Riding off into the Sunset: Dual-Class Structure in the Age of Unicorns Going Public

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Abstract

The increasing adoption of dual-class shares (DCS)—an ownership structure that gives corporate insiders greater voting power than other shareholders—among newly listed companies has raised significant governance concerns. We investigate the decision to adopt the DCS structure and its value implications in the recent U.S. IPOs. Using founder cultural traits and Silicon Valley law firms as instrumental variables, we find significant post-IPO outperformance by firms adopting DCS with a sunset clause, especially incapacity-based sunset which stipulates that the DCS will cease after founders' death, incapacitation or departure, compared to non-DCS firms and DCS firms without sunsets. This outperformance is more pronounced for high-tech firms, after Google's IPO, and for firms that rely more on R&D. DCS firms with sunset provisions have greater operating efficiency, marginal value of cash, and more innovation outputs but lower quality ones, which is in line with the incentive schemes provided to their executives.

Keywords: dual-class shares, sunset provisions, entrenchment, anti-takeover provisions

JEL Classifications: G32, G34

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ABSTRACT

The increasing adoption of dual-class shares (DCS)—an ownership structure that gives corporate insiders greater voting power than other shareholders—among newly listed companies has raised significant governance concerns. We investigate the decision to adopt the DCS structure and its value implications in the recent U.S. IPOs. Using founder cultural traits and Silicon Valley law firms as instrumental variables, we find significant post-IPO outperformance by firms adopting DCS with a sunset clause, especially incapacity-based sunset which stipulates that the DCS will cease after founders' death, incapacitation or departure, compared to non-DCS firms and DCS firms without sunsets. This outperformance is more pronounced for high-tech firms, after Google's IPO, and for firms that rely more on R&D. DCS firms with sunset provisions have greater operating efficiency, marginal value of cash, and more innovation outputs but lower quality ones, which is in line with the incentive schemes provided to their executives.

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I. Introduction

The recent advent of public listings by high-growth technology startups has created intense debate on relaxing listing requirements, particularly on allowing listings with dual-class shares—as opposed to the one share, one vote principle—around the world. The so-called unicorns, that is, privately held startups valued at over one billion U.S. dollars, such as Airbnb and Ant Group, often prefer to adopt two classes of shares with differing voting rights. The most common dual-class share (DCS) structure offers the inferior shares one vote per share to the public while giving company insiders the superior shares, for example, ten votes per share. The superior shares, typically reserved for founders, create a significant wedge between voting and cash-flow rights, insulating insiders from market pressures and giving them control over all significant decisions, including whether they keep their positions. Contrary to the traditional dual-class firms, which families often control over generations, the unicorns going public with dual-class shares typically have entrepreneur founders as the management and operate in high-tech industries. A notable example was Google's initial public offering (IPO) on August 19, 2004. Google's founders, Sergey Brin and Larry Page, together with other corporate insiders, decided to retain majority voting power by holding Class B common stock, which entitled them to ten votes per share. In response to the rise of high-tech firms going public with DCS, global stock exchanges that traditionally hewed to the one share, one vote rule for listings, such as those in Hong Kong, Singapore, Shanghai, and London, are embracing IPOs with DCS.[1]

[1] The move by HKEX was motivated mainly by missing the listing of Alibaba, China's largest e-commerce company, which went public in the New York Stock Exchange (NYSE) on September 14, 2014. Before choosing New York, Alibaba had expressed its frustration on the strict "one share, one vote" principle in the HKEX. Realizing that more unicorns from China, such as Ant Financial, might also be driven away by the one share, one vote rule, in 2018, the HKEX amended its listing requirement to accommodate dual-class IPOs, and Xiaomi, a Chinese smartphone manufacturer, became the first company to go public with dual-class shares in the HKEX. Shortly after that, Alibaba "returned" to Hong Kong by dual listing on the HKEX in November 2019. See "How Hong Kong Lost the Alibaba IPO" by Enda Curran, *The Wall Street Journal*, March 15, 2014.

Despite the global move toward allowing DCS listings, the literature considers DCS a governance concern that can harm firm performance (Bebchuk and Kastiel, 2017; Gompers, Ishii, and Metrick, 2010). The insiders of most DCS firms choose their ownership structure before they go public, and so the literature argues that they adopt the dual-class structure so as to extract private benefits of control (DeAngelo and DeAngelo, 1985; Grossman and Hart, 1988). For example, Masulis, Wang, and Xie (2009) document that DCS firms exhibit higher executive compensation and pursue more value-destroying acquisitions than single-class share firms.[2] The insiders holding DCS enjoy those perquisites at the expense of shareholders. As a result, replacing the insiders can improve the firms' performance (Ewens and Marx, 2017).[3] In accordance with the concerns from both researchers and practitioners, the Council of Institutional Investors (CII) has suggested that the major exchanges, such as the NYSE and National Association of Securities Dealers Automated Quotations (NASDAQ), should impose the one share, one vote rule to all listed firms. BlackRock, one of the largest asset management companies globally, has expressed similar governance concerns about DCS.[4]

In contrast, proponents of DCS argue that insulating founders and management from the short-termism of the stock market may pay off in the long run. Immunity from short-term market pressure is valuable for high-tech startups that rely on entrepreneurs' human capital. In an analytical model, Chemmanur and Jiao (2012) show that DCS can be optimal in an industry where projects are highly risky but also highly profitable. In

[2] Similarly, Amoako-Adu, Baulkaran, and Smith (2011) find that dual-class companies pay executives more, even compared to single-class companies with concentrated ownership. They hypothesize that the controlling shareholders are rewarded with large option grants and bonuses so that their interests are aligned with those of outside shareholders.

[3] Besides the academic debate, there has also been increasing concern from industry about DCS. On February 12, 2019, *The Wall Street Journal* noted: "The issue has taken on increased import after Facebook, and other companies with extra control for founders stumbled lately. … Facebook stock took a sharp hit after negative headlines led to questions about Chief Executive Mark Zuckerberg's leadership and his controlling stake in the company." See "Lyft founders to tighten grip with supervoting shares in IPO" by Maureen Farrell and Cara Lombardo, *The Wall Street Journal*, February 12, 2019.

[4] "BlackRock, Calpers want exchanges to clamp down on dual-class shares" by Dawn Lim, *The Wall Street Journal*, October 24, 2018.

such a case, DCS may help managers focus on valuable long-term projects without worrying about short-term market pressures. Indeed some scholars find that dual-class firms are associated with higher research and development (R&D) expenses and greater innovation, compared to single-class firms (Baran, Forst, and Via, 2019; Jordan, Kim, and Liu, 2016; Lehn, Netter, and Poulsen, 1990). A few studies report that dual-class firms outperform their single-class counterparts in specific settings (Boehmer, Sanger, and Varshney, 1995; Cremers, Lauterbach, and Pajuste, 2018; Dimitrov and Jain, 2006; Kim and Michaely, 2019).

A crucial feature of DCS is whether the arrangement contains a sunset clause, which is believed to address some of the governance concerns. In the context of DCS, a sunset provision is incorporated in the corporate charter and automatically converts the DCS to single-class shares when specific conditions are met. Sunset provisions can be time-based (the conversion of superior shares after a particular period) or incapacity-based (the conversion upon the death or incapacity of an owner of superior shares). Other sunsets occur with the transfer of shares with supervoting powers.

The rationale behind the call for sunset clauses, especially time-based ones, is that the potential advantages of dual-class structures tend to recede and the potential costs tend to rise as time passes post IPO. Our data provide supporting statistics for this conjecture. Figure 1 shows the post-IPO performance of our sample, measured by the valuation over time of one dollar invested at the time of IPO. Consistent with the life-cycle hypothesis, DCS firms outperform in the early years compared to single-share-class firms, but the early-stage outperformance dissipates after five to seven years from the IPOs.

[Place Figure 1 about here]

The pattern in Figure 1 suggests a dynamic effect of founders on firm value. In the first few years, firms' success significantly depends on the founders' vision and leadership. As firms age, the valuation premium of the early years dissipates, probably because of agency problems aggravated at DCS firms by the disparity between controlling shareholders and other shareholders. Indeed empirical evidence confirms that the valuation difference between dual-class and single-class firms varies over their lifetime (Cremers et al., 2018; Kim and Michaely, 2019). Dual-class firms show a valuation premium, compared to single-class firms, from their IPOs until several years later. However, they lose the premium gradually. Evidence indicates that mature firms eventually dismantling the DCS structure experience positive abnormal returns (e.g., Dittmann and Ulbricht, 2008). However, since time-based sunset clauses benefit mainly noncontrolling shareholders but instead put constraints on the founders who strongly influence the design of DCS structure (Winden, 2018), voluntary adoption of time-based sunsets can be difficult without legal mandates (Bebchuk and Kastiel, 2017). In 2018, CII submitted an open letter to NYSE asking the exchange to require newly listed companies to specify a seven-year sunset for DCS.[5] However, some commentators criticize time-based sunsets for their one-size-fits-all approach (Fisch and Solomon, 2019), while others are concerned about the end-game problem triggered when shareholders with supervoting powers anticipate a predetermined expiration of their rights.[6] Simply put, there is no consensus on the merit of sunset clauses to investors and IPO firms. Figure 2 presents the difference in post-IPO performance between DCS firms with and without sunset clauses. Those with sunsets deliver significantly higher returns than those without until 12 years after the IPO.

[Place Figure 2 about Here]

In this paper, we aim to provide a deeper understanding of the recent emergence of DCS and the use of sunset provisions among unicorns going public. To this end, we

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[5] "CII petition to New York Stock Exchange" by Ash Williams, chair; Ken Bertsch, executive director; and Jeff Mahony, general counsel; Council of Institutional Investors, letter to Elizabeth King, chief regulatory officer, Intercontinental Exchange, October 24, 2018.

[6] "Dual class stock: The shades of sunset" by John C. Coffee, Jr., Columbia Law School Blue Sky Blog, November 19, 2018.

assemble a sample of 2,061 listed firms over the period of 1996 to 2019 and manually check their IPO prospectus (S-1 filing), the CII website, and other online sources for the specific details of each company's share structure, including the existence and nature of sunset clauses. Using this sample, we find that DCS firms with sunset provisions—especially incapacity-based sunsets[7] but also combined with time-based sunsets—have greater post-IPO market valuation than non-DCS firms and DCS firms without sunsets.

We match DCS IPOs with non-DCS IPOs to reduce the possibility that the difference between the two groups originates from their different firm and industry characteristics, rather than DCS adoption. To further alleviate potential endogeneity concerns, we use two unique instrumental variables (IVs): (1) founders' cultural backgrounds for DCS adoption, and (2) IPO legal counsels for the inclusion of a sunset clause in the DCS structure.

For the first IV, we argue that the decision to adopt DCS is fundamentally driven by the founder's desire to maintain control, which is further shaped by her cultural background. As the U.S. is an immigration country, such cultural background can usually be traced back to the founder's ancestors from other countries. We identify the cultural background of an IPO firm's founder by tracing her ancestors' country of origin, using family names on multiple web sources, such as Wikipedia, Ancestry.com, HouseofNames.com, and SurnameDB.com. The assumption is that culture is a highly persistent trait that can carry over several generations, even for immigrants. Therefore a startup founder's cultural characteristics will correlate with those of her or his ancestors. We then use the World Values Survey scores on the hierarchical culture of the founder's ancestral country as a proxy for the culturally motivated desire to maintain power and,

[7] Here, incapacity-based sunsets include sunset clauses which can be triggered by death, incapacitation, and departure of the founder.

thus, the propensity to adopt a DCS when her or his firm's ownership is about to be diluted by going public.

