of the controlling shareholders tends to increase as the firm ages, which can help explain the controlling shareholders' reluctance to unify.

Cross sectional tests reveal that on average dual class firms with an initial valuation premium relative to their matched single class firms gradually lose this premium, but do not develop a valuation discount. In contrast, dual class firms with an initial valuation discount do not recover on average, i.e., maintain their discount in the long-run. Our time-series investigation finds larger initial premiums and lower eventual dual class firms discounts in the later part of our sample period (the 21$^{st}$ century). This may indicate that the market is learning to cope with dual class firms pros and cons on its own.

Our findings can nourish and inform the debate regarding dual class stock financing, including the proposal in Bebchuk and Kastiel (2017) to adopt an age-based sunset provision for dual class structures. The proposed sunset clause would allow public shareholders to eliminate the dual class structure (i.e., force unification of all share classes) a pre-specified number of years after

the IPO. Our empirical evidence illustrates that, on average, public shareholders with an inferior vote may benefit from or not be harmed by a dual class structure in at least the first five years after the IPO. Thus, given other considerations as well, a typical sunset provision should not set in until at least six years after the IPO.

## References


Adams, R., Ferreira, D., 2008. One-share one-vote: The empirical evidence. Review of Finance 12(1), 51-91.

Alchian, A., Demsetz, H., 1972. Production, information costs, and economic organization. American Economic Review 62(5), 777-795.

Baran, L., Forst, A. Via, M.T., 2018. Dual class share structure and innovation (September 4, 2018). Available at SSRN: https://ssrn.com/abstract=3183517.

Bebchuk, L.A., 2003. Why firms adopt antitakeover arrangements, University of Pennsylvania Law Review 152, 713-753.

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

Bebchuk, L.A., Kastiel, K., 2018. The perils of small-minority controllers. Georgetown Law Journal (forthcoming).

Bennedsen, M., Nielsen, K., 2010. Incentive and entrenchment effects in European ownership. Journal of Banking and Finance 34, 2212-2229.

Burkart, M., Lee, S., 2008. One-share one-vote: The theory. Review of Finance 12(1), 1-49.

Council of Institutional Investors, 2018. CII Summaries of Key Academic Literature on Multi-Class Structures and Firm Value.

Cremers, K.J.M., Litov, L., Sepe, S., 2017. Staggered boards and long-term firm value, revisited. Journal of Financial Economics 126, 422-444.

DeAngelo, H., DeAngelo, L., 1985. Managerial ownership of voting rights. Journal of Financial Economics 14, 33–69.

Fama, E., French. K., 1997. Industry costs of equity. Journal of Financial Economics 43, 153–94.

Gao, X., Ritter, J., Zhu, Z., 2013. Where have all the IPOs gone? Journal of Financial and Quantitative Analysis 48(6), 1663-1692.

Gompers, P.A., Ishii, J.L., Metrick, A., 2010. Extreme governance: An analysis of dual-class companies in the United States. Review of Financial Studies 23, 1051-1088.

Howell, J.W., 2017. The survival of the U.S. dual class share structure. Journal of Corporate Finance 44, 440-450.

Jackson, R., 2018. Case against corporate royalty - data appendix. Available at: www.sec.gov/files/case-against-corporate-royalty-data-appendix.pdf

Johnson, W.C., Karpoff, J.M., Yi, S., 2018. The lifecycle effects of firm takeover defenses. Working Paper, The University of Washington.

Jordan, B., Kim, S., Liu, M., 2016. Growth opportunities, short term market pressure, and dual-class share structure. Journal of Corporate Finance 41, 304-328.

Kile, C.O., Phillips, M.I., 2009. Using industry classification codes to sample high-technology firms: Analysis and recommendations. Journal of Accounting, Auditing and Finance 24, 35-58.

Kim, H., Michaely, R., 2018. Sticking around too long? Dynamics of the benefits of dual class structures. Working paper, Cornell University.

Laffont, J., Tirole, J., 1988. Repeated auctions of incentive contracts, investment and bidding parity, with an application to takeovers. RAND Journal of Economics 19, 516–537.

Lauterbach, B., Pajuste, A., 2015. The long-term valuation effects of voluntary dual class share unifications. Journal of Corporate Finance 31, 171-185.

Lauterbach, B., Pajuste, A., 2017. The media and firm reputation role in corporate governance improvements: Lessons from European dual class share unifications. Corporate Governance: An International Review 25(1), 4-19.

Lehn, K., Netter, J., Poulsen, A., 1990. Consolidating corporate control: Dual-class recapitalizations versus leveraged buyouts. Journal of Financial Economics 27, 557–580.

Loderer, C., Stulz, R., Waelchli, U., 2017. Firm rigidities and the decline in growth opportunities. Management Science 63(9), 3000–3020.

Masulis, R., Wang, C., Xie, F., 2009. Agency problems and dual-class companies. Journal of Finance 64(4), 1697-1727.

Matthews, G., 2016. Valuation of shares of companies with a dual class structure. Presentation at the ASA Advanced Business Valuation Conference (September 14, 2016).

Maury, B., Pajuste, A., 2011. Private benefits of control and dual-class share unifications. Managerial and Decision Economics 32, 355-369.

McConnell, J., Servaes, H., 1990. Additional evidence on equity ownership and corporate value. Journal of Financial Economics 27, 595-612.

Peters, R.H., Taylor, L.A., 2017. Intangible capital and the investment- q relation. Journal of Financial Economics 123, 251–272.

Ritter, J., 1991. The long-run performance of initial public offerings. Journal of Finance 46, 3-27.

Ritter, J., 2018. A list of IPOs from 1980-2017 with multiple share classes outstanding. Available on https://site.warrington.ufl.edu/ritter/ipo-data/.

Shleifer, A., Summers, L., 1988. Breach of trust in hostile takeovers. In: Auerbach, A.J. (Ed.), Corporate Takeovers: Causes and Consequences. University of Chicago Press, Chicago, IL, 33–68.

Smart, S., Thirumalai, R., Zutter, C., 2008. What's in a vote? The short- and long-run impact of dual-class equity on IPO firm values. Journal of Accounting and Economics 45, 94-115.

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

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

Stein, J.C., 1989. Efficient capital markets, inefficient firms: A model of myopic corporate behavior. Quarterly Journal of Economics 104, 655-669.

Villalonga, B., Amit, R., 2006. How do family ownership, control and management affect firm value? Journal of Financial Economics 80, 385-417.

