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Initial Public Offering and Optimal Corporate Governance

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Choi, Albert H., "Initial Public Offering and Optimal Corporate Governance" (2022). *Law & Economics Working Papers*. 219.

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Initial Public Offering and Optimal Corporate Governance

Albert H. Choi*

February 20, 2022

Abstract

This paper examines the long-standing debate over whether firms have a market-based incentive to adopt optimal governance provisions at their initial public offering (IPO). Various scholars and practitioners have argued that firms that offer stock to the public with suboptimal governance structure will be penalized by the market through a lower IPO price. At the same time, others have documented empirical evidence that many IPO firms have putatively suboptimal governance provisions, such as anti-takeover provisions and dual class structure, and many, especially those with dual-class structure, enjoy a market premium at their IPO. This paper attempts to bridge this gap. The paper's main argument is that when different firms have different sets of optimal governance features (firm heterogeneity) and the investors have incomplete information on which governance features are optimal for which firms (informational issues), it becomes likely that the IPO process will not accurately price the governance arrangements. Due to such market failure, the incentive to adopt the (firm-specific) optimal governance provisions will diminish and firms with similar visible characteristics can adopt similar governance features even though they may be suboptimal for some firms. After presenting the baseline thesis, the paper examines various private ordering and regulatory mechanisms that could mitigate this market failure, such as a verification using a costly underwriter, more reliance on internal capital markets, deliberate underpricing, and potential post-IPO liability. The paper also presents some positive and normative implications, such as empirical predictions as to when we may expect to observe better pricing of governance regimes and the proposal over sunset provisions on dual class stock structure that convert dual-class to single-class stock after the IPO.

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Introduction

Do companies adopt optimal governance arrangements when they go public? This question has been one of the hotly debated topics in corporate law and governance. At the time of the initial public offering (IPO), a company offers a package of governance arrangements to the outside investors. The arrangements include: dual versus single class structure, staggered or un-staggered board, an exclusive forum provision (with respect to either corporate law or federal securities law claims), and robust or narrow shareholders' rights with respect to nominating directors, calling special shareholders' meeting, or having access to the company's proxy.¹ Presumably, when a company offers a set of governance features that the investors find unattractive, investors will discount the stock. Given that the companies want to maximize the proceeds from the initial public offering,² they would do better by switching to governance provisions that the investors would find more attractive.³ If, for instance, having a dual class stock structure would lower the price the outside investors would be willing to pay for the stock, the companies would be better off by adopting a single class stock structure and increasing the proceeds from the offering.

Based on this relatively simple, yet powerful, narrative, scholars and practitioners have argued that even controversial governance arrangements—such as a dual class capital structure, staggered board, or a mandatory individual arbitration provision⁴—should not be banned across

¹ These arrangements are typically included in the company's charter or bylaws. With respect to features such as dual class capital structure, staggered board, or right to call special shareholders' meeting, state corporate law expressly allows (or requires) them to be included in the company's governing documents. With respect to the issue of whether they can include a mandatory arbitration (or other forum) provision with respect to federal securities (and not state corporate) claims, the Delaware Supreme Court has recently expressly allowed Delaware companies to adopt a federal forum provision. See Dhruv Aggarwal, Albert H. Choi, and Ofer Eldar, *Federal Forum Provisions and the Internal Affairs Doctrine*, 10 *Harvard Business Law Review* 383 (2020); Joseph Grundfest, *The Limits of Delaware Corporate Law: Internal Affairs, Federal Forum Provisions, and Sciabaccuchi*, 75 *Business Lawyer* 1319 (2019-2020) (arguing that Delaware Chancery Court's decision in *Sciabaccuchi* is in conflict with controlling US and Delaware court precedents; and William Chandler, Joseph Grundfest, Virginia Milstead, and Peter Morrison, *FAQs Re: FFPs Frequently Asked Questions about Federal Forum Provisions*, 2021 *Columbia Business Law Review* 569 (2021) (discussing more recent developments surrounding federal forum provisions).

² The assumption that an IPO company wants to maximize the proceeds from the offering relies on the assumption that those who are offering to sell the stock (including the founders and other pre-IPO shareholders, such as venture capital investors) want to maximize the value of the stock that they retain and also minimize the number of stock that needs to be sold so as to satisfy the financing needs. At the same time, to the extent that they also desire to keep their private benefits, so long as the market is efficient, their choice will maximize the combination of the company valuation and the value of the private benefits.

³ See Frank Easterbrook and Daniel Fischel, *The Corporate Contract*, 89 *Columbia Law Review* 1416, 1418 (1989) (stating that “no one set of terms will be best for all; hence the ‘enabling’ structure of corporate law”); Frank Easterbrook and Daniel Fischel, *The Economic Structure of Corporate Law* 204-205 (1991) (stating that “if investors value [an antitakeover provision]...it should be included in the articles of incorporation or securities as firms go public”); and Lucian Bebchuk, *The Debate on Contractual Freedom in Corporate Law* 89 *Columbia Law Review* 1395 (1989) (examining to what extent corporations should have the “contractual freedom” to make their own governance arrangements). According to the article, “the price investors will be willing to pay for stock in an initial offering will generally reflect the initial charter provision, and the party designing the charter will take this into account. Charter provisions will consequently tend to be the efficient, value-maximizing provisions.” *Id.* at 1404.

⁴ See Hal Scott and Leslie Silverman, *Stockholder Adoption of Mandatory Individual Arbitration for Stockholder Disputes*, 36 *Harvard Journal of Law and Public Policy* 1187 (2013) for a more detailed argument on mandatory

the board, but instead be left up to the companies to decide when they go public. An underlying premise of the argument seems to be that each firm's package of optimal governance features may differ, or it is difficult for the regulator (such as the SEC) to determine which features are suboptimal, and the outside investors, if they find these features unattractive, can simply decide not to purchase or pay less for the stock. The initial public offering market, in short, can function as a "market check" against suboptimal or inefficient governance package.

On the other side of the debate, the optimal governance at initial public offerings theory has been subject to various criticisms. Some have argued that the IPO market does not function as well as other markets, such as secondary stock markets, where information presumably gets impounded into the stock price more easily. Unlike companies, whose stock has been trading on the market for a long time and who has been making numerous public disclosures over the years, companies that are going public for the first time are unknown commodities from the outside investors' perspective.⁵ Well-documented empirical evidence that the IPO market is prone to underpricing in the short-run and overpricing in the long run has also been used as an indicator that the market isn't functioning as well as other financial markets.⁶ When the IPO market exhibits such symptoms of imperfection, one could argue that there is no guarantee that the IPO process

individual arbitration provision. So far, both the SEC and the Delaware Legislature have been against allowing companies to adopt an individual mandatory arbitration provision in their governing documents. See also Hal Scott, *The SEC's Misguided Attack on Shareholder Arbitration*, *The Wall Street Journal*, February 21, 2019. In 2012, the Carlyle group attempted to impose individual mandatory arbitration clause at its IPO but, under pressure from both the SEC and the investors, it withdrew its proposal. See Ann Lipton, *The Carlyle Group Tries to Bar Investors from Court*, *The Advocate for Institutional Investors* (Summer 2012). Several US Senators even sent a letter to the SEC Chairman Schapiro to oppose the inclusion of individual mandatory arbitration provision. Al Franken, Richard Blumenthal, and Robert Menendez, *Letter to the SEC Chairman Schapiro*, February 3, 2012. See also DGCL §115 (banning mandatory arbitration in charters and bylaws in resolving corporate law disputes). At the same time, at least Delaware companies can adopt (through a unilateral board action on bylaw amendment) both an exclusive forum provision (on corporate law claims) and a federal forum provision (on federal securities law claims). See *supra* note 1 for more details.

⁵ See Holger Spamann, *Indirect Investor Protection: The Investment Ecosystem and Its Legal Underpinnings*, *forthcoming* in *Journal of Legal Analysis* (2022) (stating that the absence of secondary market trading and inability to take short positions (by more informed traders) can likely lead to less informative prices in primary markets). Furthermore, there is empirical evidence that suggests that the secondary market for the IPO stock also tends to be different from the secondary market for others. See Jay Ritter and Ivo Welch, *A Review of IPO Activity, Pricing, and Allocations*, 57 *Journal of Finance* 1795, at 1817—1822 (2002) (documenting how IPO shares under-perform compared to a market index over a three year period). But see Amy Edwards and Kathleen Hanley, *Short Selling in Initial Public Offerings* 98 *Journal of Financial Economics* 21 (2010) (documenting how short selling occurs on the offer day in 99.5% of the IPOs).

⁶ Moonchul Kim and Jay Ritter, *Valuing IPOs*, 53 *Journal of Financial Economics* 409 (1999), for instance, shows that various accounting metrics, such as price-earnings ratios, market-to-book ratios, and price-to-sales multiples of firms that are making initial public offerings have only modest predictive ability on valuation. Jay Ritter and Ivo Welch (2002) argues that the asymmetric information may not be the "primary" driver of many IPO phenomena, but suggests that the agency conflict explanation (which presumably relies on some informational issues between issuers and underwriters) can play an important role. See also Jay Ritter, *Equilibrium in the Initial Public Offerings Market*, 3 *Annual Review of Financial Economics* 347 (2011) (arguing that factors, such as underwriters' desire to excessively underprice the IPOs, lack of competition among underwriters, and the issuers' lack of focus on maximizing the proceeds, can better explain IPO underpricing than asymmetric information factors). See also Patrick Corrigan, *Footloose with Green Shoes? Can Underwriters Profit from IPO Underpricing?* 38 *Yale Journal on Regulation* 908 (2021) (showing how underwriters can profit from using "green shoe" options possibly at the expense of the issuers).

will correctly value the offered governance package.⁷ There also is empirical evidence that shows a relatively wide adoption of certain governance features, such as anti-takeover provisions (including the staggered board), at IPOs even when such features may be (or even likely to be) suboptimal for the adopting firms (e.g., particularly those in the industry with a relatively high takeover possibility).⁸

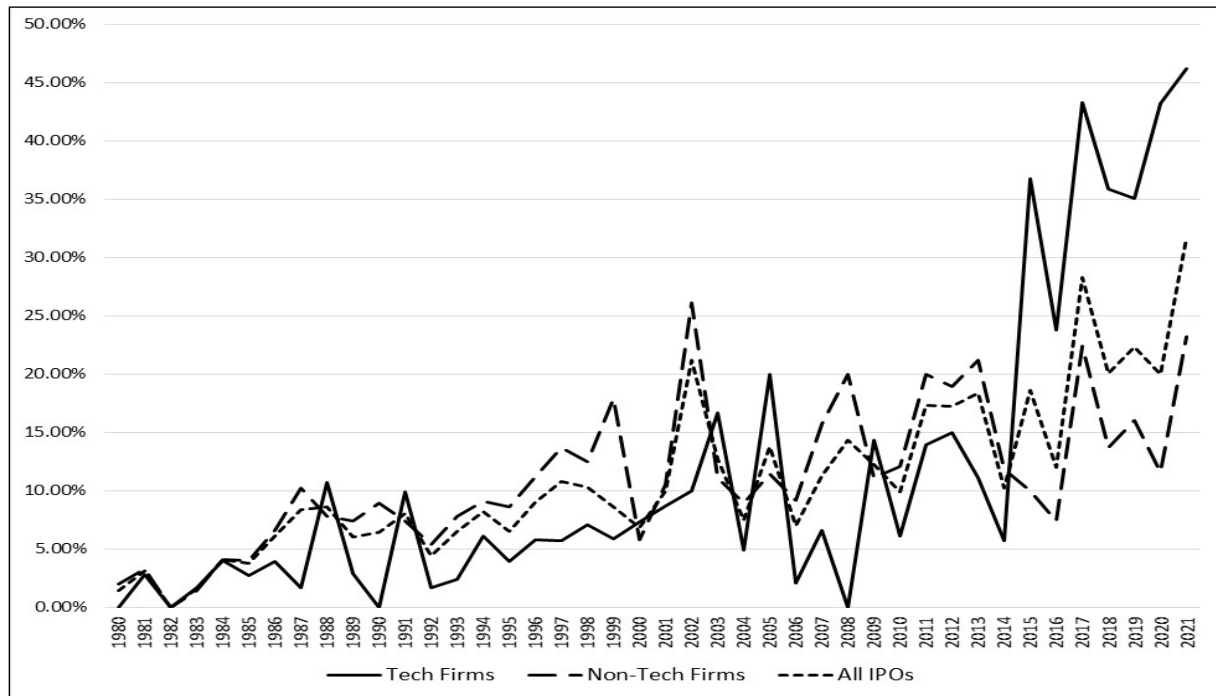


Figure 1: Fraction of Dual-Class IPOs⁹

While the debate remains unresolved, the recent surge of dual class stock initial public offerings and the proposal to allow companies to adopt mandatory arbitration provisions for federal securities class actions¹⁰ have brought the issue back to the front. The arguments over dual class stock have been particularly heated.¹¹ Opponents of dual class stock have argued that a dual class