For IPO legal counsels as an IV for sunset clause adoption, we follow Winden (2018) in arguing that Silicon Valley law firms are more likely to design DCS (with sunset clauses) in a way that is distinct from what other legal counsels, such as those from the Wall Street, would do and that this style emerges long before they are hired by firms that are going public. Therefore the choice of legal counsel by the IPO firm is usually not motivated by the lawyer's DCS style, but this style will determine the share structure (including DCS and sunset clauses) during and after the IPO.

We conduct a two-stage least-square (2SLS) analysis using these two IVs confirms our baseline results. The first-stage results indeed show that firms are more likely to have this structure when their founders' ancestors were from countries with more hierarchical cultures. Among DCS firms, they are more likely to adopt sunset provisions when Silicon Valley law firms advise them. In the second stage, DCS and the presence of sunset clauses are still positively correlated with Tobin's Q.

We then dig deeper into the analysis of sunset provisions by decomposing sunset clauses into those that are time-based, incapacity-based, and transfer-based. Bebchuk and Kastiel (2017) and Kim and Michaely (2019) argue that a transfer-based sunset is ineffective in mitigating agency concerns involved with DCS firms as it depends on the discretionary action of superior class shareholder, and advocate for the adoption of the other two types, especially the time-based one. In contrast, Fisch and Davidoff-Solomon (2019) argue that time-based sunsets may still be ineffective due to its one-size-fits-all nature. In OLS analysis on the sample of DCS firms, we find those with incapacity-based sunsets have greater value, though in the 2SLS analysis all the three types of sunset have positive valuation effects.

In addition, we find that the outperformance of DCS firms, especially those with sunset clauses, is greater for high-tech firms, those going public after Google's IPO, and those that rely more on R&D. These results provide assurance that the positive valuation effects of DCS are driven by the new-generation innovative firms, which differ from firms studied in earlier samples, reconciling our differing findings with the literature.

Exploring the potential channels through which DCS and sunset clauses might affect high-tech firms' valuation, we find that DCS firms in general and those with sunsets in particular tend to have higher operating efficiency, as measured by asset turnover and the marginal value of cash holdings. These results suggest that DCS with sunsets bring better management and more value-enhancing investment opportunities to a firm, corroborating the idea that DCS helps firms more fully deploy their founders' human capital. We further show that DCS firms have more patents than single-share-class firms but that innovation quality tends to be lower and less explorative for DCS firms with sunsets. These firms also tend to have higher delta but lower vega of their CEO compensation. These findings are consistent with the notion that, although DCS isolates founders from market short-termism and focuses them on long-term innovation, the disciplinary role of sunsets encourages managers to pursue exploitative, instead of explorative, innovation.

Two guideposts can be used to place our findings in the context of the literature. First, we delve into DCS by empirically focusing on an essential yet largely unexplored feature of its structure—sunset clauses—and we analyze the causal effect of this feature on firm value. Studies on corporate governance mostly investigate the general association between the presence of DCS and firm value. Some concurrent papers track the relationship between DCS and firm value in the years after IPOs, suggesting the existence of a life cycle in DCS firms (Cremers et al., 2018; Kim and Michaely, 2019). Unlike the literature, we divide DCS into several categories, depending on the sunset provisions. We also use novel IVs for the adoption of both DCS and sunset clauses, which would not be possible when examining DCS alone. The decomposition of DCS structures and a novel identification strategy enable us to identify ownership structures that maximize firm value in the long run.

Second, we focus on DCS adoption in the new era, where gigantic high-tech firms dominate the IPO markets around the world. The DCS firms studied in the literature are usually mature or do not require highly specific human capital for their long-term survival. Their DCS adoptions were traditionally for historical reasons (e.g., founding families trying to maintain control). They typically belonged to traditional industries with low entry barriers. In these cases, it was natural to underscore the costs of DCS associated with controlling shareholders' private benefits. In contrast, our sample consists of the recent dual-class IPOs in high-tech industries, including Google's IPO, where founders' influence on the core technologies cannot be underestimated. As Adams and Ferreira (2008, p.84) argue: "Results are likely to vary across different institutional environments, [and] across firms with different characteristics."

Our findings also have important policy implications, considering the recent deregulation of listing requirements in exchanges around the world. Our results justify the lifting of the one share, one vote restriction by stock exchanges, such as HKEX and SGX, but only if provided with adequate safeguards to prevent minority shareholders from bearing the costs of dual-class shares. In particular, we suggest time- and incapacity-based sunset provisions as ways to ensure that the market will discipline these firms in the long run (Bebchuk and Kastiel, 2017; Kim and Michaely, 2019). However, a trade-off in mandating sunset clauses for DCS IPOs can be the weakened incentives for their insiders to pursue innovation and take risks.

II. Data and Methodology

To construct our main sample, we begin by retrieving a list of all IPOs in the United States (U.S.) from Security Data Company (SDC) Platinum. We then compile a comprehensive list of dual-class IPOs from multiple sources. First, we obtain a list of dual-class companies from CII. The list contains the U.S.-incorporated Russell 3000 firms with at least two outstanding common stock classes with unequal voting rights as of March 2017. We refer to the list of Winden (2018) to supplement the CII's list. We also manually collect information on dual-class shares from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) System of the Securities Exchange Commission (SEC) by reading the final amendments to IPO prospectuses (S-1/A filings). We exclude companies in banking, insurance, real estate, trading, and other financial sectors because their capital structure differs from that of other firms, and they are subject to a different set of regulations. We do not include IPOs before 1996 since EDGAR filings only became mandatory in early 1996. We also remove limited partnerships and limited liability companies from our sample because they have different governance structure from corporations. We identify approximately 190 (9.22% of the sample) U.S. companies that went public with DCS among the 2,061 IPOs from 1996 to 2019. In contrast, 1,872 (90.78%) IPOs are single-class shares. Table II presents the number of dual- and single-class IPOs from 1996 to 2019.

[Place Table II about here]

For each of the dual-class IPOs in our sample, we manually check whether the company has a sunset provision specified in its prospectus. In particular, we distinguish among time-, incapacity-, and transfer-based sunsets, and pay special attention to the first two, given the concerns on the ineffectiveness of transfer-based sunsets. A time-based sunset clause requires an automatic conversion of the firm's superior shares into ordinary shares (common stock) within a particular period following the IPO. An incapacity-based sunset clause stipulates the automatic conversion of the shares upon the death or incapacity of a controlling shareholder. Other types of sunset provisions discussed in the corporate law literature include transfer- and dilution-based sunsets (See Winden, 2018, for example). In contrast to time- and incapacity-based sunsets, corporate insiders can manipulate the triggering of transfer- and dilution-based sunsets. For instance, founders can choose the conversion timing by selling their shares to outside investors under transfer-based sunsets. They can also trigger dilution-based sunsets by proposing an issue of additional shares in a shareholders' meeting. Among the 190 dual-class firms in our sample, 41 (21.58%) firms adopted time-based sunsets when they went public, and 44 (23.16%) adopted incapacity-based sunsets. The number of firms with both types of sunsets is 15, which amounts to 7.89% of all dual-class IPOs. In contrast, transfer-based sunsets are more often adopted by dual-class firms, as 167 (87.89%) have such sunsets.

It is important to control a firm's overall governance quality in our analysis. We follow Bebchuk, Cohen, and Ferrell (2009) to collect data on six critical governance indicators: a staggered board, a limitation on amending bylaws by shareholders, a limitation on amending the corporate charter by shareholders, supermajority approval for a merger, poison pills, and a golden parachute. These six provisions constitute the Entrenchment Index (E-Index), one of the most commonly used measures in the corporate governance literature. However, some scholars have recently challenged the E-Index's validity, as some components require bilateral shareholder agreement whereas others do not.[8] To alleviate this concern and better illuminate how different governance mechanisms affect firm value, we follow Cremers et al. (2016) and decompose the E-Index into the Commitment Index (C-Index) and the Incumbent Index (I-Index). The C-Index consists of the staggered board, the limitation on amending the charter, and

[8] For example, Bebchuk, Cohen, and Wang (2013), who include two original authors of E-Index, find that the correlation between the E-Index and abnormal returns disappears in the latest sample. Cremers, Masconale, and Sepe (2016) find that the I-Index is associated with lower whereas the C-Index is associated with higher firm value.

supermajority approval for mergers, all of which require shareholder approvals when adopted. The I-Index comprises poison pills, golden parachutes, and the limitation on amending bylaws, none of which requires shareholder approval for adoption.

To construct the indexes, we use data from ISS Governance (formerly known as RiskMetrics), which has provided information on takeover defenses and other governance mechanisms in Standard & Poor's (S&P) 1500 companies since 1996. However, ISS Governance alone does not cover enough firms included in our DCS sample. We therefore manually check the adoption of the six provisions for non-ISS-covered firms from their IPO prospectus. We further supplement our data with MSCI's GovernanceMetrics International (GMI) Ratings, covering Russell 3000 companies from 2001 onward. Table III shows our summary statistics.

[Place Table III about here]

We examine the long-term valuation of dual-class firms. Our primary valuation measure is Tobin's *Q*, calculated as the book value of the total assets minus the book value of equity plus the market value of equity divided by the book value of the total assets. We regress *Q* using various specifications with a focus on dual-class shares, takeover defenses, and sunset provisions. We include control variables, including the logarithm of total assets (*ln(Assets)*), the debt-to-asset ratio (*Debt/Assets*), the return on assets (*ROA*), capital expenditure scaled by assets (*CapEx/Assets*), and R&D expenditure divided by the total sales (*R&D/Sales*). All accounting and financial variables are lagged for one year and winsorized at 1% and 99%. We rely on Compustat for annual financial statement data.

We match DCS IPOs with similar non-DCS IPOs. To be specific, we choose matched non-DCS IPOs based on the following criteria. (1) The matched non-DCS firm goes public in the same year as the DCS firm. (2) The matched firm is in the same industry as the DCS firm. (3) Among those firms satisfying the two preceding conditions, the matched firm at its IPO has the market capitalization closest to the market capitalization of the

DCS firm. As a result, the matched sample consists of 190 DCS IPOs and 190 non-DCS IPOs with similar characteristics. Table IV compares the characteristics of the two groups. Results from t-tests indicate no significant differences between them at the end of their IPOs, except for firm size measured by *ln(Assets)*: the difference between the means of the two groups is significant at 10%.

[Place Table IV about here]

After investigating the relationship between firm value and DCS structures, we further test whether the relationship is stronger for particular firms, namely those in high-tech industries, went public after Google's IPO, and relied heavily on R&D expenditures. Like Loughran and Ritter (2004), we define high-tech firms as those with the following four-digit Standardized Industrial Classification (SIC) codes: 3571, 3572, 3575, 3577, 3578 (computer hardware), 3661, 3663, 3669 (communication equipment), 3671, 3672, 3674, 3675, 3677, 3678, 3679 (electronics), 3812 (navigation equipment), 3823, 3825, 3826, 3827, 3829 (measuring and controlling devices), 3841, 3845 (medical instruments), 4812, 4813 (telephone equipment), 4899 (communications services), and 7371, 7372, 7373, 7374, 7375, 7378, and 7379 (software). Among the dual-class IPOs, 38.95% (74 firms) are in high-tech industries, and among single-class IPOs, 37.57% (703 firms) are in high-tech industries. This difference in the two ratios is not statistically significant; the difference is 0.014 with a t-value of 0.3721. For post-Google IPO period, we look at whether a firm went public after 2004. For reliance on R&D expenditure, we count whether a firm has a positive R&D expenditure as reported in Compustat.

We use several measures of patents to examine the innovation channel of how DCS and sunsets affect firm value, which include the number of patents, the quality-adjusted citation-based number of patents following Hirshleifer et al. (2017) and Kogan et al. (2017), as well as the originality and generality of patents following Gao, Hsu, Li, Zhang (2020). Information on patent and citation is obtained from the patent database of Kogan et al.