## Appendix A. Variable definitions

| | |
|---|---|
| Age | Defined as the fiscal year minus the year of founding. The founding year data are from Ritter (2018) https://site.warrington.ufl.edu/ritter/ipo-data/ |
| $Assets_t$ | Total Assets measured in millions of dollars at the end of fiscal year *t*. Source: Compustat (item AT). |
| Capital $Expenditures_t$ | The ratio of capital expenditures (CAPX) in year *t* to total assets (AT) at the end of *t*. Source: Compustat. |
| Cash $Balance_t$ | The ratio of cash and short-term investments (CHE) to total assets (AT) at the end of fiscal year *t*. Source: Compustat. |
| Control $rights_t$ | The fraction of voting rights held by the insiders. (See also Ownership rights.) |
| Ownership $rights_t$ | The fraction of cash flow rights held by the insiders. The control rights and ownership rights are calculated from the share holdings of insiders on the record date closest to the end of fiscal year *t*. For years 1995-2002, we use the dataset kindly provided by Andrew Metrick. For later years we follow GIM methodology, and calculate the aggregate holdings (owned either directly or through beneficiaries) of all executive officers and directors. Source: GIM (2010) and SEC disclosures (proxy statements or 10-Ks). |
| Control minus $Ownership_t$ | The control rights minus the ownership rights held be the insiders. (See also Ownership rights.) |
| Equity Issue $Dummy_t$ | Equals one if the company had sales of common or preferred stock (SSTK) greater than zero in year *t*; otherwise the variable is equal to zero. Source: Compustat. |
| Growth $opportunities_t$ | The median Tobin's Q ratio of single-class firms in the respective 48 Fama and French (1997) industry group. |
| Industry-adj. | The variable is industry-adjusted, which is done by subtracting the industry median based on the 48 Fama and French (1997) industry groups. |
| Industry Dummies | Dummy variables for 48 Fama and French (1997) industry groups. |
| $Leverage_t$ | The ratio of long-term debt (DLTT) to total assets (AT) at the end of fiscal year *t*. Source: Compustat. |
| Ln Years from IPO | Natural logarithm of the number of years from IPO. Years from IPO are calculated from monthly data, i.e. 6-17 months are rounded to 1 year from IPO, 18-29 months—to 2 years from IPO, etc. |
| Media Dummy | Media industries are defined as SIC Codes 2710-11, 2720-21, 2730-31, 4830, 4832-33, 4840-41, 7810, 7812, and 7820. Source: Compustat. |
| $PPE_t$ | The ratio of property, plant, and equipment (PPE) to total assets (AT) at the end of fiscal year *t*. Source: Compustat. |
| Research and $Development_t$ | The ratio of research and development expense (XRD) in year *t* to total assets (AT) at the end of *t*. The variable is set to zero when research and development expense is missing. Source: Compustat. |
| $ROA_t$ | Return on assets; net income (NI) in year *t* to total assets (AT) at the end of fiscal year *t*. Source: Compustat. |
| $ROE_t$ | Return on equity; net income (NI) in year *t* to book value of common stock (CEQ) at the end of fiscal year *t*. Source: Compustat. |
| Sales $Growth_t$ | Percentage change in revenues (REVT) from year *t-1* to year *t*. Source: Compustat. |
| Size | Natural logarithm of assets (in MUSD). |
| Tobin's $Q_t$ | The ratio of the book value of assets (AT) plus the market value of common stock (=number of shares outstanding (CSHO) times share price (PRCC-F)) less the book value of common stock (CEQ) and deferred taxes (TXDB) to book value of assets (AT). When assessing the market value of dual class firms, we follow Villalonga and Amit (2006), and assume that the market value of any non-trading high-vote share is equal to the price of the trading low vote share. All figures come from the end of fiscal year *t*. Source: Compustat. |
| Total $Q_t$ | The total q measure as defined by Peters and Taylor (2017). Total q is measured by scaling firm value by the sum of physical and intangible capital. The firm's market value (the numerator) is measured by the market value of common stock (=number of shares outstanding (CSHO) times share price (PRCC-F)), plus the book value of debt (DLTT + DLC), minus the firm's current assets (ACT). The denominator is the replacement cost of physical capital, i.e. the book value of property, plant, and equipment (PPEGT), plus the replacement cost of intangible capital. The replacement cost of intangible capital is the externally purchased intangible capital (INTAN), plus the internally created intangible capital consisting of the knowledge capital (the capitalized R&D expense) and the organizational capital (the capitalized 30% of SG&A expenses). |

Appendix B: Survival of single- and dual-class firms

Table B1. Survival differences between dual- and single-class firms: Cumulative dropouts' analysis

Panel A reports the total number of dropouts for a matched sample of dual- and single-class firms in years relative to the IPO. Dropouts (or delistings) are firms that do not survive as stand-alone entities on CRSP. In panels B, C and D, we break out three different reasons for non-survival, based on the delisting codes on CRSP. Panel B reports the number of mergers, Panel C—the number of delistings due to distress, and Panel D—the number of delistings due to other reasons. In this table we use a matched sample of 450 dual and 450 single-class firms that had an IPO in the year 2008 or earlier, i.e. firms that could have lived for 9 years (by the end of 2017) after the IPO. Firms are matched in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA.

Panel A. Cumulative number of total dropouts

| | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | IPO+9 |
|---|---|---|---|---|---|---|---|---|---|
| Dual class firms (N) | 8 | 38 | 78 | 110 | 135 | 154 | 173 | 194 | 211 |
| Single class firms (N) | 23 | 66 | 115 | 154 | 180 | 211 | 229 | 246 | 268 |
| Dual class firms (% of total) | 1.8% | 8.4% | 17.3% | 24.4% | 30.0% | 34.2% | 38.4% | 43.1% | 46.9% |
| Single class firms (% of total) | 5.1% | 14.7% | 25.6% | 34.2% | 40.0% | 46.9% | 50.9% | 54.7% | 59.6% |
| *p-value of difference* | *0.006* | *0.003* | *0.003* | *0.001* | *0.002* | *0.000* | *0.000* | *0.001* | *0.000* |

Panel B: Cumulative number of mergers

| | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | IPO+9 |
|---|---|---|---|---|---|---|---|---|---|
| Dual class firms (N) | 7 | 25 | 46 | 64 | 77 | 86 | 99 | 113 | 121 |
| Single class firms (N) | 15 | 42 | 73 | 97 | 116 | 132 | 143 | 149 | 162 |
| Dual class firms (% of total) | 1.6% | 5.6% | 10.2% | 14.2% | 17.1% | 19.1% | 22.0% | 25.1% | 26.9% |
| Single class firms (% of total) | 3.3% | 9.3% | 16.2% | 21.6% | 25.8% | 29.3% | 31.8% | 33.1% | 36.0% |
| *p-value of difference* | *0.084* | *0.031* | *0.008* | *0.004* | *0.002* | *0.000* | *0.001* | *0.008* | *0.003* |

Panel C. Cumulative number of delistings due to distress

| | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | IPO+9 |
|---|---|---|---|---|---|---|---|---|---|
| Dual class firms (N) | 0 | 3 | 7 | 10 | 16 | 23 | 25 | 29 | 30 |
| Single class firms (N) | 4 | 14 | 25 | 31 | 36 | 44 | 48 | 53 | 57 |
| Dual class firms (% of total) | 0.0% | 0.7% | 1.6% | 2.2% | 3.6% | 5.1% | 5.6% | 6.4% | 6.7% |
| Single class firms (% of total) | 0.9% | 3.1% | 5.6% | 6.9% | 8.0% | 9.8% | 10.7% | 11.8% | 12.7% |
| *p-value of difference* | *0.045* | *0.007* | *0.001* | *0.001* | *0.004* | *0.008* | *0.005* | *0.005* | *0.002* |