⁷ See generally Ritter and Welch (2002) (discussing various structural attributes of the initial public offering market and also documenting both short-term over-performance and long-term under-performance of IPO stock). See also Michelle Lowry, Micah Officer, and William Schwert, *The Variability of IPO Initial Returns*, 65 *Journal of Finance* 425 (2010) (demonstrating a large amount of pricing volatility in IPO shares).

⁸ See Part I, *infra*, for a more detailed discussion of the literature.

⁹ The data comes from Ritter's website: <https://site.warrington.ufl.edu/ritter/ipo-data/>.

¹⁰ See Scott and Silverman (2013). See Aggarwal, Choi, and Eldar (2020) for a discussion of the debate over mandatory arbitration provision. A mandatory (individual) arbitration or other forum provisions, *per se*, do not directly implicate the governance issue but they can do so indirectly. Proponents of mandatory arbitration clause argue that the provision will allow more speedy resolution and recovery for the shareholders and prevent vexatious and frivolous lawsuits from being filed. Opponents, on the other hand, have argued that this will prevent shareholders from bringing even meritorious claims (or even altogether deny their right to bring suit) and worsen the agency problem between the managers and the shareholders. See, e.g., Grundfest (2019-2020) (arguing that claims based on 1933 Securities Act largely stem from directors' and executives' breach of fiduciary duty to their prospective shareholders).

¹¹ See Lucian Bebchuk and Kobi Kastiel, *The Untenable Case for Perpetual Dual-Class Stock*, 103 *Virginia Law Review* 585 (2017) (advocating for sunset provisions on dual class structure). But see Jill Fisch and Steven Davidoff Solomon, *The Problem of Sunsets*, 99 *Boston University Law Review* 1057 (2019) (arguing that a fixed sunset

structure, by making outside investors' voting rights irrelevant (sometimes through no-vote stock), epitomizes suboptimal governance structure, especially when such structure does not have a pre-determined termination date ("perpetual dual class stock").¹² The Council of Institutional Investors (CII),¹³ for instance, has requested the New York Stock Exchange and NASDAQ—two largest stock exchanges—to impose a mandatory sunset provision on firms that go public using dual class stock¹⁴ and has also asked entities that manage popular stock indices, such as S&P 500 and Russell 2000, to exclude certain no vote stock and dual class stock without a sunset provision from the indices.¹⁵ Proponents, on the other hand, have argued that dual class structure can actually enhance firm value by either allowing the founders to pursue their "idiosyncratic vision,"¹⁶ to stay "innovative,"¹⁷ or to facilitate founder-controller's long-term commitment.¹⁸

What is also interesting about companies going public with a dual class structure is that, despite the concerns and criticism,¹⁹ the structure has been gaining popularity among IPO firms and that there seems to be a substantial amount of variation among firms over the degree of separation between control and cash flow rights. In 2021, for instance, among all the firms going public, about 31.7% of the firms had a dual-class structure and the fraction of "tech" firm IPOs with a dual class is even higher at 46.2% (Figure 1).²⁰ Also, while most firms allow public (outside) shareholders to have at least some voting power (e.g., one vote per share), others, such as Snap and Alphabet (through its issuance of Class C non-voting stock), have taken that away altogether.²¹

provision for dual class stock may create moral hazard problem, for instance, by incentivizing the founder to maximize their economic position while they have control). See also Jennifer Arlen and Eric Talley, *Unregulable Defenses and the Perils of Shareholder Choice*, 152 *University of Pennsylvania Law Review* 577 (2003) (arguing that giving shareholders choice over (hostile) tender offers can lead the managers to engage in other value-reducing, defensive behavior that can ultimately undermine shareholders' rights).

¹² See Bebhuk and Kastiel (2017).

¹³ The Council of Institutional Shareholders, founded in 1985, is a non-profit association that represent many of the largest pension funds (such as corporate and labor union pension funds), foundations, and endowments in the US. The combined assets under the management is about \$4 trillion. See <https://www.cii.org/about>.

¹⁴ The Council of Institutional Investors' Letter to NASDAQ and NYSE on October 24, 2018. See also Bebhuk and Kastiel (2017) at 597—599, and David Berger, *Why Dual Class Stock? A Response to CII's Petition to NASDAQ for Mandatory Sunset Provisions* (2019) (arguing that firms with dual class stock structure out-perform those without for more than seven years).

¹⁵ The Council of Institutional Investors' Letter to MSCI Index Committee on May 9, 2018.

¹⁶ See Zohar Goshen and Assaf Hamdani, *Corporate Control and Idiosyncratic Vision*, 125 *Yale Law Journal* 560 (2016) (arguing that allowing the founder to retain control, with dual class stock structure, for instance, can allow the founder to implement her "idiosyncratic vision" that is not appreciated by the market).

¹⁷ See Berger at 4 (2019) (arguing that the firms with dual class stock are often the most innovative companies and due to the concentration of stock ownership among a small number of institutional shareholders, dual class allows the innovative founders to retain the decision making power and keep it away from the dominant institutional shareholders).

¹⁸ See Albert H. Choi, *Concentrated Ownership and Long-Term Shareholder Value*, 8 *Harvard Business Law Review* 52 (2018) (demonstrating how moderate amounts of private benefits of control can incentivize the controller to care for the long-term value of the company).

¹⁹ In Daines and Klausner (2001) sample, only 6.4% of the IPO companies had a dual class stock structure. See also Choi (2018) (how Google overcame investors' resistance against dual class stock) and Fisch and Davidoff Solomon (2019) (describing the SEC's attempt to ban dual class structures).

²⁰ The data comes from Ritter's website: <https://site.warrington.ufl.edu/ritter/ipo-data/>.

²¹ See also Dhruv Aggarwal, Ofer Eldar, Yael Hochberg, and Lubomir Litov, *The Rise of Dual-Class IPOs*, 144 *Journal of Financial Economics* 122 (2022) (empirically documenting the variance of dual class structures among IPO firms and also showing how founder-controller's bargaining power affects the "wedge" between voting and economic rights). At least with rational agents, one party's superior bargaining power shouldn't matter much in affecting

Various antitakeover provisions also seem to have gotten more popular among IPO firms. For instance, according to one study, about 90% of a sample IPO firms (that did not have a controlling shareholder) adopted a staggered board in 2020.²² Even if we were to assume that the IPO market is functioning relatively well, the fact that there is a variance among firms over adoption of dual class stock and various anti-takeover provisions seems to suggest that perhaps the optimal governance arrangement will vary with the company.²³ In addition, with respect to dual class stock, unlike other governance provisions (such as whether shareholders can call a special meeting or can act through written consent),²⁴ the dual class structure seems to be quite salient from the investors' perspective. The investors, particularly the institutional investors (as evidenced by the CII's proposal), seem to care a lot (or at least a lot more than they did) about the dual class structure.²⁵ The evidence suggests that not only are the firms making a more deliberate choice over certain governance structures, but the investors also seem to care about them much more.

This paper attempts to examine this issue of initial public offering and firm governance arrangements. With the help of game-theory, the paper foremost argues that even if the initial public offering market rationally values the stock and each firm's governance arrangements, when different firms have different optimal governance structures and the outside investors do not know the types of firms that they face,²⁶ it becomes likely that the governance package offered by the firms (or at least a subset of them) will be suboptimal. The analysis reveals that the traditional theory that the firms will adopt the optimal governance arrangement at the time if the IPO relies on at least one of two assumptions: (1) one type of governance structure (e.g., one-share-one-vote arrangement) is optimal across the board; or (2) outside investors know which governance arrangement is optimal for which firm and they can accurately price the stock. When either or

“qualitative” features of the firm, such as its governance arrangements. The evidence that a founder's superior bargaining leverage affects the wedge suggests that the bargaining between the controller and the investors (the market) isn't being conducted under homogeneous informational environment. See Albert H. Choi and George Triantis, *The Effect of Bargaining Power on Contract Design*, 98 *Virginia Law Review* 1665 (2012) (showing how lack of symmetric information can affect non-price terms in contracts when one party has superior bargaining power).
²² See Davis Polk, *IPO Governance Survey (2020)* (showing that, among 50 non-controlled company IPOs, about 88% of them effectively prohibited shareholder action by written consent, 88% required a supermajority shareholder vote to amend bylaws, and 90% with a staggered board).

²³ *Id.* See also Aggarwal, Choi, and Eldar (2020) for variation among firms that adopt an exclusive forum provisions for 1933 Securities Act claims (“federal forum provisions”) (showing how IPO firms that are backed by venture capital firms or face a larger litigation risk are more likely to adopt a federal forum provision).

²⁴ One exception to this may be a mandatory individual arbitration provision, as demonstrated by the Carlyle IPO example. See *supra* note 3.

²⁵ If a certain governance feature is much more salient from the perspective of the prospective investors, presumably its adoption presumably depends less on the type of law firm or an investment bank hired for an initial public offering. See John Coates, *Explaining Variation in Takeover Defenses: Blame the Lawyers*, 89 *California Law Review* 1301, 1381-82 (2001) (reporting that “a lack of pricing penalty [on antitakeover provisions at IPOs] is also consistent with anecdotal reports from IPO participants, including investment bankers, venture capitalists, and lawyers from Wilson Sonsini (among other lawyers), who all uniformly report in conversations that conventional defenses do not affect IPO pricing).

²⁶ Even if a majority of the IPO investors are sophisticated institutional (and not retail) investors, when they lack the necessary information, this suboptimal equilibrium is possible. Although the founders and other pre-IPO investors sell only a fraction of the firm to the public in the IPO, to the extent that receiving a larger proceed from the offering is more beneficial, the incentive to take advantage of the informational advantage will be present. See Spamann (2022) (noting that the absence of speculators betting against the stock price in the primary market can lead to less informative prices at IPOs). But see Edwards and Hanley (2010) (documenting short selling at IPOs).

both of these assumptions break down, it becomes likely that the governance package chosen by an IPO firm would be suboptimal.