(2017), which links each patent and its citations to a Compustat public firm (if the assignee is a public firm) and covers all patents awarded by the U.S. Patent and Trademark Office (USPTO).

We also examine whether DCS firms and non-DCS firms reward their CEOs differently. We use *CEODelta* and *CEOVega* as measures of pay-performance sensitivity and wealth to stock volatility (Coles, Daniel, and Naveen, 2006; Guay, 1999). We obtain compensation, including salaries, bonuses, and stock options of managers and directors from ExecuComp, and calculate *CEODelta* and *CEOVega* following the literature.[9]

III. Dual-Class Shares and Firm Value

This section provides the main empirical results based on the data and methodology described above.

A. Baseline results

We examine the difference in the market valuation of firms that go public with and without DCS structures by using Tobin's *Q* as a proxy for firm value. While there has been intensive debate on the validity of the measure (e.g., Bartlett and Partnoy, 2018; Dybvig and Warachka, 2015), *Q* is still the most commonly used measure for firm value (Erickson and Whited, 2000; Erickson and Whited, 2012; Peters and Taylor, 2017). To this end, we regress *Q* on dual-class share structures and other control variables, which are one-year lagged, as well as industry-fixed and year-fixed effects. The results are reported in Table IV.

[Place Table V about here]

In column (1) of Table V, we find that *DCS* has a positive coefficient (1.001), statistically significant at 1%. This positive relationship between *DCS* and *Q* still holds

[9] We use the codes that are made public by Lalitha Naveen (https://sites.temple.edu/lnaveen/data/) and Kai Chen (http://kaichen.work/?p=211).

for the matched sample (with 190 non-DCS firms that went public in the same year as their matched DCS counterparts), with a coefficient of 0.468, statistically significant at 10% (Column 2). This result contrasts with previous findings focusing on the negative effects of dual-class shares (e.g., Gompers et al., 2010). One plausible reason for this inconsistency is that our sample covers firms with different characteristics in different eras. Our sample consists of recent IPOs in the United States, particularly in high-tech industries. In contrast, the literature on the adverse impact of DCS mostly uses samples comprising relatively mature firms. Our results imply that the effect of DCS structures on firm value may be heterogeneous, depending on the specific designs of the structures that firms adopt.

Next, we examine the effect of having a sunset clause on firm value for firms that adopt the DCS structure. In column (3) of Table V, we include *Sunset1* as a primary independent variable which is an indicator for whether a firm has time- or incapacity-based sunset, or both. This indicator takes an integral value of zero to two. The choice of focusing on these two types of sunset, instead of the transfer-based one, is motivatd by the argument that latter depends on the discretionary actions of corporate insiders who hold superior class shares thus is unlikely to solve any ex post agency problem involved with DCS (Bebchuk and Kastiel, 2017; Kim and Michaely, 2019). The estimate is positive (0.268), consistent with the notion that DCS with an "effective" sunset provision is associated with greater firm value than without such a provision. In column (4), we replace *Sunset1* with *Sunset 2*, which is a binary indicator for whether a firm has any of time- and incapacity-based sunsets, and find the coefficient remains positive and significant (0.396). In column (5), we replace Sunset1 with *Sunset 3*, a binary indicator for whether a firm has any sunset clause (including transfer-based sunset), and find it insignificant. This further corroborates the argument that a transfer-based sunset, which accounts for a majority of sunsets adopted by DCS firms, is ineffective in curbing agency problem. Overall, these baseline results imply that investors perceive DCS structure in high-tech companies, especially that with a sunset clause which is not transfer-based, to be value-enhancing. Arguably, such a structure on one hand deploys the founder's human capital and enables the firm to focus on the long term, and on the other hand disciplines the corporate insiders from overindulging their power.

B. Instrumental variable analysis

The results in Table V may be subject to endogeneity issues commonly observed in corporate finance research. For example, the adoption of DCS may be a result of firm performance, not the cause. That is, insiders of firms with better financial prospects may be more likely to adopt DCS, although it is hard to reconcile this argument with a similar pattern in the relationship between sunset provisions and firm value. If DCS adoption results from potential outperformance, insiders are unlikely to accept sunset provisions that limit their power. Nevertheless, DCS adoption, including sunset clauses, and firm value may be jointly influenced by other observable and unobservable heterogeneities across firms, such as corporate culture and other governance mechanisms. To further alleviate endogeneity concerns, we apply an instrumental variable (IV) approach by using two IVs, one for adopting the DCS structure and one for designing sunset clauses.

In particular, we explore the founder's ancestral cultural background as an IV for the adoption of DCS. To do so, we first identify the origin country of each founder by searching family names on the internet. This allows us to match each founder to a country. We then rely on the World Values Survey (WVS) and European Values Survey (EVS) to construct a dataset on each country's culture. Studies on the intersection between culture and finance have identified three important aspects of culture that affect financial market activities: trust, hierarchy, and individualism (e.g., Ahern, Daminelli, and Fracassi, 2015; Eun, Wang, and Xiao, 2015). We pay particular attention to a variable indicating whether people prefer hierarchy to egalitarianism, as this cultural trait captures people's desire for power, which is a major reason that a founder might adopt the DCS structure. The corresponding question in the survey is:

"Some say that one should follow instructions of one's superiors even when one does not fully agree with them. Others say that one should follow one's superiors' instructions only when one is convinced that they are right. Which of these two opinions do you agree with?"

From the survey results, we create a continuous variable, *Hierarchy*, ranging from one to three, with a value close to one indicating that people in the country prefer egalitarianism and a value close to three meaning they prefer hierarchy. We posit that founders who prefer hierarchy, which gives them more power, are more likely to adopt DCS as part of their firms' IPO. In other words, we expect to observe a positive relationship between DCS and *Hierarchy*.

We also use IPO legal counsels in Silicon Valley as an IV for adopting sunset provisions for several reasons. Sunset clauses are legal provisions of corporate charters. Therefore lawyers usually have significant input into their design. One earlier study finds that, in the early 1990s, companies advised by Silicon Valley law firms in their IPOs exhibited a noticeable difference in their adoption of DCS, compared to their counterparts whose lawyers were from elsewhere (Coates, 2001). This finding is consistent with the view that lawyers are at least one determinant of dual-class structures. Our sample mainly covers the companies that went public since the second half of the 1990s, when Silicon Valley law firms had accumulated plenty of experience advising IPOs companies, especially high-tech firms. A more recent study further confirms the relevance of legal counsels—especially in Silicon Valley—in formulating DCS structures (Winden, 2018). Critically, legal counsels in IPOs are often determined long before firms start to design the details in their post-IPO share structures. Thus it is less likely for post-IPO performance and legal counsels to be correlated. For instance, Wilson Sonsini Goodrich &

Rosati, Google's IPO legal counsel in 2004, had advised Google since 1998, when Google was incorporated.[10] Third, if law firms advising IPOs can affect corporate values, it is unlikely that this influence comes from sources other than IPO legal documents, the ultimate products of lawyers' work in the IPO process. In this regard, the exclusivity condition required for IVs seems highly plausible.

Studies have used IPO legal counsel as an IV to identify the causal relationship between corporate governance design and firm value (Johnson, Karpoff, and Yi, 2015). To this end, we recognize the following Silicon Valley law firms with reputations for working with startups: Cooley, Fenwick & West; Wilson Sonsini Goodrich & Rosati; Morrison & Foerster; Gunderson Dettmer Stough Villeneuve Franklin & Hachigian; and Brobeck, Phleger & Harrison. There are 49 (25.79%) dual-class firms with Silicon Valley legal counsels and 409 (25.06%) single-class firms with these legal counsels. In the first stage, we estimate the likelihood of adopting sunset provisions, given that a firm's legal counsel is one of those Silicon Valley law firms, along with other firm-, founder-, year-, and industry-level characteristics. We then use the predicted sunset provision from the first stage to predict firm value in the second stage.

[Place Table VI about here]

Table VI presents the results from two-stage least-square (2SLS) regressions on firm value. Columns (1) and (2) present the results from the full sample, while columns (3) and (4) present the results from the DCS subsample. The dependent variables in the first stage are *DCS* (column 1) and *Sunset1, Sunset 2 and Sunset3* (column 3, 5, 7), respectively. The three sunset variables are defined in the same way as in Table V. In the second stage (columns 2, 4, 6, 8), the estimated values of these variables are used as

[10] "Law Firms Mine San Francisco for Internet Start-Up Gold" by Evelyn M. Rusli, *The New York Times*, October 1, 2012.

primary regressors while the dependent variable is *Q*. Control variables as well as other empirical specifications are the same as Table V.

In column (1) of Table VI, *Hierarchy* is positively associated with DCS: the point estimate is 0.078, which is statistically significant at 10%. This positive correlation is consistent with our proposition that founders from cultures that value hierarchy more than egalitarianism are more likely to adopt DCS in their firms. In addition, *SVCounsel* is positively correlated with all the three sunset variables, and their coefficients (0.182, 0.133, 0.076) are all statistically significant at 1%. As hypothesized, DCS firms are likely to have sunset provisions when they appoint Silicon Valley law firms as their IPO counsels.

Columns (2) of Table VI shows the second-stage result of regressing Tobin's *Q* on *DCS* that is instrumented by *Hierarchy* in the first-stage, where we find a statistically significant and positive estimate (0.449) on the instrumented DCS. This is very similar to the coefficient estimate in the OLS analysis in Table V. Consistent with the previous table, the results in Table VI support the notion that DCS can benefit newly listed firms. The benefit of having sunset provisions is more clearly pictured in columns (4), (6) and (8), where the IV regression is conducted for the DCS subsample. The coefficients of *Sunset1, Sunset2, Sunset3* are 0.854, 1.494, and 0.982, respectively, all being statistically significant at 1%. The sizes of the coefficients are about 2-3 times larger than that in the OLS analysis, which seem reasonable given that IV estimates the *local* average treatment effect induced by "compliers" which can be larger than the average treatment effect. These results indicate that firms with sunset provisions outperform those without such provisions within the DCS group.

One concern might be that *SVCounsel* as an IV is inadequate because our sample may have a geographical bias in the relationship between Silicon Valley law firms and high-tech companies. That is, DCS high-tech firms in our sample may have a higher likelihood of being represented by Silicon Valley law firms because these law firms are located near the high-tech firms' headquarters. To address this possible alternative explanation, we control the firms' headquarters. Based on each firm's headquarters written in its IPO prospectus, we construct a variable indicating whether a firm is located in the Silicon Valley region: *SVHQ*. The correlation between *SVHQ* and *SVCounsel* is only 0.3422, implying that geography is not the main factor driving our results. The positive and statistically significant relationship between sunset provisions and firm value remains, even after controlling for the firms' headquarters. In the first stage, the coefficients of *SVHQ* on DCS and sunset provisions are insignificantly negative, suggesting that firm location does not necessarily lead to the adoption of DCS or sunset provisions. This insignificant result supports our conjecture that IPO counsels, not firms in specific regions, influence the decision to adopt these share structures.

C. Different types of sunset

Bebchuk and Kastiel (2017) and Kim and Michaely (2019) advocate for time-based sunset, in relation to transfer-based sunsets which account for the majority of sunset clauses adopted by DCS firms, as the latter depend on the discretionary actions of superior class shareholders. However, Fisch and Davidoff-Solomon (2019) question the effectiveness of time-based sunset due to its one-size-fits-all nature and end-period problem, and suggests further exploration of other types of sunsets such as those based on the founder's death, incapacitation and departure (i.e., incapacity-based sunset). Therefore, we further test the effect of different types of sunset clause—time-based sunset, incapacity-based sunset, and transfer-based sunset—on Tobin's *Q* on the subsample of DCS firms. Table VII presents the results, with Columns (1)—(3) showing the coefficients for the three types of sunset, respectively, and Column (4) showing all of them together when put in the same regression. The baseline group consists of DCS firms without any sunset clause. We find that the positive and significant effect is concentrated in DCS firms with incapacity-based sunset. In untabulated tests, we also conduct similar 2SLS regressions using *SVCounsel* as an IV for each of the three sunset variables. However, it is important to note that while Silicon Valley legal counsels are more likely to design sunset clauses in general, they do not necessarily discriminate on the type of sunset. Therefore, while we find the coefficients of the three different sunsets are all positive and significant in the second stage of when entered into the 2SLS regression individually,[11] we do not take this as strong evidence that all sunsets are equally important. Instead, our OLS results are more consistent with the evidence in the law and finance literature.