Panel D. Cumulative number of other dropouts, typically, non-compliance with listing rules

| | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | IPO+9 |
|---|---|---|---|---|---|---|---|---|---|
| Dual class firms (N) | 1 | 10 | 25 | 36 | 42 | 45 | 49 | 52 | 60 |
| Single class firms (N) | 4 | 10 | 17 | 26 | 28 | 35 | 38 | 44 | 49 |
| Dual class firms (% of total) | 0.2% | 2.2% | 5.6% | 8.0% | 9.3% | 10.0% | 10.9% | 11.6% | 13.3% |
| Single class firms (% of total) | 0.9% | 2.2% | 3.8% | 5.8% | 6.2% | 7.8% | 8.4% | 9.8% | 10.9% |
| *p-value of difference* | *0.179* | *1.000* | *0.207* | *0.189* | *0.082* | *0.242* | *0.215* | *0.440* | *0.338* |

Table 1. Differences between dual- and single-class firms: Snapshots 1985-2015

The table presents medians of several financial variables for dual- and single-class firms in different calendar years. For one variable—Research and Development—means are reported instead of medians because the medians equal zero. The full sample of dual- and single- class firms is used over the period 1985-2015. *Assets* is total assets measured in millions of dollars. *Capital Expenditures* is the ratio of capital expenditures to total assets. *Leverage* is the ratio of book value of long-term debt to total assets. *Research and Development* is the ratio of research and development expenditures to total assets. *Return on Assets* is the ratio of net income to total assets. *Return on Equity* is the ratio of net income in year *t* to book value of common stock at the end of year *t. Sales growth is* a percentage change in revenues from year *t-1* to year *t*. *Tobin's Q* is measured as the market-to-book ratio of the firm. Equality of medians is tested using the Pearson's chi-squared test (and equality of means—using the two-sided t-test).

| | 1985 | 1991 | 1997 | 2003 | 2009 | 2015 |
|---|---|---|---|---|---|---|
| **Assets (Millions)** | | | | | | |
| Dual Class | 67.5 | 169.4 | 238.6 | 784.7 | 846.7 | 1490.9 |
| Single Class | 27.7 | 44.1 | 63.8 | 143.1 | 276.7 | 409.2 |
| *p-value of Median equality test* | *0.005* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| **Capital Expenditures** | | | | | | |
| Dual Class | 7.36% | 4.96% | 4.73% | 3.11% | 2.07% | 3.05% |
| Single Class | 6.93% | 4.09% | 4.77% | 2.33% | 1.99% | 2.30% |
| *p-value of Median equality test* | *0.726* | *0.344* | *0.901* | *0.002* | *0.490* | *0.015* |
| **Leverage** | | | | | | |
| Dual Class | 13.9% | 24.2% | 22.5% | 19.6% | 15.1% | 18.8% |
| Single Class | 7.2% | 5.7% | 4.9% | 3.9% | 3.3% | 12.5% |
| *p-value of Median equality test* | *0.036* | *0.000* | *0.000* | *0.000* | *0.000* | *0.061* |
| **Research and Development (means)** | | | | | | |
| Dual Class | 3.05% | 2.80% | 3.07% | 2.57% | 3.11% | 3.12% |
| Single Class | 5.93% | 6.34% | 8.83% | 8.53% | 9.16% | 10.25% |
| *p-value of Mean equality test* | *0.141* | *0.002* | *0.000* | *0.000* | *0.000* | *0.000* |
| **Return on Assets** | | | | | | |
| Dual Class | 6.21% | 3.05% | 2.76% | 2.04% | 1.66% | 2.60% |
| Single Class | 3.04% | 2.47% | 1.49% | 0.91% | 0.84% | 0.03% |
| *p-value of Median equality test* | *0.002* | *0.403* | *0.023* | *0.062* | *0.024* | *0.000* |
| **Return on Equity** | | | | | | |
| Dual Class | 14.2% | 8.2% | 6.9% | 6.8% | 6.2% | 7.8% |
| Single Class | 6.4% | 6.1% | 4.0% | 2.3% | 2.0% | 0.5% |
| *p-value of Median equality test* | *0.000* | *0.080* | *0.010* | *0.010* | *0.003* | *0.000* |
| **Sales growth** | | | | | | |
| Dual Class | 21.0% | 9.5% | 21.4% | 5.8% | -7.3% | 6.3% |
| Single Class | 20.1% | 11.0% | 20.7% | 8.7% | -4.6% | 5.2% |
| *p-value of Median equality test* | *1.000* | *0.752* | *0.711* | *0.032* | *0.263* | *0.865* |
| **Tobin's Q** | | | | | | |
| Dual Class | 1.60 | 1.43 | 1.61 | 1.37 | 1.27 | 1.54 |
| Single Class | 1.67 | 1.57 | 1.87 | 1.87 | 1.51 | 1.71 |
| *p-value of Median equality test* | *0.484* | *0.344* | *0.000* | *0.000* | *0.000* | *0.035* |
| **Number of Observations (median across the above descriptive variables; actual is within 5% of the median)** | | | | | | |
| Dual Class | 34 | 97 | 290 | 214 | 146 | 168 |
| Single Class | 835 | 1345 | 3142 | 2191 | 1668 | 1567 |

Table 2. Key statistics of single and dual-class firms at the IPO

The table presents medians of several financial variables for dual- and single-class firms at the fiscal year-end following the IPO. For one variable—Research and Development—means are reported instead of medians because the medians equal zero. Both the full and matched samples of dual- and single-class firms are used over the period 1980-2017. The matched sample includes 538 dual- and 538 single-class firms that are matched in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA. *Age* is defined as the fiscal year minus the year of founding. *Assets* is total assets measured in millions of dollars. *Capital Expenditures* is the ratio of capital expenditures to total assets. *Leverage* is the ratio of book value of long-term debt to total assets. *Research and Development* is the ratio of research and development expenditures to total assets. *Return on Assets* is the ratio of net income to total assets. Return on Equity is the ratio of net income in year *t* to book value of common stock at the end of year *t*. *Sales growth is* a percentage change in revenues from year *t-1* to year *t*. Equality of medians is tested using the Pearson's chi-squared test (and equality of means—using the two-sided t-test).