After presenting the basic thesis, the paper also examines various mechanisms through which the firms can be induced to adopt the optimal governance mechanism at its IPO. These mechanisms are divided into two categories. On the one hand, the firms themselves may be able to “signal” to the market about their true valuation. On the other, to the extent that their IPO prices are over-valued (due, for instance, to an inefficient governance structure), the investors may bring a claim against the firm after its IPO, and the firm may be found liable (for material misrepresentation or omission). With respect to the first, private ordering mechanisms, the paper examines how a firm can credibly signal to the market, for instance, by employing a set of reputable agents to conduct the IPO (i.e., relying on a gatekeeper), by relying more on internal capital markets (and less on external financing), and by deliberating underpricing its IPO. The paper analyzes the potential cost associated with each mechanism. One important theme that arises in these mechanisms is that whether they can enhance the efficiency of the IPO market depends a lot on how much “skin in the game” is being retained by the founder-controller (with other pre-IPO shareholders) and the fraction of the firm’s equity being sold to the market.

The findings lead to various positive and normative implications. On the positive side, the paper shows why it may be possible to observe IPO firms adopting relatively homogeneous governance features even if they may not be optimal for all firms and also shows under what circumstances we may be more confident that the firm’s choice would be optimal. On the normative side, the paper examines various policy proposals. In particular, the paper examines the (mandatory or optional) sunset proposal,²⁷ which would allow (or even require) outside investors to revisit a firm’s initially chosen governance structure after the firm’s IPO, and analyzes conditions under which allowing the outside investors to revisit the initial governance feature may be optimal. Although a full discussion is reserved for later, a few points may be worth a brief mention. The first is that a sunset provision can create a tradeoff between ex ante and ex post efficiency: while it may allow the investors to eliminate or mitigate inefficient governance regime post-IPO (ex post efficiency), it may lessen the firm’s incentive to adopt the optimal governance structure at its IPO (ex ante efficiency). The second issue is that, when firms have a choice to adopt a sunset provision, the firm may be quite hesitant to adopt a provision at its IPO due to fear of sending an adverse signal to the market. The third point is that the initial governance choice at IPO can create a “lock-in” effect, thereby making it difficult (if not impossible) to incentivize the parties to revisit the structure post IPO by utilizing an optional sunset provision.

The paper is organized as follows. In Part I, the paper presents a brief overview of the existing literature on governance arrangements adopted by firms at initial public offerings. The review starts with the debate the scholars and practitioners had with respect to anti-takeover measures about 20 years ago and features the more recent debate over dual class stock. Part II presents a numerical example that shows how the presence of heterogeneity and information imperfection can lead to adoption of suboptimal governance arrangement at IPOs. In Part III, the paper discusses two forces that could mitigate the suboptimal equilibrium: potential costly signaling by IPO firms and ex post liability. With respect to the former, the paper examines

²⁷ See generally Bebchuk and Kastiel (2017) and Fisch and Davidoff Solomon (2019) for debate over mandatory and optional sunset provisions on dual-class stock.

reliance on reputable agents as a screen, reliance on internal capital markets, and deliberate underpricing of the IPO. In Part IV, the paper discusses implications, both positive and normative, of the findings. The last Part concludes with some thoughts for future research.

I. A Review of Existing Scholarship

The debates over whether firms going through an initial public offering have the requisite incentive to adopt the optimal governance features and, more generally, over how much “contractual” freedom the firms should be able to exercise have been around for quite some time.²⁸ A few important articles in early 2000s have presented surprising findings that, despite the conventional understanding that anti-takeover mechanisms are suboptimal, many firms going public had various anti-takeover provisions. Daines and Klausner, for instance, looked at 310 firms that went public between January of 1994 and July of 1997 and found that about two-thirds of the sample firms had anti-takeover provisions.²⁹ Similarly, Field and Karpoff examined 1,019 industrial firms that went public between 1988 and 1992 and showed that about 53% of the firms had at least one takeover defense provision.³⁰ In examining what might have influenced the IPO firms to adopt (what they perceived to be inefficient) anti-takeover provisions, Coates documented that, among the 195 sample firms that went public in 1988 and 1999, there was a strong correlation between an IPO firm’s adoption and various law firm characteristics, such as its takeover experience, size, and location.³¹ The paper also found that there seems to be no correlation between the presence of an antitakeover provision and the IPO pricing, suggesting that the firms with (possibly) inefficient provisions are not being “penalized” by the IPO market.³² These studies collectively suggest that there is a substantial doubt as to whether the IPO market is pricing various governance features correctly, especially if we believe that the anti-takeover provisions are bad for the shareholders, and whether adoption of certain governance features are driven more (or even primarily) by non-valuation factors (such as the type of law firm used in the IPO process).

²⁸ See Easterbrook and Fischel (1989 and 1991) and Bebchuk (1989).

²⁹ See Daines and Klausner (2001). The provisions they examined include: dual-class stock, staggered board, shareholders’ right to act through written consent or to call a special meeting, blank check preferred stock provision, and opting out of Delaware’s section 203 business combination statute. *Id.* at 96. They also show that the presence of antitakeover provisions is positively correlated with a measure of takeover activity in the industry and is negatively correlated with a firm’s R&D activity. *Id.* at 100-103. In a more recent paper, Klausner looked at other governance features, such as the presence of an independent compensation, nominating, or governance committees, separation of CEO and board chair, and the majority rule on director elections, among 373 firms, and found that very few deviated from the standard, default provisions. See Klausner (2013).

³⁰ See Field and Karpoff (2002). In a more recent study, there seems some evidence that firms that have valuable long-term business relationships (with suppliers, for instance) are more likely to have anti-takeover provisions. See Johnson, Karpoff, and Yi (2015). But see Lucian Bebchuk, *Why Do Firms Adopt Antitakeover Arrangements*, 152 *University of Pennsylvania Law Review* 713, 728 (2003) (arguing that if the protection of such firm-specific investments are important, shareholders should be much more willing to adopt antitakeover provisions after the IPO rather than resisting them as empirically observed).

³¹ See Coates (2001) at 1831 (stating that “a lack of pricing penalty [on antitakeover provisions at IPOs] is also consistent with anecdotal reports from IPO participants, including investment bankers, venture capitalists, and lawyers from Wilson Sonsini (among other lawyers), who all uniformly report in conversations that conventional defenses do not affect IPO pricing). The paper also shows that the incidence of staggered board, an important anti-takeover mechanism, compared to the earlier studies, is even higher at 82%. *Id.* at 1377.

³² *Id.* at 1381-82.

Motivated by the puzzle over why many firms adopt anti-takeover provisions at IPO, some scholars have taken a more theoretical approach. Bebchuk, for instance, presents an analytical model that examines whether a firm (either at IPO or post-IPO) would allow its board to have a veto power over future takeover bids, essentially, an anti-takeover arrangement.³³ The analysis shows that granting the board with veto power enables the founder-controller to extract more private benefits of control but can also reduce the founder-controller's resistance from raising more equity capital and further diluting her ownership fraction in the future.³⁴ Giving the board a veto power can be beneficial particularly when future equity financing can enhance the value of the firm. In Bebchuk's analysis, the firm is making a tradeoff: the benefits of being able to take advantage of future equity financing and the costs of private benefits of control that the founder-controller extracts from the firm.³⁵ Barzuza similarly focuses on the tradeoff between private benefits of control and firm value, and shows how firms might adopt inefficient governance arrangement mid-stream (or even at their IPOs) when outside investors do not have adequate information.³⁶ This paper builds on these earlier analyses but focuses more on how other factors, such as potential mispricing of the IPO shares, volatility of IPO prices, and the fraction of ownership sold at IPO, can affect the incentive to adopt optimal governance arrangement. The paper also examines possible mechanisms (both private ordering and post-IPO liability) that could mitigate the misaligned incentive problem.³⁷ In the process, the paper focuses less on private benefits of control and more on governance and pricing mismatch among firms.³⁸

While the issues over antitakeover provisions adopted by IPO firms have remained unsettled, recent discussion over dual class stock (and over mandatory individual arbitration provision) seems to have reignited the debate. Since Google's IPO in 2004, the number of (especially "technology") firms that have adopted a dual class structure has substantially increased

³³ See Bebchuk (2003).

³⁴ *Id.* at 730—33. The paper also presents a brief discussion of the problem that investors' incomplete information can have in inducing the firms to adopt the optimal governance arrangement at their IPOs.

³⁵ By contrast, Kahan and Rock take an approach, under which, by adopting an antitakeover device, a firm can endow its managers with a strong bargaining power against a future, yet-unknown buyer and thereby increase the return for the shareholders. See Marcel Kahan and Edward Rock, *Precommitment and Managerial Incentives*, 152 *University of Pennsylvania Law Review* 473 (2003). See also Lynn Stout, *The Shareholder as Ulysses: Some Empirical Evidence on Why Investors in Public Companies Tolerate Board Governance*, 152 *University of Pennsylvania Law Review* 667, 702 (2003) (arguing that public company shareholders are willing to tolerate anti-takeover arrangements so as to encourage managers to make more firm-specific human capital investment).

³⁶ See Barzuza *Inefficient Tailoring: The Private Ordering Paradox in Corporate Law*, 8 *Harvard Business Law Review* 131 (2018) at 146—151. See also Kobi Kastiel and Yaron Nili, *The Corporate Governance Gap*, 131 *Yale Law Journal* 782 (2022) (showing how the governance structures of smaller market cap companies can depart significantly from larger companies).

³⁷ In Bebchuk's analysis, the founder sells a fraction of its equity to raise financing but the primary motivation over whether to allow the board to have the veto power over takeover bids is concern over whether the founder will have an incentive not to engage in additional financing post IPO so as to protect his private benefits of control. See also Ivo Welch, *Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings*, 44 *Journal of Finance* 421 (1989) for an analysis that examines how the desire to engage in secondary equity issuance can lead to underpricing at the IPO. Also, in Barzuza's analysis, the firm is trying to maximize its valuation minus the value of private benefits. See Barzuza (2018) at 146—151.

³⁸ Less emphasis on private benefits of control is in contrast with Bebchuk (2003) and Barzuza (2018). An interesting question that needs further examination is how founder-controller's private benefits of control interacts with a firm's governance choice. See the discussion in *Concluding Remarks*. See also Choi (2018) (how private benefits of control can create a lock-in effect on the controller and induce the controller to care for the long-term).

over time.³⁹ The opinion seems to be sharply divided among investors and practitioners over whether this is a good trend. On the one side, the Council of Institutional Investors have taken a position against dual class structure, advocating for a mandatory sunset provision (of 7 years or less after the IPO) or exclusion from some of the major indices for certain no vote or dual class stock.⁴⁰ Some practitioners have argued, on the other hand, that dual class stock structure is necessary and beneficial for particularly innovative companies and the structure also allows the founders to engage more broadly in stakeholder governance.⁴¹ There is a sharp disagreement among academics as well. Bebchuk and Kastiel have argued that the potential benefits of having a dual class structure tends to recede over time while the cost of allowing a company to perpetually maintain such a structure is large, and have advocated for a sunset provision.⁴² Goshen and Hamdani, on the other hand, have argued that concentrated ownership, possibly with dual class stock, can allow the founder to realize her “idiosyncratic” vision that is not appreciated by the capital market and can benefit all the shareholders in the long run.⁴³ With respect to the sunset provisions, Fisch and Davidoff Solomon have taken a position against time-based sunset provisions, arguing that the provision can lead to other moral hazard problems, including the founder-controller economically entrenching herself before the sunset kicks in.⁴⁴

On the empirical side, Masulis, Wang, and Xie examined whether the agency problems are more serious at dual-class companies and show that as the “wedge” between the cash flow and control rights get larger, company CEOs receive higher compensation and capital expenditures contribute less to shareholder value.⁴⁵ Similarly, Gompers, Ishii, and Metrick have examined the impact of having a wedge on firm valuation and performance (post IPO), and showed that as the

³⁹ See Choi (2018) (showing that in response to IPO investors push-back against using dual class stock, the company’s founders circulated a letter to the investors touting the virtues of having a dual class stock, such as being able to focus on the long-term objectives of the company and not being subjected to short-term fluctuations in earnings and stock prices). See Figure 1 *supra*.