These results first confirm the crucial role played by incapacity-based sunset in saving dual-class firms from the direst consequences when those who tightly control business operations hang on to their power even if they are unable to exercise it properly. Therefore, it seems that both sides of the sunset debate are in favor of incapacity-based sunset. In fact, both Bebchuk and Kastiel (2017) and Fisch and Davidoff-Solomon (2019) used mishap suffered by Viacom due to the incapacity of its controlling shareholder, Redstone, as a motivating case of their studies on sunsets. Incapacity-based sunset is also required by several Asian jurisdictions, including Hong Kong and China, when firms choose to go public with DCS. In addition, our findings do not bear out the advantages of time-based sunset hypothesized by Bebchuk and Kastiel (2017) although neither do they substantiate the potential detriments of this type of sunset proposed by Fisch and Davidoff-Solomon (2019). This being said, there are only 15% DCS firms in our sample have time-based sunset, lower than either of the other two types of sunsets. The limited number of observations prevent us from forming more conclusive views out of our empirical analysis. However, the small proportion of DCS firms voluntarily adopting time-based sunset does echo Bebchuk and Kastiel (2017)'s prediction that founders do not have

[11] We cannot conduct the 2SLS analysis with all the three types of sunset in the regression at the same time, because we only have one IV, which causes an underidentification problem.

the right incentive to remove DCS even if doing so could add to shareholders' public interest.

[Place Table VII about here]

D. Cross-sectional and time-series heterogeneities

The previous analyses indicate that our sample firms may have different characteristics from those reported in the literature. Indeed, many of the firms in our sample are classified as high-tech firms, which are not traditionally considered to have DCS structures. In this section, we explore whether the effects are indeed driven by the new species of a high-tech firm that is not well studied in the literature. We regress Tobin's Q on the interaction between *DCS* and an indicator that alternately captures whether the firm is in the high-tech sector (*HighTech*), went public after Google's IPO (*PostGoogle*), and had nonzero R&D expenditures (*R&D*). We again apply the IV approach to alleviate endogeneity concerns. In other words, *DCS* and *Sunset* are instrumented with *Hierarchy* and *SVCounsel*, respectively, in the same way as the previous analyses. Furthermore, to avoid the so-called forbidden regression problem, we also instrument the interaction terms between endogenous variables and *HighTech* with the interaction terms between IVs and *HighTech*.

We first show the results from regressing *Q* on the interaction between *DCS* or *Sunset* and *HighTech* in Table VIII. We find that the variables regarding sunset provisions have statistically significant and positive coefficients, which is particularly pronounced for high-tech firms. In column (1), the estimate of *DCS* × *HighTech* is positive (1.126), suggesting that high-tech firms, in a nutshell, are more likely to outperform when they go public with DCS than without. Their firm values are higher if they have time- or incapacity-based sunsets. In column (4), the estimate of *Sunset* × *HighTech* is significantly positive (0.852). These statistically positive relationships are observed in the matching sample (column 2) and 2SLS regressions (columns 3 and 5). Overall the results from Table VII provide a way to explain why a significant number of the recent high-tech unicorns went public with DCS and sunset clauses.

[Place Table VIII about here]

Next, we test whether there is a difference between the IPOs before Google's IPO and afterward by regressing *Q* on the interaction between *DCS* or *Sunset* and *PostGoogle*, as Google's IPO on August 19, 2004, was a monumental event that started the recent trend of high-tech unicorns of going public with DCS. Following Google's example, unicorns worldwide began to consider the adoption of DCS as part of their IPOs. Table IX presents the results, with Columns (1), (2), and (4) showing them for the OLS analysis (full sample and matched sample with *DCS* as the key explanatory variable and DCS subsample with *Sunset* as the key explanatory variable) and Columns (3) and (5) showing them for the IV-2SLS analysis, where *SVCounsel*, *Hierarchy*, and their interactions with *PostGoogle* are used as IVs. We find that DCS firms in the post-Google period tend to have a higher valuation than those that went public in the pre-Google period, especially when focusing on the 2SLS results. This is consistent with our discussion that the recent DCS differ structurally from their traditional counterparts. We also find a stronger relationship between DCS with sunset provisions and firm value in the post-Google period in the 2SLS result. Together with the result from the high-tech industries analysis, this result suggests that our sample DCS firms differ from the traditional DCS firms studied in the literature.

[Place Table IX about here]

We further investigate whether the role of DCS and sunset provision is more crucial for firms that rely more on innovation inputs by replacing *PostGoogle* with *R&D* (a binary indicator for whether the firm had R&D expenditures in a particular year). The results are presented in Table X. Both OLS results and 2SLS results show that DCS firms with

R&D expenditures are indeed higher valued than those without R&D and SCS firms, and, among DCS firms, those with sunset provisions have higher valuations. Collectively, results from these cross-sectional and time-series heterogeneity tests provide further assurance that the positive valuation effects of DCS are driven by the new-generation high-tech firms.

[Place Table X about here]

IV. Mechanisms

The previous tables show that dual-class IPOs with sunset provisions exhibit higher firm value in terms of Tobin's Q. A natural question is how this comes about. The key arguments for why DCS create value are that they ensure that the founder's human capital is fully deployed, and they insulate managers from short-term market pressures, enabling them to focus on long-term value creation (Cremers, Litov, and Sepe, 2017; Cremers et al., 2016). The key argument for why the sunset clause is crucial for value preservation is that it creates a check on corporate insiders, alleviating shareholders' concerns about managerial entrenchment (Kim and Michaely, 2019). Therefore, in this section, we test operating efficiency, innovation outputs, and managerial incentives as potential channels through which dual-class IPOs outperform.

A. Operating efficiency

First, if DCS allows a firm to fully deploy its founders' human capital through superior decision-making, the structure might lead to greater operating efficiency. Similarly, if a sunset provision can curb entrenchment, it might also improve decision-making and, thus, efficiency. This is essentially a cash flow channel. Specifically, we measure a firm's operating efficiency by its asset turnover and the marginal value of cash.

Asset turnover (*Turnover*) aims to capture the firm's operational productivity and is calculated as the net sales divided by the total assets. Table XI presents the results of regressing *Turnover* on *DCS* (Columns (1)–(3)) or on *Sunset* (Columns (4)–(5)). Columns (1)–(3) show the full-sample OLS results, matched sample OLS results, and full sample 2SLS results using *Hierarchy* as the IV for DCS, respectively. Columns (4)–(5) show OLS and 2SLS results, respectively, for the subsample of DCS firms only. Across the five columns, the coefficients of DCS and of Sunset are all positive and statistically significant, suggesting the firms with DCS and especially those with sunset do have greater operational productivity.

[Place Table XI about here]

We also test the marginal value of cash holdings, which has been documented to strongly predict various corporate financial outcomes, such as investment opportunities, financial constraints, and payout (Faulkender and Wang, 2006). Dittmar and Mahrt-Smith (2007) show that well-governed firms have a higher marginal value of cash holdings than poorly governed firms. Following previous studies, we measure the marginal value of cash holdings from the following regression model.

$$\begin{aligned} r_{i,t} - R^B_{i,t} = \quad & \gamma_0 + \gamma_1 \Delta CH_{i,t} + \gamma_2 \Delta E_{i,t} + \gamma_3 \Delta NA_{i,t} + \gamma_4 \Delta RD_{i,t} \\ & + \gamma_5 \Delta I_{i,t} + \gamma_6 \Delta D_{i,t} + \gamma_7 CH_{i,t-1} + \gamma_8 L_{i,t} + \gamma_9 NF_{i,t} \\ & + \gamma_{10} GOV + \gamma_{11} DCS^{\dagger} + \gamma_{12} DCS^{\dagger} \times \Delta CH_{i,t} + \epsilon_{i,t}, \end{aligned} \tag{1}$$

where r is the annualized stock return, R^B is the Fama and French (1993) size- and book-to-market- matched portfolio return, C is cash, E is earnings before extraordinary items, NA is the net assets, RD is R&D expenses, I is interest expenses, D is common dividends, L is the leverage (calculated as total debt divided by the sum of total debt and market capitalization), NF is the sum of new equity issuance and new debt issuance, GOV is measures of governance (C-Index and I-Index), $DCS^{\dagger}$ is alternately measured as whether a firm adopts dual-class shares (*DCS*) or whether a DCS firm adopts sunset clause (*Sunset*). All accounting items (except for L) on the right-hand side of Equation (2) are scaled by the market capitation $M_{i,t-1}$ in the previous year. Since the annualized abnormal return on the left-hand side is the spread $M_{i,t} - M_{i,t-1}$ divided by $M_{i,t-1}$, each coefficient is interpreted as the dollar change in value for a one-dollar change in the corresponding item. We particularly pay attention to γ_{12}, the coefficient of the interaction term between *DCS* (or *Sunset*) and the change in cash holdings over market capitalization. Table XII presents the results with a similar structure as that of Table VIII. We find that, across all columns, the coefficients of the interaction terms are positive and statistically significant, again confirming the conjecture that DCS and sunset adoptions enable firms to more fully deploy the founders' human capital and make better decisions, leading to greater operating efficiency.

[Place Table XII about here]

B. Innovation channel

A positive outcome of isolating insiders from market short-termism is that founders can be better incentivized to innovate, bringing substantial value to the firm in the long run. Therefore we investigate the innovation outputs of the DCS firms and those with sunset provisions, in terms of both the quantity and quality of innovation. For the quantity of innovation, we follow the literature and use the standard number count of patents filed by the company. For the quality of innovation, we use various measures representing different characteristics of innovation outcomes. Among these, we use the simple number of patents *ln(PT)*, calculated as the natural logarithm of total patents corresponding to a firm-year observation, and the quality-adjusted number of patents (Hirshleifer, Hsu, and Li, 2017; Kogan, Papanikolaou, Seru, and Stoffman, 2017). Specifically, we construct a logarithm of citation-weighted patent measure *ln(PCW)*, following Hirshleifer et al. (2017) and Kogan et al. (2017):

$$\ln(PCW) = \ln\left[1 + \sum_{j=1}^{n}\left(1 + \frac{C_j}{AC_j}\right)\right], \tag{2}$$

where n is the number of patents corresponding to a firm-year observation, C_j is the number of citations received by the patent j, and AC_j is the average number of citations received by all patents granted to the focal firm in the same year as patent j. The number of citations is scaled by the average citations for two reasons. First, patents granted in some years may receive more citations than other patents because of external factors, such as economic and technological developments. Second, patents granted earlier may be cited more as they have been exposed longer.

Other measures of innovation quality we use are originality and generality of innovation (Gao, Hsu, Li, and Zhang, 2020; Hsu, Tian, and Xu, 2014). An innovation has greater originality if it draws upon a more diverse array of knowledge, and it is considered to have greater generality if it is cited by a more diverse array of subsequent inventions. Following previous studies, we calculate each patent's originality as one minus the Herfindahl index of technological class distribution of all patents it cites. Then we calculate a firm-level measure of original innovation *Original* as the average of its patents issued during the year. Similarly, each patent's generality is calculated as one minus the Herfindahl index of technological class distribution of all patents that cite it. A firm-level general innovation measure, *General*, is the average of its patents issued during the year. Both *Original* and *General* indicate the qualitative importance of innovation that a firm creates.