| | Full sample | | | Matched sample | | |
|---|---|---|---|---|---|---|
| | Single Class | Dual Class | *p-value of Difference* | Single Class | Dual Class | *p-value of Difference* |
| Age | 7 | 11 | *0.000* | 10 | 10 | *0.597* |
| Assets (Millions) | 49.0 | 205.4 | *0.000* | 143.8 | 165.3 | *0.292* |
| Capital Expenditures | 4.60% | 4.47% | *0.563* | 4.57% | 4.47% | *0.926* |
| Leverage | 2.28% | 10.73% | *0.000* | 9.59% | 8.67% | *0.760* |
| Research and Development (means) | 7.19% | 3.86% | *0.000* | 3.75% | 4.31% | *0.358* |
| Return on Assets | 1.75% | 2.06% | *0.538* | 1.78% | 1.99% | *0.903* |
| Return on Equity | 3.48% | 4.86% | *0.184* | 4.39% | 4.43% | *0.975* |
| Sales growth | 39.76% | 31.65% | *0.001* | 33.01% | 34.08% | *0.922* |
| IPO size (% of total post-IPO shares) | 28.96 | 30.20 | *0.221* | 28.16 | 30.88 | *0.075* |

Table 3. The change in controlling shareholders holdings along dual class firm's life cycle

*Controlling shareholders' equity share* is the fraction of cash flow rights held by the controlling shareholders. *Controlling shareholders' vote* is the fraction of voting rights held by the controlling shareholders. *Vote minus equity (wedge)* is the difference between controlling shareholders voting and equity rights. Panels A and B present the mean controlling shareholders' equity and the mean wedge for dual-class firms in years relative to the IPO. In Panel A, we report data for all dual-class firms with available ownership data (for the period 1995-2017); a firm is dropped from the sample after the unification. In Panel B, we report data for a balanced panel of dual-class firms with complete ownership data that preserved the dual-class structure for at least 5 years. Matching is done according to the IPO year, industry, firm size, and ROA.

| | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | IPO+9 | IPO+1 vs. IPO+5 (p-value) |
|---|---|---|---|---|---|---|---|---|---|---|
| Panel A. Dual-class firms | | | | | | | | | | |
| Controlling shareholders' equity share, % | 49.93 | 45.25 | 41.48 | 40.02 | 37.13 | 36.98 | 37.49 | 38.37 | 38.12 | *0.000* |
| Vote minus equity (wedge), % | 16.22 | 17.38 | 19.81 | 20.97 | 22.01 | 22.40 | 23.68 | 24.91 | 26.38 | *0.005* |
| Number of observations | 358 | 326 | 281 | 243 | 208 | 196 | 172 | 163 | 151 | |
| Panel B. Dual-class firms with complete ownership data that survived at least 5 years | | | | | | | | | | |
| Insider ownership rights, % | 53.24 | 48.79 | 43.89 | 39.92 | 38.11 | | | | | *0.000* |
| Control minus Ownership (wedge), % | 19.33 | 21.20 | 22.75 | 22.61 | 22.53 | | | | | *0.002* |
| Number of observations | 149 | 149 | 149 | 149 | 149 | | | | | |

Table 4. The relative valuation of dual- and single-class firms and its change along the life cycle (Tobin's Q analysis)

Tobin's Q is the ratio of the book value of assets plus the market value of common stocks less the book value of common stocks and deferred taxes to book value of assets. Panel A shows Tobin's Q in years relative to the IPO for the full sample of dual- and single-class firms. Panel B shows Tobin's Q in years relative to the IPO for the matched sample of 538 dual- and 538 single-class firms that are matched in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA. 'IPO' denotes the fiscal year end following the IPO. 'IPO+1' denotes the fiscal year end one year after the IPO, and so on. Equality of means is tested using the two-sided t-test.

Panel A: Full sample

| Variable | IPO | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | 9+ (average) |
|---|---|---|---|---|---|---|---|---|---|---|
| Dual Tobin's Q (mean) | 3.00 | 2.44 | 2.22 | 2.01 | 1.90 | 1.82 | 1.65 | 1.63 | 1.69 | 1.70 |
| Single Tobin's Q (mean) | 3.21 | 2.59 | 2.42 | 2.41 | 2.33 | 2.26 | 2.26 | 2.23 | 2.22 | 2.11 |
| Dual class premium (in terms of Tobin's Q) | -0.21 | -0.14 | -0.20 | -0.40 | -0.42 | -0.44 | -0.60 | -0.60 | -0.52 | -0.41 |
| *p-value of difference* | *0.056* | *0.130* | *0.044* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |

Panel B: Matched sample

| Variable | IPO | IPO+1 | IPO+2 | IPO+3 | IPO+4 | IPO+5 | IPO+6 | IPO+7 | IPO+8 | 9+ (average) |
|---|---|---|---|---|---|---|---|---|---|---|
| Dual Tobin's Q (mean) | 3.12 | 2.51 | 2.28 | 2.03 | 1.90 | 1.82 | 1.64 | 1.61 | 1.69 | 1.68 |
| Single Tobin's Q (mean) | 2.76 | 2.34 | 2.16 | 1.99 | 1.90 | 1.83 | 1.95 | 1.94 | 2.05 | 1.86 |
| Dual class premium (in terms of Tobin's Q) | 0.36 | 0.17 | 0.12 | 0.04 | 0.00 | -0.01 | -0.31 | -0.33 | -0.36 | -0.18 |
| *p-value of difference* | *0.017* | *0.199* | *0.355* | *0.742* | *0.982* | *0.937* | *0.030* | *0.027* | *0.039* | *0.165* |

Table 5. Tobin's Q analysis of dual class firms' valuation premium by firms' listing age

The table reports the results of OLS regressions from different year-clusters relative to the IPO, where the dependent variable is Tobin's Q. *Tobin's Q* is measured as the market-to-book ratio of the firm. Panel A (B) reports the results in the full (matched) sample of single and dual class firms. The matched sample of dual- and single-class firms is used over the period 1980-2017; matching is done in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA. *Dual dummy* equals one if the company has a dual-class share structure at the respective fiscal year-end, otherwise the variable is equal to zero. *Size* is the natural logarithm of total assets (in MUSD). *ROA* is return on assets, measured as the ratio of net income to total assets. *Capital Expenditures* is the ratio of capital expenditures to total assets. *Research and Development* is the ratio of research and development expenditures to total assets. *PPE* is the ratio of property, plant and equipment to total assets. *Cash balance* is the ratio of cash and short-term investments to total assets *Leverage* is the ratio of book value of long-term debt to total assets. The first column reports the results from all the firm-years, column (2)—from 1-3 years relative to the IPO, etc. All specifications include year and 48 Fama-French industry groups fixed effects. T-statistics are based on robust standard errors clustered at the firm level and are given in parentheses. ***, **, and * refers to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Full sample