⁴⁰ See the discussion in the Introduction *supra*.

⁴¹ See Berger (2019) at 8 (discussing how founders seek to elect directors who are “focused on the interests of various stakeholders and broader issues such as corporate purpose”).

⁴² See Bebchuk and Kastiel (2017) at 613–617 (analytically showing founder’s structural incentive to resist conversion to single-class structure when the founder enjoys significant private benefits of control).

⁴³ See Goshen and Hamdani (2016) at 566 (arguing that allowing the entrepreneur to retain control over time enables the entrepreneur to “pursue her idiosyncratic vision for producing above-market returns”).

⁴⁴ See Fisch and Davidoff Solomon (2019). The article also argues that we should encourage more private ordering solutions regarding sunsets, including “event-based sunsets,” that rely on “objective events that are more likely to result in the founder losing track of his or her mission or being overly incentivized to favor his or her own interests.” *Id.* at 1086. More broadly about private ordering solutions, the article states that “there is particular value to market participants working to develop norms and standards around the types of sunsets that the market should demand of dual class issuers.” *Id.* at 1092.

⁴⁵ See Ronald Masulis, Cong Wang, and Fei Xie, Agency Problems at Dual-Class Companies, 64 *Journal of Finance* 1697 (2009) (finding that as the wedge increases, corporate cash holdings become worth less to outside shareholders, CEOs receive higher compensation, managers make shareholder value-destroying acquisitions more often, and capital expenditures contribute less to shareholder value). To the extent that the empirical studies are showing that dual-class firms perform “worse” than single-class firms, the studies are focusing on the return for the public (outside) shareholders. The studies do not attempt to measure the amount of private benefits of control that the controller captures. One can argue that the total welfare should take into account both the public value of the firm and the private benefits of control. Some studies have tried to measure the private benefits of control more indirectly by estimating the control premium when control block is being sold. See Choi (2018) at 64–65 (discussing earlier empirical studies on measuring control premiums).

wedge gets larger, firm's performance, as measured by Tobin's Q, decreases.⁴⁶ Some scholars have examined dual-class company IPOs more directly and, here, the evidence seems to be more mixed. Smart and Zutter have found that dual-class IPOs are less likely to be underpriced compared to single-class firms.⁴⁷ Cremers, Lauterbach, and Pajuste and Kim and Michaely show that dual-class companies exhibit higher valuations (in terms of Tobin's Q) compared to comparable single-class firms around the time of the IPO.⁴⁸ At the same time, both papers show that as dual-class firms age, their valuations and stock premiums tend to decline. Looking more closely at characteristics of dual-class firms at IPOs, Aggarwal, Eldar, Hochberg, and Litov show how there is much variance among dual class structures and also that the size of the wedge tends to depend a lot on the founder's bargaining power, measured, for instance, by the ease of access to private financial markets.⁴⁹ Overall, the empirical studies on dual-class IPOs suggest that not only are there great variance among dual-class firms but also that some dual-class firms actually perform well (either in terms of valuation or stock returns) around the time of their IPOs.⁵⁰

II. A Numerical Example of IPO Pricing of Governance Structure

In this Part, we present a numerical example, based on game theory, that shows how IPO process can value different governance structures. The example assumes that all the participants in the market are "rational," in the sense that they price the offered stock in the best way possible with all available information. The numerical examples do not rely on any "behavioral" or

⁴⁶ See Paul Gompers, Joy Ishii, and Andrew Metrick, *Extreme Governance: An Analysis of Dual-Class Firms in the United States*, 23 *Review of Financial Studies* 1051 (2010) (finding that the dual-class firm value increases as the insiders' cash-flow rights increase but decreases as the insiders' voting rights increase).

⁴⁷ Scott Smart and Chad Zutter, *Control as a Motivation for Underpricing: A Comparison of Dual and Single-Class IPOs*, 69 *Journal of Financial Economics* 85 (2003).

⁴⁸ Martijn Cremers, Beni Lauterbach, and Anete Pajuste, *The Life-Cycle of Dual Class Firm Valuation*, working paper (2020) (empirically demonstrating that the dual class firms have higher valuations at the IPO and as the firms age the valuation premium dissipates) and Hyunseob Kim and Roni Michaely, *Sticking around too Long? Dynamics of the Benefits of Dual-Class Voting*, working paper (2019) (showing that young dual-class firms trade at a premium and operate at least as efficiently as young single-class firms but as dual-class firms' valuations decline as they mature). In the study by Cremers, Lauterbach, and Pajuste, at around the IPO, dual-class firms have an average Tobin's Q that is 0.36 higher than comparable single-class firms but the difference disappears by about 4 years after the IPO. See Cremers, Lauterbach, and Pajuste (2020) at 56 (Table 4). The study also shows that there is a large variation in the valuations among dual and single class firms at both the IPO and in subsequent years. *Id.* at 59 (Table 5). The study by Kim and Michaely also looks at other factors such as the voting premium (of high-vote stock) and the amount of cash dividends paid by dual versus single class firms and show that as the dual-class firms age, the voting premium decreases and that dividends are perceived to be more valuable. Kim and Michaely (2019) at 11—14.

⁴⁹ See Aggarwal, Eldar, Hochberg, and Litov (2022).

⁵⁰ To the extent that the market has a sufficient foresight, these findings support the thesis that the companies are not being "punished" for adopting a dual-class structure or perhaps even that the IPO market perceives them rather favorably. The issues of how dual-class companies perform in the long-run and how post-IPO, "mid-stream" governance changes can be implemented is an important issue but is not the focus of this paper. Post-IPO governance changes raise their own challenges. One the one hand, given that the firm's stock has been subject to various disclosures and secondary market trading for some time, one could assume that the informational issues, compared to the IPO market, may be less and the outside investors are better aware of which governance feature would be optimal for which firm. On the other hand, there also is a possibility that the firm is "locked into" the existing governance structure due to various factors, such as founder-controller's private benefits of control, firm-specific investment, etc.

“psychological” imperfections of the participants.⁵¹ Especially with respect to the outside investors, we assume that they can accurately estimate the impact that a certain governance structure has on the firm’s (long-term) value. At the same time, two important variations we examine in more detail are: (1) heterogeneity in optimal governance structures (no single governance structure is optimal for all firms), and (2) whether investors have all the relevant information about which governance feature is optimal for which firm (problem of incomplete or asymmetric information).

A. The Example Setup

Our numerical example has two players: the firm that sells its stock to the outside investors (or simply “investors”),⁵² and the outside investors who purchase the stock.⁵³ The firm (along with the pre-IPO shareholders, including the founders) is going through an initial public offering to raise capital with a governance structure, and outside investors decide on how much they are willing to pay for the firm’s offered stock with the offered governance structure. Initially, we assume that there are two types of firm: the firm can be either “high” or “low” type with equal probabilities.⁵⁴ We will be more precise about this firm type shortly. We assume throughout the analysis that all players (the firm and the investors) know the probabilities. We assume that while the firm knows its type, this information may or may not be known by the investors.⁵⁵ The firm chooses its governance structure and offers the stock to the outside investors. The financing need for the firm is \$50 and the firm is offering a fraction of the firm’s stock to meet its financing need. Depending on what the outside investors believe about the firm’s future prospects (which, in turn, depends on the firm type and its governance structure), the firm may need to offer a larger or a smaller fraction of its equity ownership to the investors. We will see shortly that this also translates to the IPO price.

⁵¹ See, e.g., Patrick Corrigan, *The Seller’s Curse and the Underwriter’s Pricing Pivot: A Behavioral Theory of IPO Pricing*, 13 *Virginia Law and Business Review* 335 (2019) for a behavioral imperfections based theory of IPO underpricing.

⁵² By “outside investors,” we mean to include both institutional and retail investors. It usually is the case that the bulk of the IPO shares are bought by institutional (and other high net worth retail) investors but so long as the firm is better informed than the outside investors, the analysis will carry through. See Ritter (2011).

⁵³ The description of the game periods, respective player’s strategies, information sets, and the payoffs are embedded in the description. With respect to the stages, we assume that there are four period ($t \in \{0,1,2,3\}$) with no time discount. At $t = 0$, the nature chooses the firm type; at $t = 1$, the firm offers to sell its stock with certain governance features; at $t = 2$, the investors decide whether to accept the offer; and at $t = 3$, the payoffs are “realized.”

⁵⁴ We are assuming equal probabilities for analytic simplicity. We can allow the probabilities to be uneven but the basic thesis will remain unchanged.

⁵⁵ The assumption that the firm knows its type (along with the optimal governance structure) while the outside investors do not is made for expositional ease but can be strong. Two points are worth mentioning. First, what is important is not that the firm knows, for certain, its “true” type but rather than the firm knows more about the type than the outside investors. That is, the firm is better aware of what its optimal governance structure would be (along with the valuation) than the outside investors. Second, the analysis can easily incorporate a third type of firms, those who do not know what the optimal governance structure for them is. It is fairly straightforward to show that the uninformed firms will be concerned of sending an adverse signal to the market (and being punished on valuation). In a pooling equilibrium, for instance, the uninformed firms will choose the governance structure that the informed firms choose. In a separating equilibrium (under which the informed firms separate on governance structures), the uninformed firms will choose a governance structure that gives them, on average, a larger valuation. The outside investors, in response, will make an adjustment in accordance, in terms of how much they would be willing to pay.

After observing the firm's offer, relying on the outside investors' belief (or knowledge) about the firm type, the investors decide whether to buy the offered stock and for how much. We assume that while the firm's type may not be known, the firm's choice over governance structure is observed by the investors. Based on the observed governance structure and the offered price, the investors make their purchase decision. To keep things simple, we assume that the investors must break even: how much they are willing to pay should be equal, in expectation, to the value of the ownership fraction offered by the firm. For instance, if the firm is offering to sell 50% of its equity (in terms of cash flow, such as dividends and other in-kind distributions) to the investors to raise \$50, the investors must believe that the firm is worth, in expectation, at least \$100. When the investors purchase the stock, the firm spends the proceeds (\$50) on its proposed investment project and the future cash flows get realized.