In Panel A of Table XIII, we conduct regressions of *ln(PT)* on *DCS* and *Sunset,* along with other firm-year characteristics. We find a positive effect (β = 0.679) of *DCS* on *ln(PT)* in Column (1), suggesting that DCS firms, on average, are likely to produce more innovative outputs. The point estimates also suggest this positive effect tends to be stronger for the firms with sunset provisions, as shown by the coefficients (0.103) on *Sunset* in column (4). These results are consistent under the matching sample analysis and 2SLS regressions. Overall our results suggest that DCS with sunset provisions can enhance firm value, plausibly by allowing founders to innovate more effectively.

[Place Table XIII about here]

Panel B presents the regressions of *ln(PCW)*. Consistent with the previous table, Firms with DCS structures are more likely to produce high-quality innovation, as measured by a positive and statistically significant point estimate (0.706) in column (1). Analyses from the matching sample and 2SLS regressions show similar results (columns 2 and 3). Nevertheless, we find an interesting inconsistency between the two tables from the subsample of DCS firms. While *Sunset* has a positive coefficient on *ln(PT)* in the previous table, it has a negative one on *ln(PCW)* in this table. The difference between the two measures of innovation used as dependent variables is that *ln(PCW)* gives more weight to patents with many citations, suggesting that the negative coefficient on the table implies that the innovative outputs are many in number but weak in impact.

We then test *Original* and *General*, which indicate whether a firm succeeds in generating original inventions and in generating patents that can be broadly applicable. For both measures, a higher value indicates better performance in producing high-quality innovation. In Panel A of Table XIV, results regarding *Original* are presented. As predicted, firms with DCS structures tend to produce more original patents than firms without such structures (columns 1–3). On the other hand, we find a marginal difference in producing original inventions within DCS firms. DCS firms with sunset provisions generate relatively fewer original patents than those without sunset provisions. The 2SLS regression supports a hypothesis that DCS firms with sunset provisions do not innovate more than those without sunset provisions.

[Place Table XIV about here]

In Panel B, we use *General* as a dependent variable to investigate the applicability of patents produced by DCS firms. Similarly to the previous table, the coefficients are significantly positive in columns (1)–(3) but are significantly negative in columns (4) and (5). Patents produced by DCS firms are cited in a wide range of technological areas, implying that those patents are valuable in terms of their applications. However, this positive effect does not apply to DCS firms with sunset provisions. Compared with DCS firms without sunsets, patents produced by those with sunsets are cited by a narrower range of technological sectors, suggesting that applications of those patents are restricted to specific areas. Overall our results from four different innovation measures support the following propositions. (1) DCS firms produce more innovative outputs than firms without DCS. (2) On average, they also produce inventions of higher quality than firms without DCS structures. (3) Within the DCS group, those with sunsets are better at generating many but worse at generating high-quality patents.

C. CEO incentives

The previous analyses imply that one of the channels through which DCS firms are associated with higher firm values than non-DCS firms is innovation. Innovation requires risk-taking, considering that firms may not be able to obtain successful results from their R&D. Thus, if the recent DCS IPOs are highly valued due to their vigorous innovation, we should see an economic incentive for their management teams to take risks. We examine whether CEOs in DCS firms (and DCS firms with sunset provisions) are compensated differently from CEOs in non-DCS firms. To this end, we calculate *CEODelta* and *CEOVega* and use them as measures of CEO compensation.

First, Panel A of Table XV analyzes *CEODelta* in our sample. *CEODelta* indicates CEO's pay-performance sensitivity. A positive relationship between *DCS* and *CEODelta* suggests that CEOs in DCS firms are incentivized to manage their firms to perform better financially. The coefficients are positive and statistically significant in columns (1)–(3). Furthermore, among DCS firms, sunset provisions are positively associated with *CEODelta* (columns 4 and 5). These positive coefficients of *DCS* and *Sunset* on *CEODelta* imply that CEOs of the recent DCS IPOs are not firmly attached to the typical principal-agent relationship described in the literature. Instead, these CEOs can be better understood in the founder-manager framework.

[Place Table XV about here]

Next, we focus on the risk-taking preference of CEOs in our sample by using *CEOVega* in Panel B of Table XV. We find that CEOs in DCS firms are incentivized to take more risks, as indicated by the positive and statistically significant coefficients in columns (1)–(3). This positive relationship between *DCS* and *CEOVega* can at least partially explain why DCS firms are better at innovation, both in quantity and quality, and why those firms are highly valued in the market. Meanwhile, we find a statistically significant negative relationship between *Sunset* and *CEOVega* in columns (4) and (5). Since sunset provisions eventually remove the founder-managers' superior voting power, it is plausible that they feel closely monitored. As such, they may not take huge risks like their peers in DCS firms without sunsets. So one possible side effect of sunset provisions is that firms with them may not generate high-quality inventions.

In untabulated analyses, we also decompose the *Sunset* variable into time-based, incapacity-based and transfer-based, and conduct OLS analysis as well as 2SLS analysis using *SVCounsel* as an IV for the three sunset variables, respectively.[12] The results are largely consistent with the ones using a single sunset variable, except that the transfer-based sunset is positively correlated with innovation quality (citation-based patents as well as the originality and generality of patents) and CEO Vega. To the extent that

[12] These results are available upon request.

transfer-based sunset depends on the discretionary actions of superior class holder thus does not put a real disciplinary constraint on the founder, it may encourage corporate insiders' risk-taking behavior.

V. Conclusion

This paper empirically examines the recent trends toward the adoption of adopting dual-class shares worldwide. By manually collecting data on U.S. IPOs since 1996, we find that a significant number of firms have gone public with DCS and that many of them are in high-tech industries. Contrary to prior beliefs regarding the effects of the DCS, we show that these firms, particularly when the DCS structure has a sunset that mandates automatic conversion of DCS to single-class shares upon the death, incapacity, or departure of superior class shareholders, outperform non-DCS firms and DCS firms without sunset clauses in terms of market valuation as measured by Tobin's Q. DCS firms with sunset provisions have greater operating efficiency, marginal value of cash, and more innovation outputs (measured by the number of patents filed) but lower quality ones in terms of citations, originality, and generality of their patents. These results are in line with the incentive schemes provided to their executives: DCS firms with sunset provisions have greater Delta but lower Vega of their CEO compensation. Our results are robust to a matched sample analysis and using an instrumental variable approach, in which DCS and sunset adoption are instrumented by the founder's cultural trait regarding preference for hierarchical power and the appointment of a Silicon Valley legal counsels long before the IPO, respectively.

Our results provide a justification for the deregulation of listing requirements across stock exchanges globally with regard to share classes. In recent years, the Hong Kong, Singapore, and Shanghai stock exchanges have changed their listing rules to allow IPOs with dual-class shares, thus deviating from the longstanding one share, one vote principle. Our findings suggest that, for a specific type of firms, high-tech companies, the benefits of adopting dual-class shares can exceed their costs. It is therefore necessary to distinguish between the new generation of high-tech unicorns and traditional kinds of firms with dual-class shares, as the two groups' main reasons for going public with dual-class shares differ. Nevertheless, the costs of their dual structures do become higher as firms mature. Thus exchanges might limit the usage of dual-class shares by the inclusion of sunset clauses. With regard to which sunset clause to adopt, our results suggest the insufficiency of transfer-based sunset to address the concerns about the dual-class structure. Despite the large number of DCS firms adopting this type of sunset, it does not seem to benefit their value. This finding provides preliminary support to Bebchuk and Kastiel (2017) in terms of the irrelevance of transfer-based sunset. It also casts empirical doubt on the regulatory position taken by many jurisdictions outside the U.S. that have recently mandated transfer-based sunset with the introduction of DCS. However, it is also noteworthy that the benefits from sunset provisions come at the expense of innovation quality. By allowing sunset clauses in their firms, founder-managers accept a check on their decision-making, impeding high-risk, high-return investments.

Appendix

A. Information from IPO prospectuses

We collect the data on the recent U.S. IPOs from the SEC EDGAR System. An IPO prospectus is filed to the SEC with Form S-1 Registration Statement under the Securities Act of 1933. IPO prospectuses can be amended from time to time before taking effect officially. The amendments to Form S-1 are classified as S-1/A in the EDGAR System. We record the information on the final amended Form S-1 to obtain the most precise data about a firm's IPO. We check whether a firm has dual-class shares by reading the section titled "Description of Capital Stock" in the final S-1/A filing. For example, the final version of Google's IPO prospectus states the following.[13]

… Our certificate of incorporation provides that, upon the closing of the offering, we will have two classes of common stock: Class A common stock, which will have one vote per share, and Class B common stock, which will have ten votes per share… Holders of our Class A and Class B common stock have identical rights, except that holders of our Class A common stock are entitled to one vote per share and holders of our Class B common stock are entitled to ten votes per share…

We also collect the specification on sunset provisions from the same page in the final amendment to Form S-1. Groupon is an e-commerce marketplace that connects merchants to customers by offering goods and services at a discount. The company went public on November 4, 2011, with dual-class shares. Each share of Class B common stock was entitled to 150 votes per share, while each Class A share had one vote per share. In 2016, five years after its IPO, its Class A shares and Class B had converted to a single class of common stock via a time-based sunset provision. The dual-class shares in Groupon had an incapacity-based sunset provision too. In its final S-1/A filing, the company states the following.[14]

… Upon the death or permanent incapacity of a holder of Class B common stock who is a natural person, the Class B common stock held by that person or his or her permitted estate planning entities will convert automatically into Class A common stock… Our Class A common stock and Class B common stock will automatically convert into a single class

[13] "Amendment No. 4 to Form S-1 Registration Statement" by Google Inc., July 26, 2004
[14] "Amendment No. 7 to Form S-1 Registration Statement" by Groupon Inc., November 1, 2011

of common stock five years after the completion of this offering. Following the conversion, each share of common stock will have one vote per share and the rights of the holders of all outstanding common stock will be identical… As a result of the automatic conversion, our founders will have identical rights as all other stockholders…

Generally, an IPO prospectus includes information on the firm's founder. In case no founder is specified in Form S-1 and S-1/A filings, then we manually search the web to identify the founder. In many cases, the final version of a firm's IPO prospectus clearly states its founder under the management section. For example, Facebook's founder is specified as Mark Zuckerberg as in the following.[15]

… Mark Zuckerberg is our founder and has served as our CEO and as a member of our board of directors since July 2004. Mr. Zuckerberg has served as Chairman of our board of directors since January 2012…

Once a founder is identified, we search the web to track the founder's origin. More than two sources confirm that Zuckerberg's family is Ashkenazi Jewish and originated in Europe. Thus we classify Mark Zuckerberg as Jewish.