| | | Years relative to the IPO | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | 0.004 | 0.24*** | 0.068 | -0.16** | -0.22*** |
| | (0.08) | (3.58) | (0.82) | (-2.30) | (-2.90) |
| Size | -0.041*** | -0.092*** | -0.077*** | -0.079*** | 0.017 |
| | (-3.42) | (-5.61) | (-3.76) | (-3.74) | (0.98) |
| ROA | -0.38*** | -0.29*** | -0.61*** | -0.50*** | -0.21 |
| | (-5.68) | (-3.59) | (-4.67) | (-3.36) | (-1.28) |
| Capital Expenditures | 0.042*** | 0.029*** | 0.041*** | 0.047*** | 0.059*** |
| | (20.46) | (11.69) | (9.68) | (9.26) | (11.08) |
| Research and Development | 0.027*** | 0.025*** | 0.021*** | 0.025*** | 0.038*** |
| | (12.60) | (9.99) | (5.58) | (5.52) | (8.91) |
| PPE | -0.95*** | -0.66*** | -0.90*** | -0.79*** | -1.17*** |
| | (-10.73) | (-5.72) | (-5.84) | (-4.56) | (-7.59) |
| Cash Balance | 0.018*** | 0.015*** | 0.020*** | 0.015*** | 0.014*** |
| | (22.12) | (12.59) | (11.20) | (7.66) | (8.70) |
| Leverage | 0.21** | -0.17 | 0.10 | 0.39** | 0.50*** |
| | (2.21) | (-1.47) | (0.65) | (2.40) | (3.13) |
| Constant | 1.77*** | 2.11*** | 1.84*** | 1.85*** | 1.34*** |
| | (27.04) | (23.74) | (15.95) | (15.70) | (12.39) |
| Industry-Year effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 68,681 | 19,000 | 8,862 | 9,859 | 23,267 |
| Adjusted R-squared | 0.266 | 0.233 | 0.252 | 0.241 | 0.281 |

Panel B. Matched sample

| | | Years relative to the IPO | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | -0.012 | 0.22** | 0.21 | -0.15 | -0.17* |
| | (-0.18) | (2.08) | (1.60) | (-1.18) | (-1.67) |
| Size | -0.044 | -0.066 | -0.012 | -0.066 | -0.010 |
| | (-1.54) | (-1.27) | (-0.24) | (-0.90) | (-0.25) |
| ROA | 0.33* | 0.59** | 0.43 | -0.005 | 0.30 |
| | (1.76) | (2.39) | (1.14) | (-0.006) | (0.84) |
| Capital Expenditures | 0.037*** | 0.020*** | 0.024* | 0.030*** | 0.039*** |
| | (6.44) | (2.89) | (1.90) | (3.00) | (3.97) |
| Research and Development | 0.053*** | 0.035*** | 0.028* | 0.051 | 0.075*** |
| | (5.08) | (3.31) | (1.69) | (1.65) | (4.71) |
| PPE | -0.67*** | -0.16 | -0.12 | -0.47 | -0.84*** |
| | (-3.05) | (-0.50) | (-0.38) | (-1.58) | (-2.81) |
| Cash Balance | 0.024*** | 0.029*** | 0.022*** | 0.022** | 0.015*** |
| | (9.28) | (5.87) | (4.24) | (2.23) | (4.21) |
| Leverage | 0.52* | -0.18 | 0.003 | 0.90* | 1.14*** |
| | (1.92) | (-0.62) | (0.009) | (1.85) | (2.77) |
| Constant | 1.51*** | 1.77*** | 1.25*** | 1.49*** | 1.23*** |
| | (8.12) | (5.21) | (3.62) | (3.78) | (4.87) |
| Industry-Year effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 9,151 | 2,544 | 1,146 | 1,304 | 3,114 |
| Adjusted R-squared | 0.309 | 0.263 | 0.325 | 0.405 | 0.416 |

Table 6. Robustness tests of the valuation life cycle findings

The table reports the results of valuation regressions in the matched sample. The basic regression specification is identical to that of Panel B in Table 5. Panel A examines the effect of choosing a different age cohorts' system. In Panel B, the dependent variable is Total Q instead of Tobin's Q. (*Total Q*, proposed by Peters and Taylor (2017), is measured by scaling firm market value by the sum of physical and intangible capital.) Panel C examines the effect of tighter matching by using only pairs of dual-and single-class firms whose IPO dates are not more than 12 months apart. (Our original analysis allows up to 24 months difference between IPO dates.) Last, Panel D examines the effect of controlling for ownership concentration. *Dual dummy* equals one if the company has a dual-class share structure at the respective fiscal year-end; otherwise the variable is equal to zero. *Equity stake of controlling shareholders* is the proportion of firm equity held by controlling shareholders. T-statistics are based on robust standard errors clustered at the firm level and are given in parentheses. ***, **, and * refers to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. The effect of different age cohorts

| | Years relative to the IPO | | | | | |
|---|---|---|---|---|---|---|
| | All | 0-2 | 3-5 | 6-8 | 9-11 | 12+ |
| Dual dummy | -0.012 | 0.26** | 0.24** | -0.15 | -0.19 | -0.19 |
| | (-0.18) | (2.42) | (2.12) | (-1.18) | (-1.27) | (-1.54) |
| Explanatory variables and controls as in Table 5 Panel B | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 9,151 | 2,860 | 1,873 | 1,304 | 1,003 | 2,111 |
| Adjusted R-squared | 0.309 | 0.290 | 0.330 | 0.405 | 0.474 | 0.383 |

Panel B. The effect of using Total Q as the dependent variable

| | Years relative to the IPO | | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | 0.13 | 0.59*** | 0.48** | 0.071 | -0.19 |
| | (1.12) | (2.86) | (2.35) | (0.38) | (-1.41) |
| Explanatory variables and controls as in Table 5 Panel B | Yes | Yes | Yes | Yes | Yes |
| Observations | 8,725 | 2,433 | 1,097 | 1,265 | 2,941 |
| Adjusted R-squared | 0.227 | 0.151 | 0.223 | 0.170 | 0.170 |

Panel C. The effect of restricting the maximum difference in matched firms' IPO dates to 12 months

| | Years relative to the IPO | | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | 0.10 | 0.24* | 0.36* | 0.10 | -0.073 |
| | (1.10) | (1.74) | (1.95) | (0.65) | (-0.53) |
| Explanatory variables and controls as in Table 5 Panel B | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,634 | 1,312 | 578 | 640 | 1,561 |
| Adjusted R-squared | 0.303 | 0.240 | 0.439 | 0.397 | 0.526 |

Panel D. The effect of controlling for ownership concentration

| | Years relative to the IPO | | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | 0.035 | 0.33* | 0.37* | 0.014 | -0.16 |
| | (0.34) | (1.84) | (1.69) | (0.073) | (-0.78) |
| Equity stake of controlling shareholders | -0.52 | -0.069 | -0.93 | -1.19 | -1.69** |
| | (-0.86) | (-0.058) | (-0.62) | (-1.14) | (-2.24) |
| Equity stake of controlling shareholders squared | 0.80 | 0.29 | 1.48 | 1.31 | 1.76** |
| | (1.05) | (0.20) | (0.70) | (0.93) | (2.13) |
| Explanatory variables and controls as in Table 5 Panel B | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,710 | 1,385 | 724 | 880 | 1,441 |
| Adjusted R-squared | 0.302 | 0.206 | 0.190 | 0.328 | 0.524 |

Table 7. Cross-sectional variation in the valuation life cycle of dual class firms