In terms of the firm's choice, the firm decides whether to adopt a certain corporate governance structure before it offers to sell its stock to the outside investors. Though the governance arrangements can include numerous different dimensions, such as dual class stock, staggered board, mandatory arbitration provision, percentage of independent directors, restricted shareholders' right to call shareholders' meeting or nominate directors, and so on, for the sake of simplicity, we use the choice over single versus dual class stock as our working example. By dual class stock, we mean having a multiple classes of stock, where all classes have the same cash flow rights, but a certain class has a superior voting right. We also assume that the high vote shares are retained by the founder-controller (and possibly other pre-IPO shareholders) so as to give the founder-controller (de facto) control power over the firm.⁵⁶

For instance, suppose the firm needs to sell 70% (in terms of cash flow) of its equity to the outside investors. If the firm is capitalized with one class of stock (each share with one vote) and if there are 1000 shares outstanding, 700 shares will be owned by the outside investors, giving them 70% of the total voting power and cash flow rights, with the founder-controller retaining 30% both in terms of cash flow and voting rights. By comparison, suppose the firm is capitalized with two classes of stock: 700 shares of Class A with each share having one vote per share; and 300 shares of Class B with each share having ten votes per share. Suppose also that both classes have the same cash flow right, Class A shares are sold to the outside investors, and Class B shares are retained by the founder-controller (and other pre-IPO shareholders). With this dual class structure, while the public investors will be entitled to 70% of the firm's cash flows, their voting control will only be about 19% ($\approx 700/3700$). In the former case with a single class structure, the founder-controller, with 30% voting power, may not have (de jure) control over the firm, but in the latter case, the founder-controller, with about 81% voting power, is certain to retain her control.

Turning to the firm types and valuations, for the "high-type" firm, having a dual class stock structure is beneficial and increases its total firm value. This may be because the structure allows the founder-controller to focus on the long-term and not worry about the short-term fluctuations of the stock price or earnings or not face any potential threat from short-term investors (including,

⁵⁶ There certainly are many different types of "dual-class" structure and many different ways to create a "wedge" between cash-flow rights and voting/control rights. But, we are abstracting away from the variance to make the analysis simple. See Aggarwal, Eldar, Hochberg, and Litov (2022) (empirically documenting and examining different types of dual-class firms at their IPOs).

possibly short-term activist investors).⁵⁷ The dual class structure can also allow the founder-controller to implement her long-term, idiosyncratic vision⁵⁸ and not have to worry about being subject to a hostile takeover. To be more concrete, suppose that if the high-type firm were to have a dual class stock structure, its (fundamental) total market valuation (in expectation) is \$100, whereas without a dual class stock structure, the total market valuation drops to \$60.⁵⁹ These valuation numbers represent the present discounted value of future cash flows that result from implementing the firm's investment.⁶⁰

	High Type	Low Type
Dual Class Stock	\$100	\$60
Single Class Stock	\$60	\$70

Table 1: Firm Valuations under Heterogeneity

For the “low-type” firm, on the other hand, the optimal governance arrangement is to have a one-share-one-vote, single-class structure. If the low-type firm were to have a dual class stock structure that gives disproportionate voting power to the founder-controller, for instance, the capital structure will entrench the founder-controller and allow her to extract more private benefits of control at the expense of the outside shareholders.⁶¹ By having a single class of stock structure, the low-type firm reduces the incentive for the founder to extract private benefits of control (since, in part, the founder is retaining more of the future cash-flows) and also opens up the possibility of being subject to a value-increasing takeover or shareholder activism in case the firm performs poorly. Suppose, for the low-type firm, with a dual class stock structure, its (fundamental) market valuation (in terms of present value of future cash flows) is \$60 and with the single class stock structure, its market valuation increases to \$70.

⁵⁷ This was the primary argument made by Google when it went public using dual class stock structure. See Choi (2018) (arguing that while separation of cash flow right from control right can enable the controller to extract more private benefits of control after the firm goes public, such non-transferrable private benefits of control can also create a lock-in effect to induce the controller to care for the long-term value of company). See also David Berger, *Why Dual Class Stock? A Response to CII's Petition to NASDAQ for Mandatory Sunset Provisions* (2019) (arguing that firms with dual class stock structure out-perform those without for more than seven years).

⁵⁸ See Goshen and Hamdani (2016).

⁵⁹ Note that the valuation for the high type drops from \$100 to \$60 when switching from dual to single-class. One may argue that this is a very steep drop. As the analysis will show, this assumption isn't as important. We could, for instance, change the high type's single class valuation to \$80 and the rest of the analysis will still go through. One could justify this assumption if we think that the high-type firm has a much larger opportunity to make long-term, non-verifiable investment compared to the low-type firm (which needs to focus more on short-term verifiable investments) and without such investments, much of the value for the high-type firm would be lost.

⁶⁰ Although we refer to these numbers as “firm valuation,” it would be more accurate to think of them as present value of future cash flows that is generated from the initial investment, i.e., an incremental value to the firm. We can assume that both types of firm have a common baseline valuation amount (like \$50) and the \$100 valuation stems from implementing the project. We will stay with the description of “firm valuation” to simplify the presentation.

⁶¹ The paper's arguments do not (directly) rely on the extraction of private benefits of control, but the analysis can be made consistent. We can, for instance, assume that with dual class stock, for the high-type firm, the value of private benefits is zero while for the low-type firm, the value is positive. See Choi (2018) for a more detailed analysis. In addition, for the low-type firm, the combined value (of private benefits and public valuation) is less than the total value of the firm with single class stock, so that the dual class stock structure is inefficient. For instance, when the low-type firm switches from single class stock to dual class stock, while the total firm valuation drops from \$70 to \$50, the founders' private benefit increase only from \$0 to \$10 (or anything less than \$20). Hence, when both the private benefits and the public valuation are added, single class stock structure is more efficient. See also Bebchuk (2003) and Barzuza (2018).

Table 1 summarizes the firm valuation numbers. We can think of these numbers as representing—and we will occasionally refer to them as—the firm’s “true,” “fundamental,” or “fair” values (in expectation). Note that, on average, the low-type firm has a lower fundamental valuation than the high-type firm (\$60 and \$70 versus \$60 and \$100). We assume that all the valuation numbers, along with the class structure chosen by the firm, are known also by the outside investors. We also assume that apart from the possibly different governance structure, other visible characteristics across these two types of firms are the same: e.g., they are operating in a similar industry with similar business models, they have comparable finance and accounting metrics, and so on.

B. Equilibrium under Complete Information

If the outside investors are fully aware of which type of firm is offering to sell its stock and observe the firm’s governance package, the IPO market will work efficiently and price the stock in accordance. Assuming that the founder wants to maximize the proceeds from the offering,⁶² for the high type firm, the optimal choice is to adopt a dual-class stock structure. By doing so, the firm will be able to sell its stock at \$100 valuation: to raise \$50, the firm will sell 50% of its ownership (in terms of cash flow rights) to the outside investors with a dual class structure.⁶³ Similarly, for the low-type firm, the optimal strategy is to adopt the single-class structure. By doing so, it will be able to sell its stock at \$70. To raise \$50, the low-type firm will offer to sell about 71.4% ($\approx \$50/\70) of its equity ownership to the outside investors. With complete information, the high-type firm adopts a dual class structure and sells 50% of its equity ownership (in terms of cash flow rights) while the low-type firm adopts the single class structure and sells about 71.4% of its equity ownership, and both firms raise \$50. The respective governance arrangements are optimal.⁶⁴ The results are summarized in Table 2.⁶⁵

Even with this simple, stylized example, a few important points are worth noting. First, with well-functioning market without the informational issues, once the outside investors’ required return is satisfied, the founder-controller (and other pre-IPO shareholders) become the (de facto) residual claimant of the firm. When the low type firm sells 71.4% of its equity to the outside investors to raise \$50, the founder-controllers will realize a return of \$20. As a residual claimant,

⁶² To the extent that the founder decides on what fraction of the firm to sell to the public and the firm’s governance feature (e.g., dual versus single class) and that the separation of cash flow right from control right can allow the founder to capture some private benefits of control, the founder would want to maximize the combination of the value of her retained shares and the value of future private benefits. Maximizing the combination may not necessarily be the same as maximizing the total firm value. See Choi (2018) for a more detailed analysis. Here, we are implicitly assuming here that the private benefits of control are lower for the high-type firm than the low-type firm and also that both types of founder would want to maximize the value of her shares (holding the fraction sold to the public roughly equal).

⁶³ In terms of IPO share price, if we assume that the firm is selling 50 shares while the pre-IPO shareholders are retaining 50 shares, each share will be offered and trade at \$1.

⁶⁴ There are two types of inefficiencies we can think about: the first that stems from adopting suboptimal governance structure and the other from mispricing (and possible misallocation of proceeds). While our focus is on the former, we will, on occasion, highlight the latter.

⁶⁵ If there are some firms that do not know what their optimal governance structure is (the “uninformed” type), assuming that the investors know that they are uninformed, they will choose the governance arrangement that produces the maximum average valuation. Given the valuation numbers in this example, they will choose dual-class structure and sell their equity at (average) \$80 valuation.

the founder-controller (and other pre-IPO shareholders) will maximize the total value of the firm, measured by both private benefits and public value. For instance, suppose by adopting dual-class stock, the founder-controller gets to realize \$5 of private benefits of control while the public valuation stays the same at \$60, whereas with single-class stock, there are no private benefits of control. Even with \$5 of private benefits of control, with complete information, the founder-controller still only gets \$15 of return by adopting dual-class structure, still less than \$20 of return she would have gotten with single-class structure.⁶⁶ That is, when the IPO market is working well, the founder-controller (and other pre-IPO shareholders) will have the right incentive to choose the optimal governance structure. We will see later (in Part IV), however, once the firm has chosen a suboptimal governance structure at IPO, even a small private benefits can create a lock-in effect, making it difficult for the firm to “undo” the suboptimal structure after the IPO.

	High Type	Low Type
Equilibrium Strategy	Dual-Class Stock	Single-Class Stock
Equilibrium Valuation	\$100	\$70
Optimal?	Yes	Yes
Capital Raised	\$50	\$50
Investors' Ownership	50%	71.4%

Table 2: Equilibrium under Complete Information

Second, it is easy to recognize that even if the valuation numbers were different, so long as the investors have all the information and correctly value the governance features, we again get the optimal result. Suppose, for instance, instead of the valuation numbers in Table 1, we have the numbers as shown in Table 3. In this variation, it is optimal for both firms to adopt the single-class structure: valuation numbers for the high-type firm (for either single-class or dual-class) have been flipped. Obviously, when the outside investors are aware which firm they are purchasing the stock from, the firm will choose the optimal governance structure. The high-type firm will choose the single-class structure and sell 50% of its equity at \$100 valuation, and the low-type firm will also choose the single-class structure and sell about 71.4% of its equity at \$70 valuation.

	High Type	Low Type
Dual Class Stock	\$60	\$60
Single Class Stock	\$100	\$70

Table 3: Firm Valuations under Homogeneity

Third, complete information, per se, does not lead to the conclusion that there will be much variation among firms in terms of their choice of governance package. That depends on what assumption we are making about which governance package is optimal for which firm (i.e., how they are “matched”). At the same time, it is likely that there will be variation in terms of valuation. This is the case even when most or all firms adopt the same or a similar governance package, some firms (the high type) will be valued higher than others (the low type). Now, what is interesting is that once we drop the assumption of complete information, it becomes more likely that the firms offer similar governance package to investors.

⁶⁶ So long as the private benefits of control (under dual-class structure) are less than \$10, the founder-controller will choose the single-class structure, which is optimal (when we take into account both the private benefits for the founder-controller and the public value of the firm).

C. Equilibrium under Heterogeneity and Asymmetric Information

Let us come back to the valuation numbers given in Table 1 and ask: what if the investors do not know which type of firm is offering the stock? More precisely, suppose that while the firm knows its type, the investors do not. It is easy to imagine that it is no longer guaranteed that the firm would adopt the optimal governance arrangement. Foremost, given the valuation numbers, a fully separating equilibrium (where the high-type and the low-type separate based either on governance structure, price, or both) is not possible. Suppose the high-type firm adopts a dual class stock while the low-type firm adopts a single class stock and the market values its respective stock in accordance. Can this equilibrium hold? The answer, unfortunately, is no. Given that the investors do not know whether they are facing a high-type or a low-type firm, now the low-type firm will have an incentive to mimic the high-type firm by (deviating and) also adopting the dual class structure. By doing so, it can increase its market valuation to \$100 and sell only 50% of its equity, as opposed to having to sell 71.4%.