Last, we find the legal counsel regarding a firm's IPO from its IPO prospectus. The IPO legal counsel can be found generally in the section titled "Legal Matters." For example, Snap's IPO counsel was Cooley, which is one of the largest law firms in Silicon Valley. Snap is famous for its picture-based messaging application, Snapchat, which refused acquisition offers from Facebook and Google before it went public in 2017. Its IPO prospectus states the following.[16]

… Cooley LLP, Palo Alto, California, which has acted as our counsel in connection with this offering, will pass on certain legal matters with respect to U.S. federal law in connection with this offering…

[15] "Amendment No. 8 to Form S-1 Registration Statement" by Facebook Inc., May 16, 2012
[16] "Amendment No. 3 to Form S-1 Registration Statement" by Snap Inc., February 27, 2017

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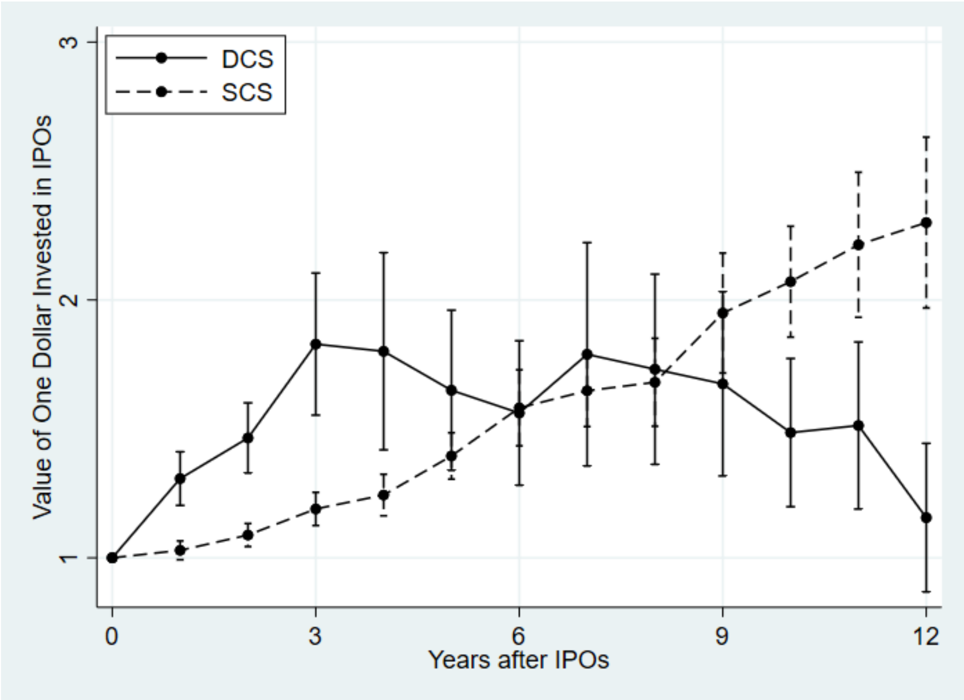

Figure 1. Life Cycle of DCS Firms
This figure shows the relative investment performance of IPOs with DCS. The solid line represents the average value of one dollar invested in IPOs with DCS. On the contrary, the dashed line represents the average value of one dollar invested in IPOs without DCS.

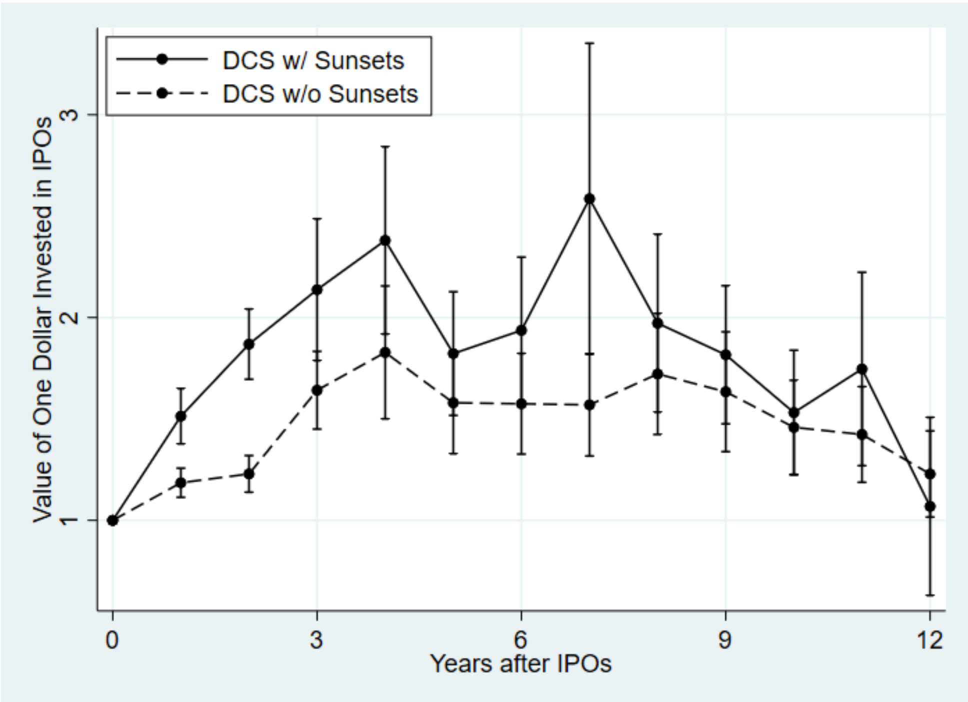

Figure 2. DCS Firms with Sunset Provisions
This figure shows the relative investment performance of DCS firms with sunset provisions after their IPOs. The solid line represents the average value of one dollar invested in DCS firms with sunset provisions. The dashed line represents the average value of one dollar invested in DCS firms without sunset provisions.

Table I. Variable Definition

This table reports the definition of each variable and its source.

Variable	Definition	Source
DCS	An indicator variable with a value of one if a firm has dual-class shares, and zero otherwise.	CII, Winden (2018), Manual collection from IPO prospectus
Sunset	An index with a value of zero if a DCS firm has neither time-based sunset nor incapacity-based sunset, one if a DCS firm has one of either time-based sunset or incapacity-based sunset, and two if a DCS firm has both time-based sunset and incapacity-based sunset.	Manual collection from IPO prospectus
SVCounsel	An indicator variable with a value of one if a firm's IPO legal counsel is one of the following Silicon Valley law firms: Cooley, Fenwick & West; Wilson Sonsini Goodrich & Rosati; Morrison & Foerster; Gunderson Dettmer Stough Villeneuve Franklin & Hachigian; and Brobeck, Phleger & Harrison.	Manual collection from IPO prospectus
Hierarchy	A score of preferring hierarchical culture to egalitarian culture in the origin country of a firm's founder.	World Value Survey
Q	Tobin's Q calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets.	Compustat
HighTech	Following Loughran and Ritter (2004), an indicator variable with a value of one if a firm has the following four-digit Standardized Industrial Classification (SIC) codes: 3571, 3572, 3575, 3577, 3578 (computer hardware), 3661, 3663, 3669 (communication equipment), 3671, 3672, 3674, 3675, 3677, 3678, 3679 (electronics), 3812 (navigation equipment), 3823, 3825, 3826, 3827, 3829 (measuring and controlling devices), 3841, 3845 (medical instruments), 4812, 4813 (telephone equipment), 4899 (communications services), and 7371, 7372, 7373, 7374, 7375, 7378, and 7379 (software). Otherwise, its value is zero.	Compustat, Manual collection from IPO prospectus
ln(PT)	The natural logarithm of one plus number of patents filed in a year.	
ln(PCW)	The natural logarithm of citation-weighted patents as in Eq. (2).	
Original	One minus the Herfindahl index of technological class distribution of all patents it cites, averaged at firm-level.	
General	One minus the Herfindahl index of technological class distribution of all patents that cite it, averaged at firm-level.	
CEODelta	CEO pay-performance sensitivity	Execucomp, CRSP
CEOVega	CEO wealth to stock volatility	Execucomp, CRSP
SVHQ	An indicator variable with a value of one if a firm's headquarters is located in Silicon Valley, and zero otherwise.	Manual collection from IPO prospectus
Delaware	An indicator variable with a value of one if a firm is incorporated in Delaware, and zero otherwise.	Compustat, Manual collection from IPO prospectus
NASDAQ	An indicator variable with a value of one if a firm is listed in NASDAQ, and zero otherwise.	Manual collection from IPO prospectus
C-Index	An index consists of the staggered board, the limitation on amending the charter, and supermajority approval for mergers.	ISS Governance, GMI, Manual collection from IPO prospectus
I-Index	An index consists of poison pills, golden parachutes, and the limitation on amending bylaws.	ISS Governance, GMI, Manual collection from IPO prospectus
ln(Assets)	The natural logarithm of total assets.	Compustat
Debt/Assets	Debt-to-assets ratio.	Compustat
ROA	Net income divided by total assets	Compustat
CapEx/Assets	Capital expenditure divided by total assets	Compustat
R&D/Sales	R&D expenditure divided by net sales	Compustat

Table II. Going Public with DCS

This table reports the number of IPOs in our sample for each year. The percentage of firms going public with or without DCS for a given year is shown in parentheses.

IPO Year	Dual-Class IPOs	Single-Class IPOs	Total
1996	18 (13.24%)	118 (86.76%)	136 (100.00%)
1997	9 (7.96%)	104 (92.04%)	113 (100.00%)
1998	7 (11.29%)	55 (88.71%)	62 (100.00%)
1999	20 (12.74%)	137 (87.26%)	157 (100.00%)
2000	8 (5.03%)	151 (94.97%)	159 (100.00%)
2001	1 (4.00%)	24 (96.00%)	25 (100.00%)
2002	4 (13.33%)	26 (86.67%)	30 (100.00%)
2003	3 (8.33%)	33 (91.67%)	36 (100.00%)
2004	6 (5.22%)	109 (94.78%)	115 (100.00%)
2005	5 (5.56%)	85 (94.44%)	90 (100.00%)
2006	3 (3.00%)	97 (97.00%)	100 (100.00%)
2007	4 (4.00%)	96 (96.00%)	100 (100.00%)
2008	1 (6.67%)	14 (93.33%)	15 (100.00%)
2009	2 (6.67%)	28 (93.33%)	30 (100.00%)
2010	3 (5.26%)	54 (94.74%)	57 (100.00%)
2011	6 (10.71%)	50 (89.29%)	56 (100.00%)
2012	8 (10.53%)	68 (89.47%)	76 (100.00%)
2013	8 (7.02%)	106 (92.98%)	114 (100.00%)
2014	7 (4.64%)	144 (95.36%)	151 (100.00%)
2015	10 (11.11%)	80 (88.89%)	90 (100.00%)
2016	7 (10.61%)	59 (89.39%)	66 (100.00%)
2017	19 (22.89%)	64 (77.11%)	83 (100.00%)
2018	15 (14.02%)	92 (85.98%)	107 (100.00%)
2019	16 (17.20%)	77 (82.80%)	93 (100.00%)
Total	190 (9.22%)	1871 (90.78%)	2061 (100.00%)

Table III. Summary Statistics

This table reports summary statistics. *DCS* is an indicating variable that takes a value of one if a firm has dual-class shares and zero otherwise. *Sunset* has a value of one if a firm has either incapacity or time-based sunset, two if it has both sunsets, and zero if it has none. *SVCounsel* is an indicator of whether a firm has a Silicon Valley legal counsel or not. *Delaware* indicates whether it is a Delaware-incorporated firm or not. *Hierarchy* indicates whether a founder has a hierarchical culture or an egalitarian culture. *Q* is Tobin's Q, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. *ln(PCW)* is the natural logarithm of patents weighted by the number of citations forward. *CEODelta* and *CEOVega* are CEO pay-performance sensitivity and CEO wealth to stock volatility, respectively (Coles *et al.*, 2006). *SVHQ* is an indicator variable with a value of unity if a firm's headquarters is located in Silicon Valley and zero otherwise. *NASDAQ* is a dummy variable indicating that a firm is listed in the NASDAQ market. *C-Index* is the number of a firm's takeover defenses among the staggered board, the limitation on amending charter, and supermajority approvals for mergers. *I-Index* counts the number of a firm's takeover defenses among poison pills, golden parachutes, and the limitation on amending bylaw. *ln(Assets)* is the natural logarithm of total assets. *Debt/Assets* is the debt-to-asset ratio. *ROA* is the return on assets, measured as the net income divided by the total assets. *CapEx/Assets* is calculated as the capital expenditure divided by the total assets. *R&D/Sales* is the R&D expenditure scaled by sales. All continuous variables are winsorized at 1% and 99%.