The table reports the results of OLS regressions from different year clusters relative to the IPO, where the dependent variable is Tobin's Q. *Tobin's Q* is measured as the market-to-book ratio of the firm. Panel A (B) reports the results in a matched sample of dual class firms that had higher (lower) initial (IPO year) Tobin's Q than their single-class matches. The matched sample of dual- and single-class firms is used over the period 1980-2017; matching is done in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA. *Dual dummy* equals one if the company has a dual-class share structure at the respective fiscal year-end, otherwise the variable is equal to zero. *Size* is the natural logarithm of total assets (in MUSD). *ROA* is return on assets, measured as the ratio of net income to total assets. *Capital Expenditures* is the ratio of capital expenditures to total assets. *Research and Development* is the ratio of research and development expenditures to total assets. *PPE* is the ratio of property, plant and equipment to total assets. *Cash balance* is the ratio of cash and short-term investments to total assets. *Leverage* is the ratio of book value of long-term debt to total assets. The first column reports the results from all the firm-years, column (2)—from 1-3 years relative to the IPO, etc. All specifications include year and 48 Fama-French industry groups fixed effects. T-statistics are based on robust standard errors clustered at the firm level and are given in parentheses. ***, **, and * refers to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Matched single- and dual-class firms with a positive initial dual class Tobin's Q premium

| | | Years relative to the IPO | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | 0.52*** | 0.96*** | 0.26 | 0.027 | 0.061 |
| | (5.56) | (6.43) | (1.30) | (0.17) | (0.47) |
| Size | -0.010 | -0.080 | 0.081 | -0.127 | 0.025 |
| | (-0.24) | (-1.08) | (0.88) | (-1.05) | (0.53) |
| ROA | 0.10 | 0.46 | 0.66 | -1.18 | -0.35 |
| | (0.41) | (1.52) | (1.36) | (-1.07) | (-0.93) |
| Capital Expenditures | 0.032*** | 0.008 | 0.029 | 0.022* | 0.034** |
| | (3.99) | (0.77) | (1.60) | (1.79) | (2.41) |
| Research and Development | 0.026*** | 0.028** | 0.030 | -0.018 | 0.019 |
| | (3.13) | (2.17) | (1.38) | (-0.54) | (1.35) |
| PPE | -0.42* | 0.30 | -0.50 | -0.50 | -0.36 |
| | (-1.89) | (0.81) | (-1.15) | (-1.48) | (-1.05) |
| Cash Balance | 0.027*** | 0.026*** | 0.026*** | 0.029** | 0.012*** |
| | (8.39) | (4.34) | (3.39) | (2.05) | (3.16) |
| Leverage | 0.082 | -0.30 | 0.26 | 0.62 | 0.41 |
| | (0.45) | (-0.82) | (0.60) | (1.61) | (1.51) |
| Constant | 1.12*** | 1.51*** | 0.64 | 1.94*** | 1.05*** |
| | (4.42) | (3.48) | (1.08) | (2.99) | (3.53) |
| Industry-Year effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,737 | 1,324 | 609 | 688 | 1,554 |
| Adjusted R-squared | 0.280 | 0.287 | 0.314 | 0.423 | 0.384 |

Panel B. Matched single- and dual-class firms with a negative initial dual class Tobin's Q premium

| | | Years relative to the IPO | | | |
|---|---|---|---|---|---|
| | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | -0.56*** | -0.51*** | 0.17 | -0.23 | -0.37* |
| | (-5.32) | (-3.19) | (0.62) | (-1.09) | (-1.97) |
| Size | -0.15*** | -0.17* | -0.14 | -0.14 | -0.072 |
| | (-2.83) | (-1.93) | (-1.23) | (-1.25) | (-0.80) |
| ROA | 0.50* | 0.74* | 0.12 | 1.25 | 0.98* |
| | (1.73) | (1.73) | (0.18) | (1.53) | (1.69) |
| Capital Expenditures | 0.036*** | 0.018 | 0.007 | 0.038** | 0.053*** |
| | (4.36) | (1.53) | (0.28) | (2.37) | (3.34) |
| Research and Development | 0.071*** | 0.053** | 0.015 | 0.098*** | 0.101*** |
| | (5.21) | (2.27) | (0.56) | (3.31) | (7.42) |
| PPE | -0.83** | -0.55 | 0.45 | -0.17 | -0.81 |
| | (-2.15) | (-0.85) | (0.63) | (-0.29) | (-1.49) |
| Cash Balance | 0.019*** | 0.025*** | 0.028*** | 0.009 | 0.014*** |
| | (4.94) | (2.65) | (3.20) | (0.78) | (2.79) |
| Leverage | 1.00** | 0.005 | -0.053 | 0.670 | 1.86*** |
| | (2.38) | (0.01) | (-0.08) | (0.67) | (2.64) |
| Constant | 2.40*** | 2.83*** | 1.91** | 2.01*** | 1.50*** |
| | (7.29) | (4.76) | (2.59) | (3.03) | (2.75) |
| Industry-Year effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,145 | 1,161 | 507 | 576 | 1,431 |
| Adjusted R-squared | 0.368 | 0.267 | 0.412 | 0.544 | 0.506 |

Table 8. Intertemporal change in the frequency and composition of dual class IPOs

The table reports the number of initial public offerings (IPOs) in the U.S. (listed on the NYSE, NYSE MKT or NASDAQ) during the years 1980-2017. High-technology companies (HiTech) are those with the SIC 3-digit codes 283, 357, 366, 367, 382, 384, 481, 482, 489, 737, and 873 (see Kile and Phillips, 2009). Dual IPOs comprise companies with a dual-class share structure at the IPO.

| Decade | Total number of IPOs | HiTech as percent of Total IPOs | Dual IPOs as percent of Total IPOs | Dual HiTech as percent of All Dual IPOs | Dual HiTech as percent of HiTech IPOs |
|---|---|---|---|---|---|
| 1980-1990 | 2030 | 38.77 | 4.24 | 20.93 | 2.29 |
| 1991-2000 | 4408 | 48.12 | 8.60 | 27.97 | 5.00 |
| 2001-2010 | 851 | 51.00 | 8.81 | 38.67 | 6.68 |
| 2011-2017 | 785 | 54.14 | 15.29 | 38.33 | 10.82 |

Table 9. Intertemporal variations in the life cycle of dual class firm valuations