Being able to sell a smaller fraction of the firm to the outside investors at a high valuation can be quite attractive for the founder (and other pre-IPO shareholders).⁶⁷ For the low-type firm's founder, with the single class structure, after selling 71.4% of its stock to the investors, the founder realizes a gain of \$20 ($\approx (28.6\%)(\$70)$). On the other hand, if it were to mimic the high-type and sell only 50% of its equity at (false) \$100 valuation (with dual class stock structure), the founder gets to realize \$30 ex post ($\approx (50\%)(\$60)$).⁶⁸ The outside investors, knowing the low-type firm's incentive to mimic would no longer be willing to value the dual-class firm at \$100.

1. Both Types Adopt Dual Class

When full separation is no longer feasible, one possible equilibrium is to have both types of firms to adopt a dual class structure (and offer the same fraction of the firm) when selling its stock to the public: a pooling equilibrium.⁶⁹ The investors, rationally expecting that both types of firms are pooling on the dual class structure, will value the firm, in accordance, at \$80 ($= (0.5)(\$100) + (0.5)(\$60)$). In order to raise \$50 for its investment, now the firm will have to sell about 62.5% of its equity ($\approx \$50/\80).⁷⁰ When the stock for both types with dual class structure is priced at \$80, neither the high-type nor the low-type firm will have an incentive to deviate from this equilibrium by switching to a single-class structure. By doing so, even under the

⁶⁷ Note that this is true even if the founder-controller is not enjoying any private benefits of control.

⁶⁸ Given that the true valuation of the low-type firm with dual-class structure is \$60, when the low-type firm mimics the high-type and the investors purchase 50% of its stock at (false) valuation of \$100, the investors are left with 50% of the firm that is worth \$60: the investors incur a loss of \$20.

⁶⁹ While we are focusing on a pooling equilibrium, a separating equilibrium is also possible but at a cost (efficiency loss). We discuss this issue in the next section.

⁷⁰ If we assume that some firms do not know what their optimal governance structure is ("uninformed" type), they will also pool with the others by adopting dual-class structure so as to avoid sending an adverse signal to the market and being penalized in valuation. For instance, suppose we divide the firms into three types: 40% know that they are high type ("informed high type"), 40% know that they are low type ("informed low type"), and 20% do not know but know that they are either high or low type with equal probabilities ("uninformed" type). In equilibrium, all three types will pool with dual-class structure and the average valuation numbers will be unaffected since the ratio of high to low types among the uninformed is the same as the ratio between informed high and informed low types.

most optimistic scenario,⁷¹ they will only realize \$70 of market valuation, which is lower than the \$80 firm valuation.⁷² Furthermore, we also cannot have an opposite separation, where the high-type firm adopts the single class stock while the low-type firm adopts the dual class stock. In that case, the low-type firm will have an incentive to deviate and switch to the single class stock, thereby increasing its market valuation from \$60 to \$70. In short, the pooling equilibrium where both types are offering their stock with dual class structure is robust. Table 3 shows this equilibrium.

	High Type	Low Type
Equilibrium Strategy	Dual-Class Stock	Dual-Class Stock
Equilibrium Valuation	\$80	\$80
Optimal?	Yes	No
Capital Raised	\$50	\$50
Investors' Ownership	62.5%	62.5%

Table 4: Pooling Equilibrium under Heterogeneity and Asymmetric Information

With the pooling equilibrium, we get the high-type firm being “under-valued” while the low-type firm gets “over-valued” in the IPO.⁷³ If we assume that, through the post-IPO secondary market trading, the prices will converge to their true valuations,⁷⁴ with respect to the high-type firm, the initial offer is underpriced and the firm valuation may ultimately converge to \$100 while for the low-type firm, the initial offer is overpriced and there’s subsequent decline in price, in the long run, to the firm valuation of \$60. If we think that the prices will relatively quickly converge to their true valuation after the IPO, the example also shows how “volatile” post-IPO trading can be.⁷⁵ Although in the example, both underpricing and overpricing are equally possible (and the respective magnitudes are the same), this is due to the assumption that the both types are equally likely. If we were to assume, instead, that the investors are 70% likely to face the high-type firm (and 30% likely to face the low-type firm), there will be much more underpricing and overpricing in equilibrium (70 to 30 ratio), and the magnitude of underpricing will be lower compared to that for overpricing.⁷⁶ The equilibrium initial offering valuation will be \$85 ($= (0.7)(\$100) + (0.3)(\$50)$).

⁷¹ What we mean by the phrase “even under the most optimistic scenario” is to assume that the public investors believe that the deviating firm is the low-type and be willing to value the firm at \$70.

⁷² Under the pooling equilibrium, after selling 62.5% of the firm at \$80 valuation, the low type firm founder-controller gets to realize \$22.5 ($\approx (0.375) \times (\$60)$), which is higher than what she would have gotten with single-class structure, which is \$20.

⁷³ In terms of the per share price, if we assume that each type of firm is offering about 62.5 shares to the public (out of total 100 shares), with the expected firm valuation of \$80, each share will be sold at about \$0.80 ($\$0.80 \times 62.5 \approx \50) at the IPO. However, assuming that the secondary market trading will eliminate this informational issue, for the high-type, the price will increase and converge to \$1 per share, while for the low-type firm, the price will decrease to \$0.50 per share.

⁷⁴ See Welch and Ritter (2002) on long-term under-performance of IPO stock. The empirical documentation of the long-term under-performance of IPO stock also raises an interesting question about whether the second market is working well with respect to the IPO stock, compared to others that have been trading on the market for some time.

⁷⁵ See Corrigan (2019) at 348—351 (describing post-IPO price volatility).

⁷⁶ See Lowry, Officer, and Schwert (2010) (showing how about one-third of IPOs in a sample from 1965 through 2005 had a negative return, measured over twenty days after the IPO). The presence of a pricing volatility, in general, is an indication the difficulty of valuing IPO shares which, in turn, can lead to a higher potential for market failure (such as the pooling equilibrium we are describing). *Id.* at 427.

More importantly, to the extent that the post-IPO secondary market can reveal more information about the firm (and its optimal governance structure), this can potentially present an opportunity for the market to “correct” or “undo” the initial, inefficient governance structure sometime after the IPO.⁷⁷ Although a firm presumably always has a choice to rearrange its governance structure anytime, at its IPO, it may opt into an arrangement that could facilitate such rearrangement *ex post*. A sunset provision that allows (or even requires) the shareholders to undo dual-class structure after the IPO is one such mechanism. At the same time, as discussed briefly earlier, there could also be potential lock-in effect from the IPO that could make it difficult for the firm to revisit the governance structure. We will discuss this issue in more detail in Part IV.

Before we proceed, one important point to note here is that even though the market is inefficient (at least for a subset of firms), the outside investors, at least in expectation, are not being harmed. They are valuing the firm rationally given all the information they have and when we compared the outside investors’ expected return in this inefficient pooling equilibrium to that in a complete information setting, the expected returns are the same. So, the market inefficiency does not imply that the outside investors are somehow being hurt. With incomplete information, though, what is happening is cross-subsidization. The high-type firm is “subsidizing” low-type firm (or vice versa, depending on the valuation numbers) through average valuation and though the outside investors realize a loss with respect to the low-type firm that negative return is being made up through a positive return on the high-type firm. This feature, where the rational, outside investors recover their cost of capital (in expectation) despite the inefficiency will be common throughout the analysis.

2. Both Types Adopt Single Class

What made the pooling equilibrium, where both types adopt a dual class structure, fairly robust was the fact that the firms’ average valuation of \$80 was higher than either firm’s true valuation under single-class structure (\$60 for the high-type and \$70 for the low-type). If the firm’s valuation is higher under the single-class structure, we may get an equilibrium where both types adopt the single-class structure. Suppose the valuation with single-class stock is \$80 for the high-type and \$90 for the low-type. These numbers are shown in Table 5. Note that, compared to the earlier scenario, we have only increased the firm valuation numbers under single class structure.

	High Type	Low Type
Dual Class Stock	\$100	\$60
Single Class Stock	\$80	\$90

Table 5: Firm Valuations under Heterogeneity: Variation

⁷⁷ If the investors believe that the post-IPO trading will allow the market to reveal the true valuation of the firm, and relatively quickly, at least in theory, the high-type firm can utilize a security that relies on such *ex post* information, such as a contingent valuation right (CVR) or a warrant. Although such contingent rights are occasionally used in certain M&A transactions, potentially to deal with the informational issues, we are not aware of the use in an IPO setting. See Albert H. Choi, *Facilitating Mergers and Acquisitions with Earnouts and Purchase Price Adjustments*, 2 *Journal of Law, Finance, and Accounting* 1 (2017) (demonstrating how earnout and purchase price adjustment mechanisms can alleviate the problems of information asymmetry or non-convergent priors in M&A transactions).

In this case, it would be no longer desirable for both types of firm to adopt dual-class structure. By doing so, they will get the (average) valuation of \$80. However, obviously, from both types' perspective, they can potentially increase the stock price (and firm valuation) by switching to a single-class structure: deviation has become profitable. At the same time, just as in the previous example, we cannot have a fully separating equilibrium where only the high-type firm adopts the dual-class stock while the low-type firm adopts the single-class structure. If that were the case, the low-type firm will again have an incentive to switch to dual-class stock so as to get the valuation of \$100, instead of \$90. In equilibrium, both types of firms will offer their stock with a single-class structure with the average firm valuation of \$85.⁷⁸ What is interesting about this example is that, unlike the previous example, in this scenario, now, the high-type firm is the one with a suboptimal governance structure.⁷⁹ The equilibrium is shown in Table 6.

	High Type	Low Type
Equilibrium Strategy	Single-Class Stock	Single-Class Stock
Equilibrium Valuation	\$85	\$85
Optimal?	No	Yes
Capital Raised	\$50	\$50
Investors' Ownership	58.8%	58.8%

Table 6: Pooling Equilibrium under Heterogeneity and Asymmetric Information

Setting aside the fact that the high-type firm is adopting an inefficient governance structure, compared to the initial example where both types were adopting the dual class structure, in this example, the IPO market is more accurately pricing the stock offered by both types of firms. With the assumption that the valuation gap between the types is narrower, the size of underpricing and overpricing is relatively small.⁸⁰ At the same time, compared to the earlier case, now, the high-type firm is being overpriced while the low-type firm is being underpriced at IPO.⁸¹ If we were to assume that, through the post-IPO secondary market trading, the stock price will converge to their true valuation, the high-type firm's valuation will decrease to \$80 while the low-type firm's valuation will increase to \$90.⁸²

⁷⁸ To raise \$50, each type of firm will sell about 58.8% ($\approx \$50/\85) of its total equity.

⁷⁹ With respect to the investors' off-the-equilibrium belief, if they were to "naively" believe that the dual class structure is coming from the high-type type and are willing to pay \$100 for the stock, the pooling equilibrium will fall apart. This is briefly mentioned in the first paragraph of this section. This "naïve" off-the-equilibrium belief will not survive a refinement (such as the intuitive criterion), however, since the low-type firm will also have a strong incentive to deviate. One plausible off-the-equilibrium belief is for the investors to believe that any dual class structure is equally likely to come from either the high-type or the low-type and, with the belief, they are willing to pay \$75 for the firm. With this off-the-equilibrium belief, the pooling equilibrium is sustained.