Variable	Obs.	Mean	Std. Dev.	Min.	Median	Max.
DCS	15150	0.113	0.316	0.000	0.000	1.000
Sunset1 (DCS firms only)	1710	0.357	0.581	0.000	0.000	2.000
Sunset2	1710	0.303	0.460	0.000	0.000	1.000
Sunset3	1710	0.924	0.265	0.000	1.000	1.000
Time-based sunset	1710	0.151	0.358	0.000	0.000	1.000
Incapacity-based sunset	1710	0.206	0.404	0.000	0.000	1.000
Transfer-based sunset	1710	0.920	0.271	0.000	1.000	1.000
SVCounsel	15150	0.229	0.420	0.000	0.000	1.000
Hierarchy	15150	1.979	0.066	1.785	1.957	2.213
Q	15150	2.835	2.439	0.604	2.013	14.961
HighTech	15150	0.349	0.477	0.000	0.000	1.000
ln(PT)	15150	0.500	1.014	0.000	0.000	7.206
ln(PCW)	15150	0.642	1.259	0.000	0.000	5.174
Original	15150	0.096	0.194	0.000	0.000	0.817
General	15150	0.065	0.159	0.000	0.000	0.814
CEODelta	15150	210.426	850.378	0.000	0.000	6704.446
CEOVega	15150	18.201	62.815	0.000	0.000	445.150
SVHQ	15150	0.115	0.319	0.000	0.000	1.000
Delaware	15150	0.882	0.323	0.000	1.000	1.000
NASDAQ	15150	0.750	0.433	0.000	1.000	1.000
C-Index	15150	1.285	0.819	0.000	1.000	3.000
I-Index	15150	1.397	0.914	0.000	2.000	3.000
ln(Assets)	15150	5.783	1.664	1.999	5.692	10.084
Debt/Assets	15150	0.221	0.263	0.000	0.121	1.266
ROA	15150	-0.147	0.361	-1.974	-0.011	0.299
CapEx/Assets	15150	0.047	0.061	0.000	0.026	0.352
R&D/Sales	15150	1.617	7.750	0.000	0.032	63.829

Table IV. Matching Sample

This table shows the result of matching. DCS IPOs are matched to non-DCS IPOs with the same IPO years, same industries, and the closest market capitalizations. *Q* is Tobin's Q, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. *ln(PCW)* is the natural logarithm of patents weighted by the number of citations forward. *CEODelta* and *CEOVega* are CEO pay-performance sensitivity and CEO wealth to stock volatility, respectively (Coles *et al.*, 2006). *SVHQ* is an indicator variable with a value of unity if a firm's headquarters is located in Silicon Valley and zero otherwise. *NASDAQ* is a dummy variable indicating that a firm is listed in the NASDAQ market. *C-Index* is the number of a firm's takeover defenses among the staggered board, the limitation on amending charter, and supermajority approvals for mergers. *I-Index* counts the number of a firm's takeover defenses among poison pills, golden parachutes, and the limitation on amending bylaw. *ln(Assets)* is the natural logarithm of total assets. *Debt/Assets* is the debt-to-asset ratio. *ROA* is the return on assets, measured as the net income divided by the total assets. *CapEx/Assets* is calculated as the capital expenditure divided by the total assets. *R&D/Sales* is the R&D expenditure scaled by sales. All values are measured at the end of the IPO years. Columns (1) and (2) show the number of observations and their mean values for DCS IPOs, while columns (3) and (4) show the number of observations and their mean values for matched non-DCS IPOs. Columns (5) and (6) report the results of the *t*-test between two groups. * indicates statistical significance at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)
	DCS IPOs		Matched non-DCS IPOs			
Variable	Obs.	Mean	Obs.	Mean	Diff.	Std. Err.
Q	190	3.652	190	3.689	-0.037	(0.357)
HighTech	190	0.389	190	0.453	-0.063	(0.051)
ln(PT)	190	0.379	190	0.239	0.140	0.091
ln(PCW)	190	0.532	190	0.325	0.206	(0.119)
Original	190	0.055	190	0.043	0.012	0.015
General	190	0.042	190	0.037	0.005	0.013
CEODelta	190	171.556	190	107.483	64.073	(112.425)
CEOVega	190	0.109	190	0.235	-0.126	(0.207)
SVHQ	190	0.074	190	0.105	-0.032	(0.029)
Delaware	190	0.879	190	0.858	0.021	(0.035)
NASDAQ	190	0.579	190	0.668	-0.089	(0.050)
C-Index	190	1.768	190	1.951	-0.182	(0.160)
I-Index	190	1.589	190	1.486	0.103	(0.097)
ln(Assets)	190	7.144	190	6.685	0.460*	(0.197)
Debt/Assets	190	0.291	190	0.277	0.015	(0.031)
ROA	190	-0.059	190	-0.109	0.050	(0.028)
CapEx/Assets	190	0.050	190	0.057	-0.008	(0.006)
R&D/Sales	190	0.145	190	0.280	-0.136	(0.072)

Table V. Dual-Class Shares, Sunsets, and Firm Value

This table presents the results from OLS regressions on firm value. The dependent variable is *Q*, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. *DCS* is an indicating variable that takes a value of one if a firm has dual-class shares and zero otherwise. *Sunset1* is an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0-2. *Sunset2* is a binary indicator for whether the firm has any time- or incapacity-based sunset provisions. *Sunset3* is a binary indicator for whether the firm has any sunset provisions. *C-Index* is the number of a firm's takeover defenses among the staggered board, the limitation on amending charter, and supermajority approvals for mergers. *I-Index* counts the number of a firm's takeover defenses among poison pills, golden parachutes, and the limitation on amending bylaw. *Delaware* indicates whether a firm is incorporated in Delaware or not. *NASDAQ* is a dummy variable indicating that a firm is listed in the NASDAQ market. *SVHQ* is an indicator variable with a value of unity if a firm's headquarters is located in Silicon Valley and zero otherwise. *ln(Assets)* is the natural logarithm of total assets. *Debt/Assets* is the debt-to-asset ratio. *ROA* is the return on assets, measured as the net income divided by the total assets. *CapEx/Assets* is calculated as the capital expenditure divided by the total assets. *R&D/Sales* is the R&D expenditure scaled by sales. All Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. Robust standard errors are clustered at the firm level. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1) Full Sample	(2) Matched Sample	(3) DCS Subsample	(4) DCS Subsample	(5) DCS Subsample
DCS	1.001***	0.468*			
	(0.2884)	(0.2452)			
Sunset1			0.268*		
			(0.1503)		
Sunset2				0.396**	
				(0.1918)	
Sunset3					0.195
					(0.3113)
C-Index	-0.086	0.185**	0.286**	0.279**	0.289**
	(0.0917)	(0.0862)	(0.1168)	(0.1169)	(0.1178)
I-Index	0.110	-0.254***	-0.410***	-0.411***	-0.393***
	(0.0818)	(0.0792)	(0.1098)	(0.1098)	(0.1109)
Delaware	0.290	0.425**	0.906***	0.938***	0.916***
	(0.1970)	(0.1713)	(0.2650)	(0.2650)	(0.2652)
NASDAQ	-0.454***	-0.149	-0.318*	-0.300	-0.329*
	(0.1689)	(0.1307)	(0.1851)	(0.1854)	(0.1854)
SVHQ	0.268	0.511**	0.382	0.379	0.326
	(0.2041)	(0.2260)	(0.3719)	(0.3713)	(0.3710)
ln(Assets)	-0.662***	-0.295***	-0.329***	-0.328***	-0.334***
	(0.0486)	(0.0443)	(0.0603)	(0.0602)	(0.0604)
Debt/Assets	2.112***	0.828***	-0.445	-0.423	-0.489
	(0.1508)	(0.1669)	(0.3024)	(0.3030)	(0.3022)
ROA	-0.863***	0.359*	-0.328	-0.327	-0.344
	(0.0825)	(0.2068)	(0.3166)	(0.3164)	(0.3168)
CapEx/Assets	3.228***	4.755***	6.754***	6.936***	6.649***
	(1.0593)	(1.0144)	(1.8301)	(1.8352)	(1.8345)
R&D/Sales	0.000	-0.001	0.007	0.007	0.007
	(0.0002)	(0.0022)	(0.0092)	(0.0092)	(0.0093)
Industry-FE	Yes	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes
Obs.	13067	2555	1518	1518	1518
Adj. R^2	0.077	0.226	0.273	0.273	0.271

Table VI. Instrumental Variable Analyses

This table presents the results from 2SLS regressions on firm value, where *SVCounsel* and *Hierarchy* are used as IVs. *SVCounsel* is an indicator of whether a firm has a Silicon Valley legal counsel or not. *Hierarchy* is a score of preferring hierarchy than egalitarianism from the culture of the founder. Columns (1)-(2) present the results from the full sample while columns (3)-(8) present the results from DCS subsample. In the first stage (columns 1 and 3), the dependent variables are *DCS* in column (1), *Sunset1* in column (3), *Sunset2* in column (5), and *Sunset3* in column (7), respectively. *DCS* is an indicating variable that takes a value of one if a firm has dual-class shares and zero otherwise. *Sunset1* is an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0-2. *Sunset2* is a binary indicator for whether the firm has any time- or incapacity-based sunset provisions. *Sunset3* is a binary indicator for whether the firm has any sunset provisions. In the second stage (columns 2, 4, 6 and 8), the estimated values of these variables are used as primary regressors while the dependent variable is *Q*, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. Control variables are the same as those in Table V, and are included with one-year lag in both stages of the regression. Industry-fixed and year-fixed effects are included in all specifications. Robust standard errors are clustered at the firm level. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full Sample		DCS Subsample		DCS Subsample		DCS Subsample	
	1st Stage *DCS*	2nd Stage *Q*	1st Stage *Sunset1*	2nd Stage *Q*	1st Stage *Sunset2*	2nd Stage *Q*	1st Stage *Sunset3*	2nd Stage *Q*
DCS		0.449**						
		(0.1818)						
Sunset1				0.854***				
				(0.1209)				
Sunset2						1.494***		
						(0.1985)		
Sunset3								0.982***
								(0.1982)
Hierarchy	0.078*							
	(0.0456)							
SVCounsel			0.182***		0.133***		0.076***	
			(0.0414)		(0.0324)		(0.0200)	
C-Index	-0.052***	-0.138	0.049**	0.247**	0.051***	0.050	0.051***	0.045
	(0.0038)	(0.0911)	(0.0202)	(0.1150)	(0.0159)	(0.1192)	(0.0098)	(0.1265)
I-Index	0.024***	0.115	0.028	-0.467***	0.022	-0.487***	-0.049***	-0.231**
	(0.0034)	(0.0816)	(0.0191)	(0.1084)	(0.0149)	(0.1084)	(0.0092)	(0.1144)
Delaware	0.002	0.279	0.024	0.806***	-0.065*	1.104***	-0.002	0.921***
	(0.0083)	(0.1973)	(0.0461)	(0.2612)	(0.0361)	(0.2613)	(0.0223)	(0.2630)
NASDAQ	-0.029***	-0.462***	-0.027	-0.299	-0.066***	-0.177	0.024	-0.453**
	(0.0071)	(0.1691)	(0.0321)	(0.1822)	(0.0252)	(0.1828)	(0.0156)	(0.1855)
SVHQ	-0.035***	0.234	-0.220***	0.647*	-0.141***	0.895**	-0.004	0.465
	(0.0086)	(0.2041)	(0.0644)	(0.3676)	(0.0505)	(0.3717)	(0.0312)	(0.3690)
ln(Assets)	0.043***	-0.609***	-0.033***	-0.269***	-0.023***	-0.232***	-0.015***	-0.287***
	(0.0020)	(0.0480)	(0.0105)	(0.0600)	(0.0082)	(0.0607)	(0.0051)	(0.0605)
Debt/Assets	-0.008	2.119***	-0.195***	-0.144	-0.185***	0.354	-0.083***	-0.067
	(0.0063)	(0.1510)	(0.0531)	(0.3000)	(0.0416)	(0.3164)	(0.0257)	(0.3111)
ROA	-0.016***	-0.883***	-0.024	-0.233	-0.017	-0.022	0.022	-0.224
	(0.0035)	(0.0825)	(0.0553)	(0.3119)	(0.0433)	(0.3137)	(0.0267)	(0.3151)
CapEx/Assets	-0.261***	2.939***	-0.743**	5.367***	-0.960***	7.421***	-0.480***	6.674***
	(0.0445)	(1.0587)	(0.3172)	(1.8058)	(0.2485)	(1.7976)	(0.1534)	(1.8135)
R&D/Sales	-0.000	0.000	-0.000	0.011	-0.000	0.010	-0.000	0.009
	(0.0000)	(0.0002)	(0.0016)	(0.0091)	(0.0013)	(0.0091)	(0.0008)	(0.0092)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	13079	13079	1518	1518	1518	1518	1518	1518
Adj. R^2	0.198	0.078	0.313	0.301	0.336	0.298	0.209	0.283