The table reports the results of OLS regressions from different year-clusters relative to the IPO, where the dependent variable is Tobin's Q. The overall sample period, 1980-2017, is split into two subperiods: 1980-2000 (20th century) and 2001-2017 (21st century). *Tobin's Q* is measured as the market-to-book ratio of the firm. Panel A (B) reports the results in the full (matched) sample of single and dual class firms. In the matched sample of dual- and single-class firms, matching is done in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA. *Dual dummy* equals one if the company has a dual-class share structure at the respective fiscal year-end, otherwise the variable is equal to zero. *Size* is the natural logarithm of total assets (in MUSD). *ROA* is return on assets, measured as the ratio of net income to total assets. *Capital Expenditures* is the ratio of capital expenditures to total assets. *Research and Development* is the ratio of research and development expenditures to total assets. *PPE* is the ratio of property, plant and equipment to total assets. *Cash balance* is the ratio of cash and short-term investments to total assets. *Leverage* is the ratio of book value of long-term debt to total assets. The first column reports the results from all the firm-years, column (2)—from 1-3 years relative to the IPO, etc. All specifications include year and 48 Fama-French industry groups fixed effects. T-statistics are based on robust standard errors clustered at the firm level and are given in parentheses. ***, **, and * refers to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A. Full sample

| | 20th century (1980-2000) | | | | | 21st century (2001-2017) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Years relative to the IPO | | | | | Years relative to the IPO | | | |
| | All | 1-3 | 4-5 | 6-8 | 9+ | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | -0.000 | 0.11 | -0.048 | -0.21** | -0.36*** | 0.033 | 0.54*** | 0.28** | -0.090 | -0.16* |
| | (-0.001) | (1.56) | (-0.45) | (-2.17) | (-3.11) | (0.50) | (4.16) | (2.27) | (-0.97) | (-1.93) |
| Size | -0.027* | -0.051*** | -0.029 | -0.036 | 0.087** | -0.054*** | -0.20*** | -0.16*** | -0.12*** | -0.001 |
| | (-1.66) | (-2.93) | (-1.15) | (-1.03) | (2.10) | (-3.93) | (-5.30) | (-4.66) | (-4.82) | (-0.08) |
| ROA | -0.58*** | -0.49*** | -0.87*** | -0.61** | 0.004 | -0.18* | 0.091 | -0.28 | -0.43** | -0.26 |
| | (-6.97) | (-4.71) | (-4.98) | (-2.57) | (0.01) | (-1.79) | (0.75) | (-1.44) | (-2.42) | (-1.43) |
| Capital Expenditures | 0.036*** | 0.028*** | 0.035*** | 0.047*** | 0.043*** | 0.054*** | 0.033*** | 0.055*** | 0.046*** | 0.066*** |
| | (16.90) | (10.39) | (7.63) | (6.68) | (5.91) | (13.09) | (5.09) | (6.02) | (6.62) | (10.60) |
| Research and Development | 0.028*** | 0.030*** | 0.019*** | 0.033*** | 0.055*** | 0.027*** | 0.017*** | 0.023*** | 0.018*** | 0.035*** |
| | (9.82) | (9.18) | (3.72) | (4.25) | (6.25) | (9.95) | (4.18) | (4.35) | (3.77) | (7.69) |
| PPE | -0.83*** | -0.66*** | -0.75*** | -0.92*** | -0.90*** | -0.99*** | -0.45* | -1.130*** | -0.64*** | -1.24*** |
| | (-7.46) | (-5.11) | (-3.98) | (-3.44) | (-3.00) | (-7.99) | (-1.90) | (-4.36) | (-3.03) | (-7.38) |
| Cash Balance | 0.022*** | 0.018*** | 0.024*** | 0.018*** | 0.023*** | 0.014*** | 0.010*** | 0.015*** | 0.013*** | 0.012*** |
| | (19.38) | (12.00) | (9.49) | (5.30) | (4.98) | (12.13) | (4.99) | (6.20) | (5.80) | (7.39) |
| Leverage | -0.30*** | -0.50*** | -0.38** | 0.34 | 0.18 | 0.61*** | 0.60*** | 0.84*** | 0.48** | 0.58*** |
| | (-2.76) | (-4.13) | (-1.97) | (1.30) | (0.65) | (4.80) | (2.63) | (3.37) | (2.34) | (3.37) |
| Constant | 1.76*** | 1.94*** | 1.64*** | 1.57*** | 0.92*** | 1.80*** | 2.802*** | 2.30*** | 2.17*** | 1.47*** |
| | (22.87) | (21.63) | (12.69) | (9.34) | (4.67) | (20.00) | (11.73) | (10.33) | (13.67) | (13.22) |
| Industry-Year effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 35,125 | 13,755 | 5,496 | 4,827 | 4,896 | 33,556 | 5,245 | 3,366 | 5,032 | 18,371 |
| Adj R-squared | 0.282 | 0.252 | 0.269 | 0.254 | 0.270 | 0.254 | 0.208 | 0.235 | 0.231 | 0.289 |

Panel B. Matched sample

| | 20th century (1980-2000) | | | | | 21st century (2001-2017) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Years relative to the IPO | | | | | Years relative to the IPO | | | |
| | All | 1-3 | 4-5 | 6-8 | 9+ | All | 1-3 | 4-5 | 6-8 | 9+ |
| Dual dummy | -0.005 | 0.19 | 0.24 | -0.19 | -0.38 | 0.022 | 0.28 | 0.19 | -0.06 | -0.12 |
| | (-0.05) | (1.59) | (1.51) | (-0.85) | (-1.56) | (0.25) | (1.50) | (0.93) | (-0.40) | (-1.14) |
| Size | 0.013 | -0.009 | 0.096 | 0.131 | 0.095 | -0.067** | -0.153 | -0.128* | -0.136* | -0.022 |
| | (0.33) | (-0.16) | (1.47) | (1.44) | (0.72) | (-2.00) | (-1.30) | (-1.72) | (-1.74) | (-0.55) |
| ROA | -0.013 | 0.38 | -0.34 | 0.36 | 0.37 | 0.59** | 0.90** | 0.82* | -0.30 | 0.28 |
| | (-0.05) | (1.11) | (-0.61) | (0.41) | (0.38) | (2.21) | (2.54) | (1.74) | (-0.36) | (0.62) |
| Capital Expenditures | 0.027*** | 0.017** | 0.012 | 0.022** | 0.029** | 0.058*** | 0.037* | 0.071** | 0.050** | 0.045*** |
| | (4.44) | (2.44) | (0.95) | (2.15) | (2.56) | (5.10) | (1.88) | (2.01) | (2.48) | (3.23) |
| Research and Development | 0.062*** | 0.045*** | 0.045** | 0.082*** | 0.105** | 0.044*** | 0.016 | 0.001 | 0.011 | 0.071*** |
| | (4.63) | (3.26) | (2.06) | (2.67) | (2.52) | (3.17) | (1.16) | (0.10) | (0.36) | (4.51) |
| PPE | -0.49* | -0.14 | 0.34 | -0.12 | -0.90 | -0.86*** | -0.33 | -0.99* | -0.71* | -0.82*** |
| | (-1.73) | (-0.48) | (0.92) | (-0.24) | (-1.18) | (-3.11) | (-0.43) | (-1.83) | (-1.76) | (-2.68) |
| Cash Balance | 0.026*** | 0.027*** | 0.029*** | 0.021* | 0.027** | 0.024*** | 0.034*** | 0.018*** | 0.023** | 0.013*** |
| | (6.35) | (4.24) | (3.74) | (1.66) | (2.30) | (7.29) | (4.56) | (2.70) | (2.10) | (3.81) |
| Leverage | -0.27 | -0.62** | -0.78** | 0.35 | 0.31 | 1.02*** | 0.70 | 0.49 | 0.97* | 1.22*** |
| | (-1.01) | (-2.44) | (-2.19) | (0.52) | (0.52) | (2.96) | (1.23) | (1.32) | (1.67) | (2.87) |
| Constant | 1.39*** | 1.54*** | 0.58 | 0.42 | 0.84 | 1.52*** | 2.19** | 2.20*** | 2.00*** | 1.27*** |
| | (5.67) | (4.77) | (1.45) | (0.86) | (1.39) | (6.32) | (2.53) | (4.12) | (4.37) | (4.56) |
| Industry-Year effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,117 | 1,690 | 610 | 518 | 539 | 5,034 | 854 | 536 | 786 | 2,575 |
| Adj R-squared | 0.314 | 0.224 | 0.396 | 0.583 | 0.374 | 0.322 | 0.327 | 0.340 | 0.290 | 0.430 |