⁸⁰ This, of course, assumes that the valuations for both types under the single class structure is roughly equal. If there is a meaningful difference in valuations, assuming that the secondary trading reveals more information about the firm, prices will diverge after the IPO.

⁸¹ This is based on the assumption that the high type's valuation (with single-class structure) is \$80 while the low type's valuation is \$90. If we were to change those numbers to \$90 for the high type and \$80 for the low type, we will again have underpricing for the high type and overpricing for the low type.

⁸² If we assume that both types are offering about 58.8 shares to the public (out of 100 total shares) to raise \$50, the IPO price will be about \$0.85 ($\approx \$50/58.8$). Through the secondary trading, the high-type firm's share price will decrease and converge to \$0.80 while the low-type firm's stock price will increase to \$0.90.

D. Equilibrium under Homogeneity and Asymmetric Information

Why do firms not adopt the optimal governance structure at the initial public offering? The problem here stems from two sources. First, the outside investors are unaware of which type of firm they are facing when they are participating in the initial public offering market. The firms, on the other hand, know (or are much better aware of) their type. This is the problem of information asymmetry. Second, perhaps equally important, is the assumption that different firms have different optimal governance structure. Not one governance size is optimal for all firm types. If we were to retain the assumption of asymmetric information but relax the heterogeneity assumption, we can again get an equilibrium that is efficient (at least from the governance perspective).⁸³

	High Type	Low Type
Equilibrium Strategy	Single-Class Stock	Single-Class Stock
Equilibrium Valuation	\$85	\$85
Optimal?	Yes	Yes
Capital Raised	\$50	\$50
Investors' Ownership	58.8%	58.8%

Table 7: Equilibrium under Homogeneity and Asymmetric Information

From the example, suppose we assume that the valuation numbers are given as in Table 2. Recall that, under this scenario, while there are some variations in market valuations, single class structure is optimal for both types of firms. It is easy to see that, in this case, both types will adopt the optimal governance structure of having a single class of stock. There will still be some mispricing though.⁸⁴ When the investors observe the firm offering its stock with a single class structure, given that they do not know which type they are facing, they will value the stock at \$85 ($= (0.5)(\$100) + (0.5)(\$70)$). The high-type firm is being under-valued while the low-type firm is being overvalued. Nonetheless, the governance structure chosen by the firms is optimal. With the valuation of \$85, neither type will want to deviate. To see this, even if we were to assume that the investors believe that the firm is offering dual class structure instead is a high-type, the deviating firm can only get the valuation of \$70. Hence, there is no incentive to deviate.⁸⁵ Finally, we can see that, even if the numbers were flipped so that both types of firms would have a higher valuation under the dual class structure, both types will offer dual class structure: the equilibrium would still be optimal. The equilibrium is summarized in Table 7.

⁸³ Inefficiency from mispricing will still persist.

⁸⁴ With the mispricing, there would also be some investment inefficiency. In the current example, the firm is either selling too large or too small a fraction of its equity to the public. If the firm is selling too large a fraction, potentially this could prohibit the firm from engaging in future round of financing. Furthermore, the insiders (including founder-controller) may be retaining too little "skin in the game" so as to care about the firm's long-term health.

⁸⁵ In this example, pooling equilibrium where both types are choosing single class structure is possible because deviation (with any plausible off-the-equilibrium belief by the investors) is not attractive. In other circumstances, this may no longer be true. Suppose we start from Table 2 but increase high-type's valuation with dual class to \$85 while reducing the low-type's valuation with single class to \$60. Even with the new numbers, it is still optimal for both firms to choose single class. However, that pooling equilibrium may no longer be stable, unless the investors are willing to "punish" the deviators substantially. On the equilibrium path, both types of firms will sell, with single class structure, at \$80. But, obviously, the high-type will now have an incentive to deviate to dual class stock so long as the investors put sufficiently high belief on the fact that the deviator is a high-type firm rather than a low-type firm.

III. Potential Countervailing Forces: Some Complications

So far, we have shown how the presence of informational issues and the heterogeneity in optimal governance structure can lead to suboptimal governance structure (at least for some firms). In this part, we analyze whether such inefficiency can be mitigated or eliminated with the help of two important mechanisms. The first is the private ordering mechanism that could potentially allow the high-type firm to engage in sending a “costly signal” to the market so as to achieve better pricing and separation. The second is the potential liability that the low-type firm (and perhaps even the high-type firm) can face for potential, material misrepresentation or omission to the IPO investors. The analysis will show that while such private ordering and litigation mechanisms can be important tools in incentivizing firms to adopt optimal governance structure, in many cases, they may be insufficient.

A. Costly Signaling Mechanisms

Suppose we go back to the valuation numbers used in Table 1 along with the assumption that the IPO investors do not observe which type of firm they are facing when they are making their investment decision. As we saw earlier, it is likely in that setting, both types of firms will offer the same governance package of dual class stock and both will sell their stock at \$75. The results were shown in Table 3. Although the IPO investors are not suffering any losses (on average) the equilibrium exhibited two kinds of inefficiency: a governance inefficiency that results from the low-type firm using dual class stock and an investment inefficiency that results from mispricing (too much proceeds to the low-type firm and too little proceeds to the high-type firm).

Can the high-type firm, in such a setting, somehow “signal” its type to the investors so as to separate itself from the low-type? There may be certain mechanisms that the high-type firm may be able to utilize. One possibility is to engage in more costly disclosure. To the extent that a firm that is going public can disclose more credible, positive information to the potential investors, such disclosure can function as a signal to the investors about the quality of the firm.⁸⁶ Another possibility is through relying more on high quality financial and legal advisors.⁸⁷ One can imagine that retaining high-quality advisors can potentially send a signal to the market about the quality of the offering. Still other possibility is through voluntarily retaining a large block of stock. By exposing oneself to a higher post-IPO risk, a founder can also attempt to signal to the market about

⁸⁶ At the same time, with respect to certain types of information, there may be limits on whether a firm can, in fact, make a credible disclosure to the outside investors. If the founder-controller wants to “commit for the long-term,” stay “innovative,” or implement her “idiosyncratic” vision, disclosing such “soft” information (though important) may not convey any information to the outside investors. If the type of information that the investors need is “soft,” informational issues may become more difficult to overcome and other, more credible mechanisms become necessary. Some of such mechanisms are analyzed in this part. See also Part III.B *infra* on the difficulty of implementing post-IPO liability regime in the presence of “soft” information.

⁸⁷ See Hsuan-Chi Chen and Jay Ritter, *The Seven Percent Solution*, 55 *Journal of Finance* 1105 (2000) (showing that more than 90 percent of IPOs raising \$20 to \$80 million have spreads exactly seven percent as compensation for the underwriters) and Robert Hansen, *Do Investment Banks Compete in IPOs?: The Advent of the ‘7% Plus Contract,’* 59 *Journal of Financial Economics* 313 (2001) (arguing that 7% contract is not the result of a collusion among underwriters and 7% does not lead to an abnormal profit). See also Coates (2001) and Aggarwal, Choi, and Eldar (2020) (showing variations among IPO firms depending on the law firms and venture capital firms).

the quality of the equity offering.⁸⁸ While there are many different ways to reflect costly signaling, here we focus on three possibilities: (1) relying on costly underwriter as a credible signal; (2) pledging some personal assets to cover some of the investment cost; and (3) deliberate underpricing.

1. Reliance on Costly but Reputable Advisors

One possible way that the high-type firm can attempt to separate itself from the low-type is by relying on costly but reputable agents, such as reputable underwriters and legal advisers. One can imagine that a reputable underwriter, for instance, can get a much more accurate understanding of the business and investment model of the firm and its future cash flow projections, and employing them at cost can send a credible signal to the market that the firm is adopting the optimal governance structure to maximize the future cash flows.⁸⁹ Let's come back to the valuation numbers that are given in Table 1, along with the assumption that the investors cannot tell which type of firm is selling its equity. As we saw earlier, one possible equilibrium was for both types of firm to pool by adopting the dual class stock and offer 62.5% of its equity to the investors at the (average) firm valuation of \$80 to raise \$50 necessary for investment.

Now suppose that a firm can hire a set of advisors who can accurately “verify” the firm’s business and investment model and (better) predict its future cash flows. Suppose that employing them to manage the IPO process will cost the firm \$10.⁹⁰ Obviously, from the low-type firm’s perspective, it does not make sense to spend \$10 to hire the advisors simply to tell the market that its firm valuation is either \$60 (with dual class stock) or \$70 (with single class stock). For the high-type firm, however, engaging in this costly verification mechanism can make sense. Suppose, by spending \$10 on the advisors, it can credibly signal to the market that, with dual class stock, its valuation is \$100. Suppose also that the compensation for the advisors is done through IPO share allocation. For the high-type firm, with the help of the underwriter, it credibly signals to the investors that its valuation is \$100, sell 50% of its stock at \$100 to raise \$50 fund necessary for the investment, and also give 10% of its stock to the underwriter as advisory fee.⁹¹ Since the founder (along with other pre-IPO shareholders) is retaining 40% of the firm’s equity, the return for the founder is \$40 ($= (0.4)(\$100)$). At the same time, the low-type firm will simply choose the single class structure, and without the help of the advisors, sell about 71.4% ($\approx \$50/\70) of its equity at \$70 valuation. We get a complete separation.

⁸⁸ See Hayne Leland and David Pyle, Informational Asymmetries, Financial Structure, and Financial Intermediation, 32 *Journal of Finance* 371 (1977) for a class treatment on this issue. Another important device used often is a lock-up agreement that contractually prohibits certain insiders (including the founders, underwriters, and venture capitalists) from selling their stock for a certain period of time (typically for 180 days) after the IPO.

⁸⁹ This mechanism may partly driven by the potential liability that the underwriter can face for material misrepresentation or omission. See generally, Reinier Kraakman, Gatekeepers: The Anatomy of a Third-Party Enforcement Strategy, 2 *Journal of Law, Economics, and Organization* 53 (1986) (analyzing conditions under which holding gatekeepers liable can achieve better deterrence).

⁹⁰ For the high-type firm, this is 10% of its equity and is obviously quite high. We are using these numbers to simplify the analysis. In the example, we are also assuming that the firm has an option not to use an advisor (underwriter). This is to simplify the analysis. What is more important is whether a reputable advisor (who can better “verify” the valuations) is more costly than a non-reputable one.

⁹¹ Another way to structure this is to have a firm commitment contract with the underwriter to sell 60% of the stock, the underwriter purchases the stock at \$50, and the underwriter turns around and sells it to the public at \$60, keeping the \$10 difference as its compensation. See Corrigan (2019) at 344–348 (describing the IPO underwriting process).