Table VII. Different Types of Sunset Provisions

This table presents the results from OLS regressions on firm value on a subsample of DCS firms. The dependent variable is *Q*, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. The key explanatory variables are binary indicators for whether a firm adopts a time-based sunset (*Time*, column 1), an incapacity-based sunset (*Incapacity*, column 2), a transfer-based sunset (*Transfer*, column 3). Column 4 includes all the three indicators in the same regression. Control variables are the same as those in Table V and are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. Robust standard errors are clustered at the firm level. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)
	DCS Subsample	DCS Subsample	DCS Subsample	DCS Subsample
Time	-0.273			-0.374
	(0.2607)			(0.2616)
Incapacity		0.622***		0.636***
		(0.1978)		(0.2000)
Transfer			0.309	0.227
			(0.3032)	(0.3044)
Controls	Yes	Yes	Yes	Yes
Industry-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
Obs.	1518	1518	1518	1518
Adj. R^2	0.271	0.276	0.271	0.276

Table VIII. Dual-Class Shares in High-Tech Industries

This table examines the effects of *DCS* and *Sunset* on *Q* in high-tech industries. *Q* is a measure of firm value, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. *HighTech* is an indicating variable that takes one if a firm is in high-tech industries (Loughran and Ritter, 2004). In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.673***	0.097	0.211		
	(0.2518)	(0.1541)	(0.1818)		
DCS × *HighTech*	1.126**	0.997***	1.760***		
	(0.4370)	(0.2412)	(0.3637)		
Sunset				-0.107	0.080
				(0.2049)	(0.2154)
Sunset × *HighTech*				0.852***	4.804***
				(0.3018)	(0.6610)
HighTech	0.298	0.053	0.105	0.080	-0.350
	(0.3618)	(0.2769)	(0.3547)	(0.3959)	(0.3440)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.083	0.253	0.083	0.309	0.361
Adj. R^2	0.078	0.232	0.077	0.276	0.327

Table IX. Dual-Class Shares after Google IPO

This table examines the effects of *DCS* and *Sunset* on *Q* after Google's IPO. *Q* is a measure of firm value, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. *PostGoogle* is an indicating variable that takes one if a firm went public after Google's IPO. In Columns (1)—(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.741***	0.094	1.464		
	(0.2871)	(0.1727)	(1.1601)		
DCS × *PostGoogle*	0.583	0.737***	0.580**		
	(0.4036)	(0.2388)	(0.2445)		
Sunset				-0.147	1.009**
				(0.3224)	(0.3901)
Sunset × *PostGoogle*				0.411	1.099*
				(0.3814)	(0.6292)
PostGoogle	0.260	-0.161	0.136	0.772	-0.810
	(0.2080)	(0.4675)	(0.3128)	(0.5459)	(0.7697)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.083	0.250	0.085	0.311	0.329
Adj. R^2	0.078	0.229	0.079	0.278	0.297

Table VIII. Dual-Class Shares and R&D Expenditure

This table examines the effects of *DCS* and *Sunset* on *Q* for firms with R&D expenditure. *Q* is a measure of firm value, calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets. In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.316	0.067	1.668		
	(0.2416)	(0.2619)	(1.1699)		
DCS × *R&D*	1.565***	0.742*	0.919***		
	(0.4788)	(0.4454)	(0.1726)		
Sunset				-0.228	0.059
				(0.3125)	(0.2268)
Sunset × *R&D*				1.406**	0.763***
				(0.5964)	(0.2197)
R&D	-0.092	0.952***	-0.506	0.927*	1.192***
	(0.6028)	(0.3420)	(1.0244)	(0.5240)	(0.2721)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.084	0.269	0.087	0.330	0.336
Adj. R^2	0.078	0.248	0.082	0.299	0.305

Table IXI. Dual-Class Shares and Operational Efficiency

This table presents the results from regressions on asset turnover *AT*, calculated as net sales divided by total assets. In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.105***	0.233**	0.053**		
	(0.0210)	(0.1174)	(0.0253)		
Sunset				0.145***	0.113*
				(0.0386)	(0.0598)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.337	0.521	0.336	0.536	0.533
Adj. R^2	0.333	0.507	0.332	0.515	0.511

Table XI. Dual-Class Shares and Marginal Value of Cash Holdings

This table presents the results from analyzing the role of the marginal value of cash holding, by regressing $r - R^B$ (the difference between annualized stock return and the Fama-French (1993) size and book-to-market matched portfolio return) on a set of control variables as well as the interaction of DCS (or Sunset) and the change in cash holdings, ΔCH. Following Faulkender and Wang (2006) and Dittmar and Mahrt-Smith (2007), control variables include earnings before extraordinary items *E*, net assets *NA*, R&D expenses *RD*, interest expenses *I*, common dividends *D*, leverage *L*, new financing *NF*, and cash holdings *CH*. These variables are scaled by the market capitalization *M* in the last year, except leverage *L*. In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.066*	0.073**	-0.044		
	(0.0397)	(0.0319)	(0.0338)		
DCS × *ΔCH*	0.520***	0.483***	0.172***		
	(0.1620)	(0.1369)	(0.0646)		
Sunset				-0.067*	-0.003
				(0.0378)	(0.0539)
Sunset × *ΔCH*				0.438*	0.504*
				(0.2473)	(0.2924)
ΔCH	0.710***	1.006***	0.917***	0.829***	0.856**
	(0.0310)	(0.0907)	(0.1923)	(0.1309)	(0.3361)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.091	0.197	0.102	0.278	0.279
Adj. R^2	0.086	0.175	0.097	0.244	0.245

Table XII. Dual-Class Shares, Sunsets, and Innovative Outputs in Quantity

This table presents the results from regressions on *ln(PT)*, the logarithm of total patents. In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

Panel A: Dependent variable is innovation quantity (# of patents)

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.679***	0.994***	0.072*		
	(0.2162)	(0.2468)	(0.0413)		
Sunset				0.103**	0.310***
				(0.0513)	(0.1053)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.360	0.594	0.342	0.696	0.725
Adj. R^2	0.348	0.550	0.329	0.641	0.674

Panel B: Dependent variable is innovation quality (citation-weighted patents)

	(1) OLS Full Sample	(2) OLS Matched Sample	(3) 2SLS Full Sample	(4) OLS DCS Subsample	(5) 2SLS DCS Subsample
DCS	0.706***	0.960***	0.134*		
	(0.2320)	(0.2836)	(0.0731)		
Sunset				-0.229***	-0.326*
				(0.0601)	(0.1661)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R2	0.301	0.529	0.289	0.507	0.507
Adj. R2	0.288	0.478	0.275	0.484	0.485

Table XII. Dual-Class Shares, Sunsets, and the Nature of Innovation

This table presents the results from regressions on innovation quality. In Panel A, the dependent variable is *Original*, a measure of the overall originality of a firm's patents portfolio. A patent's originality score is calculated as one minus the Herfindahl Index of the three-digit technology class distribution of all the patents it cites. A higher originality score indicates that the patent draws upon a more diverse array of existing knowledge. In Panel B, the dependent variable is *General*, a measure of the overall generality of a firm's patents portfolio. A patent's generality score is calculated as one minus the Herfindahl Index of the three-digit technology class distribution of all the patents that cite it. A higher generality score indicates that the patent is being drawn upon by a more diverse array of subsequent inventions. In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are the same as those in Table V and are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. Robust standard errors are clustered at the firm level. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

Panel A: Dependent variable is innovation originality (*Original*)					
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	OLS	2SLS
	Full Sample	Matched Sample	Full Sample	DCS Subsample	DCS Subsample
DCS	0.025**	0.023***	0.016***		
	(0.0123)	(0.0069)	(0.0056)		
Sunset				-0.009	-0.024**
				(0.0079)	(0.0109)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.234	0.352	0.234	0.474	0.476
Adj. R^2	0.229	0.333	0.229	0.450	0.451

Panel B: Dependent variable is innovation generality (*General*)					
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	OLS	2SLS
	Full Sample	Matched Sample	Full Sample	DCS Subsample	DCS Subsample
DCS	0.020**	0.014**	0.008*		
	(0.0092)	(0.0060)	(0.0043)		
Sunset				-0.014**	-0.022**
				(0.0069)	(0.0094)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R2	0.210	0.302	0.209	0.415	0.416
Adj. R2	0.205	0.282	0.204	0.388	0.389

Table XIII. Dual-Class Shares, Sunsets, and CEO Delta

This table presents the results from regressions on CEO pay-for-performance sensitivity. In Panel A, the dependent variable is *CEODelta*, which measures the sensitivity of CEO's total compensation to the firm's stock price. In Panel B, the dependent variable is CEOVega, which measures the sensitivity of CEO's total compensation to the firm's stock return volatility. In Columns (1)-(3), the key explanatory variable is *DCS*, a binary indicator for whether a firm has dual-class shares or not, and they show the results from OLS estimation on the full sample and the matched sample, and the 2SLS estimation (using *Hierarchy* as an IV for *DCS*) on the full sample, respectively. In Columns (4)—(5), the key explanatory variable is *Sunset,* an indicator for the number of time- and incapacity-based sunset provisions and takes an integral value of 0—2, and they show the OLS estimation and the 2SLS estimation (using *SVCounsel* as an IV for *Sunset*) on the subsample of DCS firms, respectively. Control variables are the same as those in Table V and are lagged for one year. Industry-fixed and year-fixed effects are included in all specifications. Robust standard errors are clustered at the firm level. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

Panel A: Dependent variable is the Delta of CEO compensation					
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	OLS	2SLS
	Full Sample	Matched Sample	Full Sample	DCS Subsample	DCS Subsample
DCS	541.294***	533.119*	664.845***		
	(177.5317)	(311.9012)	(235.8844)		
Sunset				275.260*	197.801**
				(162.8390)	(87.6099)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R^2	0.189	0.294	0.191	0.183	0.244
Adj. R^2	0.175	0.246	0.177	0.144	0.209

Panel B: Dependent variable is the Vega of CEO compensation					
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	OLS	2SLS
	Full Sample	Matched Sample	Full Sample	DCS Subsample	DCS Subsample
DCS	42.634***	36.712*	34.600***		
	(8.8451)	(18.8553)	(9.8750)		
Sunset				-17.597***	-10.983*
				(4.7680)	(6.5558)
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effect	Yes	Yes	Yes	Yes	Yes
Obs.	13079	2557	13079	1518	1518
R2	0.175	0.251	0.168	0.298	0.293
Adj. R2	0.160	0.200	0.154	0.265	0.260

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

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