Table 10. The effect of dual class firm's listing age (time from IPO) on unification frequency

The table reports the results of pooled probit regressions, where the dependent variable is an indicator variable equal to one in the year preceding a share class unification. The sample of all dual-class firms is used over the period 1995-2017. *Controlling shareholders' equity* is the fraction of cash flow rights held by the controlling shareholders. *Controlling shareholders vote* is the fraction of voting rights held by the controlling shareholders. *Control minus Ownership (wedge)* is the difference between controlling shareholders' vote and equity rights. *Ln Years from IPO* is the natural logarithm of the number of years since the IPO. *Media dummy* equals one if the company belongs to the media industries that are defined as SIC Codes 2710-11, 2720-21, 2730-31, 4830, 4832-33, 4840-41, 7810, 7812, and 7820. *Size* is the natural logarithm of total assets (in MUSD). *Growth opportunities* is measured as the median Tobin's Q ratio of single-class firms in the respective 48 Fama and French (1997) industry group *Equity issue dummy (Years +1, +2 or +3)* equals one if the company issues common or preferred stocks in years t+1, t+2 or t+3, otherwise the variable equals zero. All specifications include year fixed effects. Z-statistics are based on robust standard errors clustered at the firm level and are given in parentheses. ***, **, and * refers to statistical significance at the 1%, 5%, and 10% level, respectively.

| | (1) | (2) | (3) |
|---|---|---|---|
| Control minus Ownership | -1.35*** | -1.36*** | |
| | (-4.95) | (-4.99) | |
| Controlling shareholders' equity | | | -0.0034 |
| | | | (-1.61) |
| Ln Years from IPO | -0.09* | 0.34 | 0.26 |
| | (-1.93) | (1.52) | (1.19) |
| Squared Ln Years from IPO | | -0.13** | -0.12* |
| | | (-1.97) | (-1.95) |
| Media dummy | -0.37** | -0.39** | -0.47*** |
| | (-2.12) | (-2.27) | (-2.77) |
| Size | -0.04 | -0.04 | -0.03 |
| | (-1.60) | (-1.47) | (-1.37) |
| Growth opportunities | 0.17*** | 0.16*** | 0.17*** |
| | (3.21) | (3.16) | (3.13) |
| Equity issue dummy (Years +1, +2 or +3) | 0.40*** | 0.40*** | 0.31*** |
| | (3.22) | (3.26) | (2.59) |
| Constant | -1.75*** | -2.01*** | -1.96*** |
| | (-7.37) | (-7.48) | (-6.88) |
| Year dummies | Yes | Yes | Yes |
| Observations | 3,350 | 3,350 | 3,343 |
| Pseudo R-squared | 0.082 | 0.086 | 0.058 |

Figure 1. The relative valuation of dual- vs. single-class firms along the life cycle

The figure reports the mean difference between the Tobin's Q of dual-class firms and their matched single-class firms in years relative to the IPO. Tobin's Q is the ratio of the book value of assets plus the market value of common stocks less the book value of common stocks and deferred taxes to book value of assets. The sample includes 538 dual- and 538 single-class firms that are matched in the IPO year according to the 48 Fama and French (1997) industry groups, firm size (assets), and ROA. 'IPO' denotes the fiscal year end following the IPO. 'IPO+1' denotes the fiscal year end one year after the IPO, and so on.

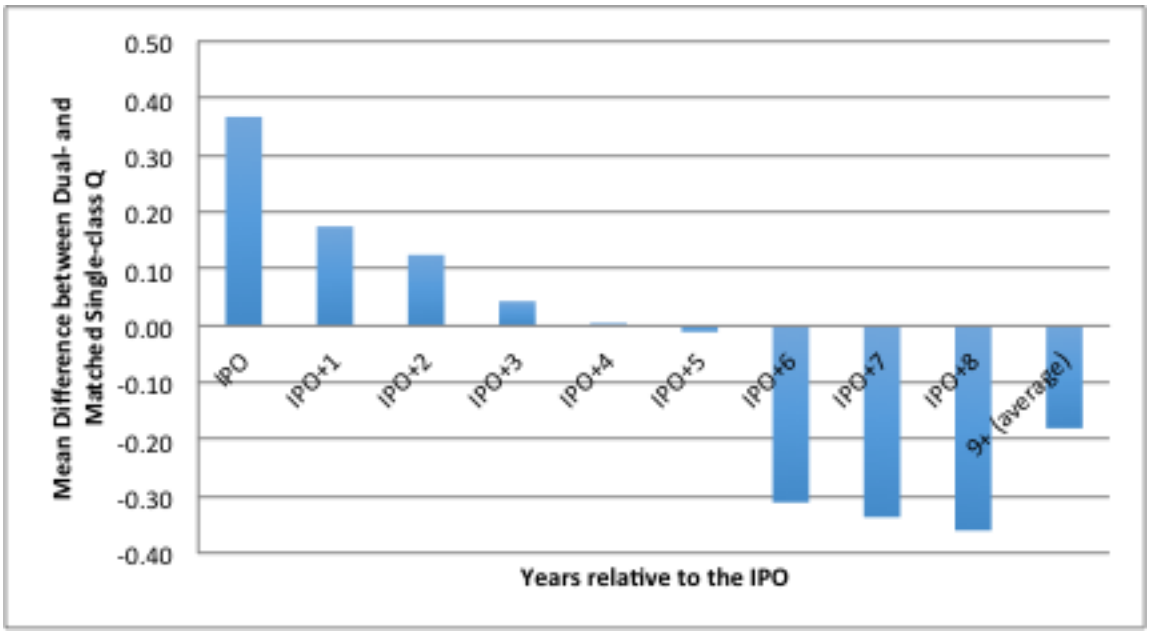

Figure 2. Voluntary dual class share unifications along the life cycle

The figure presents the number of unifications in years relative to the IPO. In this figure, we use a sample of 450 dual-class firms that had an IPO in the year 2008 or earlier, i.e. firms that could have survived for 9 years (by the end of 2017) after the IPO.