Had the high-type firm not engaged in this costly verification mechanism (using the expensive advisors), under the pooling equilibrium, the firm would have sold 62.5% of its equity at (average) valuation of \$80 and the founder (and other pre-IPO shareholders) would be left with their equity that is worth \$37.5. Clearly, it makes sense for the high-type firm to rely on costly underwriters to eliminate the informational issues. At the same time, if the advisory fee gets too high, the high-type firm would rather pool with the low-type. If the high-type firm had to allocate 15% of its stock (instead of 10%) to the underwriter, for instance, since the founder will be left only with 35% of the firm, which is worth \$35, this would be worse than being pooled with the low-type.⁹²

Furthermore, while the costly signaling mechanism may better allocate capital to both types of firm, it has its own cost. One is the cost of underwriting, to the extent that the \$10 advisory fee does not generate any other efficiency benefit. The other is possible agency cost that stems from having to use a set of advisors, they may attempt to pursue an interest that diverges from the firm's interests.⁹³ Still other is potential inefficiency is through "over-signaling." With the pooling equilibrium, the efficiency loss was created when the low-type firm was adopting a suboptimal governance structure (of dual class stock), which reduced its valuation from \$70 to \$60. Given that, under full separation, the low-type firm gets to adopt the optimal governance structure, the increase in efficiency benefit, with the assumed numbers, is \$10. In other words, \$10 is being spent as costly verification to generate \$10 of additional efficiency and there is no net efficiency gain. If, for instance, the advisory fee were \$12, the high-type firm will still utilize their service to separate itself from the low-type, but this will create an efficiency loss.⁹⁴

2. Reliance on Internal Capital Markets

Another way the high-type firm can credibly separate itself from the low-type firm is by using more of the internal capital and lessening the need for external capital. By relying more on the internal, personal investment, the founder-controller, with more "skin in the game," can send a credible signal to the market about the quality of its investment (along with sanguine prospects of future cash flow) and how the firm's choice over governance structure is optimal. It also lessens the reliance on less informative investors ("blind" money). So long as the amount of reliance on external financing is relatively small (or conversely, the amount of "skin in the game" is relatively high), the better quality firm will be able to separate itself from the herd.

To see this, suppose, as earlier, the firm needs to raise \$50 for its investment. However, out of \$50, now the insiders (the founder-controller and other pre-IPO shareholders) need to contribute \$30, thereby lowering the amount of public financing from \$50 to \$20. The valuation numbers are the same as before (Table 1). If the low-type firm were to separate itself using a

⁹² The break-even point, in terms of allocation for the underwriter, is 12.5% in the example.

⁹³ See Chen and Ritter (2000) and Ritter (2011) (arguing that the underwriters' incentive to underprice excessively and the lack of competition among underwriters are important drivers in IPO underpricing and other types of inefficiency). But see Hansen (2001).

⁹⁴ For an earlier work on inefficient signaling, see Philippe Aghion and Benjamin Hermalin, *Legal Restrictions on Private Contracts Can Enhance Efficiency*, 6 *Journal of Law, Economics, and Organization* 381 (1990) (demonstrating that, under certain circumstances, private parties may have too much incentive to engage in costly signaling and restricting or eliminating such an option can actually improve welfare).

single class structure, the investors will value the firm at \$70. To get \$20 of external financing, the low-type will need to sell about 28.6% ($\approx \$20/\70) and retain about 71.4% ($\approx \$50/\70) of its equity. Given that the founder-controller also needs to put in \$30 of personal capital for the investment,⁹⁵ the founder-controller will realize a net return of about \$20 ($= (71.4\%) \times (\$70) - \30). At the same time, suppose the high-type sells 20% of its equity (with dual class structure) at valuation of \$100 and realize a net return of \$50 ($= (80\%) \times (\$100) - \30).

With a large fraction of fund-raising coming from the insiders, it is straightforward to see that the low-type firm will no longer have an incentive to mimic the high-type firm. Had it done so (by adopting dual class stock and selling 20% of the firm at (the investors' perceived) valuation of \$100), the low-type founder-controller would have made a net return of \$18 ($= (80\%) \times (\$60) - \30), which is lower than what the founder-controller would have gotten had it adopted the single class structure and sold about 71.4% of the firm at \$70 valuation. In fact, once the firm realizes that it can finance the investment at an accurate valuation, the low-type firm will be indifferent as to the amount of outside financing. We can, for simplicity, assume that the low-type will now rely entirely on outside financing, as shown in Table 8.

	High Type	Low Type
Equilibrium Strategy	Double-Class Stock	Single-Class Stock
Equilibrium Valuation	\$100	\$70
Optimal?	Yes	Yes
Internal Capital	\$30	\$0
Capital Raised	\$20	\$50
Investors' Ownership	20%	71.4%

Table 8: Equilibrium with Internal Capital

In short, by reducing the reliance on external financing (which is prone to informational issues) and increasing her “skin in the game,” the high-type firm can credibly separate itself from the low-type. At the same time, this strategy may require a substantial amount of internal investment. If, for instance, the founder-controller needs to raise \$40 with only \$10 of personal investment, the high-type firm will no longer be able to separate itself from the low-type:⁹⁶ the need for external financing is too great and the costly signal sent through personal investment is too weak.

3. Deliberate Underpricing

The third costly signaling possibility we consider is through deliberate underpricing. We have already seen that, with the valuation numbers given in Table 1, when both types of firm offer to sell their stock at \$80 valuation with dual class structure, there already was underpricing for the high-type (whose true valuation is \$100) while overpricing for the low-type (with \$60 true valuation). One important strategy that was taken as given was pricing. Throughout the examples,

⁹⁵ We are assuming here that the founder-controller can credibly commit to putting in her personal assets for the investment at the time of the IPO.

⁹⁶ In this case, by being truthful, the low-type will still realize a net return of \$20. By mimicking the high-type (who sells 40% of its stock at \$100 valuation), however, the low-type will be able to realize a net return of \$26 ($= (60\%) \times (\$60) - \10).

once the outside investors' belief about the firm's valuation is determined, the IPO pricing was done simply to make sure that the outside investors break even. This (implicit) assumption, of course, is a simplification and in reality, the firm going through an IPO has the option of pricing their shares below what the outside investors are willing to pay (based on their beliefs about the firm valuation).

When the amount of internal investment necessary is sufficiently large (but not large enough to induce separation on its own), the high-type firm may be able to separate itself from the low-type by deliberately underpricing its shares. Intuitively, as the amount of underpricing gets larger (or, more accurately, as the fraction of firm sold to the outside investors to raise a fixed amount of capital gets larger), sooner or later the low-type firm, with a poorer investment prospects, will no longer find it worthwhile to mimic the high-type firm. In a sense, underpricing ends up being more costly for the low-type firm than the high-type firm, and the high-type firm would be willing to make this sacrifice so as not to be pooled with the low-type.

To examine this issue more concretely, suppose, again, we adopt the valuation numbers that are given in Table 1, with the assumption that the outside investors cannot tell the firm apart. In contrast to the earlier example, however, now suppose that the total amount of investment necessary is \$65 and the firm needs to raise \$35 from the capital market while internally supplying \$30.⁹⁷ Note that, with \$65 total investment, the low-type firm in our example should engage in financing and investment if it uses the single class structure but not with a dual class structure. If the low-type firm were to pool with the high-type using a dual class structure, given that its valuation is only \$60, investing \$65 will lead to an efficiency loss. With \$70 valuation under a single class structure, the investment of \$65 will generate a \$5 of surplus.

	High Type	Low Type
Equilibrium Strategy	Double-Class Stock	Single-Class Stock
Equilibrium Valuation	\$100	\$70
Optimal?	Yes	Yes
Internal Capital	\$30	\$30
Capital Raised	\$35	\$35
Investors' Ownership	42%	50%
Underpricing	83%	100%

Table 9: Equilibrium with Underpricing

Even with a substantial amount of personal investment (of \$30), this is insufficient to eliminate the incentive for the low-type firm to mimic the high-type firm. Suppose the high-type firm is offering 35% of its stock to the outside investors at \$100 valuation. If the low-type firm were to mimic and offer the same terms to the outside investors, even with \$30 of internal (personal) investment, by retaining 65% of the firm that is worth \$60, the low-type founder-controller will

⁹⁷ The example here builds on the work by Jean Tirole, *The Theory of Corporate Finance* 262 (2006). In Tirole's analysis, there is no corporate governance dimension, and the low-type firm should be kept away from the IPO market altogether, while in our setup the low-type firm should be encouraged to sell its shares using a single class stock structure. See also Ivo Welch, *Seasoned Offerings, Imitation Costs, and the Underpricing of Initial Public Offerings*, 44 *Journal of Finance* 421 (1989) (analytically demonstrating how a high-quality firm will deliberately underprice its IPO shares so as to take advantage of more favorable subsequent, seasoned offering).

realize a net return of \$9 ($= (0.65) \times \$60 - \30). If the low-type firm were to offer to sell 50% of its stock (with a single class structure) to the outside investors to raise \$35 with firm valuation of \$70, the low-type firm will realize a net return of \$5 ($= (0.5) \times (\$70) - \30). Clearly, for the low-type firm, mimicking the high-type firm (using dual class stock) is more profitable.⁹⁸

In order to eliminate the low-type firm's incentive to also offer dual class stock and the same fraction of equity like the high-type firm, the high-type firm, when offering stock at \$100 valuation, can deliberately choose to underprice its stock. That is, it can deliberately choose to offer more than 35% of the firm to the outside investors to raise \$35. To see this, suppose the high-type firm were to offer, using dual class stock, 42% of its firm to the public in return for \$35 of investment. Suppose also that the investors believe that it is the high-type firm that is making this offer. Will this belief be supported by the low-type firm's behavior? As we saw earlier, had the low-type firm simply stuck with a single-class structure and offered to sell 50% of its stock at \$70 firm valuation, the low-type firm would have realized a net return of \$5. What if the low-type firm were to try to mimic the high-type firm by also offering 42% of its stock at (false) \$100 firm valuation?⁹⁹ By retaining 58% of its equity, after making its own \$30 investment, the low-type firm will realize a net return of \$4.8 ($= (0.58) \times (\$60) - \30). (The high-type, by comparison, realizes a net return of \$28 ($= (0.58) \times (\$100) - \30 .) Unlike the earlier case, now, the low-type's incentive to mimic the high-type has been eliminated.

In equilibrium, the high-type firm will offer to sell 42% of its stock (with dual class) to raise \$35 while the low-type firm will issue 50% of its stock (with single class) to raise the same amount. In terms of the share price, if we assume that the high-type firm is selling 42 shares while retaining 58 shares (out of 100 total shares), given the proceeds of \$35, the initial share price will be about \$0.83 ($\approx \$35/42$). If we were to assume that the post-IPO secondary trading will bring the share price to its true value, ultimately the share price will rise to \$1 per share. If we think that the share price will jump to \$1 immediately after the IPO, there is roughly about 20% underpricing ($\approx 1/0.83 - 1$) for the high-type firm.¹⁰⁰ Also, though the low type firm's stock is not underpriced at its IPO, with high type firm's underpricing, there will also be, on average, about 10% underpricing across both types.

B. Post-IPO Liability

So far, we have examined the possible "private ordering" solutions that the high-type firm can engage in to eliminate the incentive of the low-type firm to mimic and create an inefficient equilibrium. Another important, mandatory mechanism is for the investors (and the regulatory

⁹⁸ At the same time, a complete pooling equilibrium, under which both types offer to sell about 43.8% ($\approx 35/80$) to the public investors using dual class stock is not feasible, either. In that scenario, the low-type firm will realize (after \$30 of personal investment) a net return of \$3.75 ($\approx (45/80) \times (\$60) - \$30$). The equilibrium will be partial pooling, under which the low-type firm will "mix" between offering dual class stock and single class stock and the outside investors will value the dual class firm based on the low-type firm's mixing probability.

⁹⁹ More precisely, in order to deter the low-type firm from mimicking, the high-type firm needs to retain fraction α such that $\alpha(\$60) - \$30 \leq \$5$. When we solve for α , we get $\alpha = 35/60 \approx 58.3\%$. The fraction retained is set so as to give too little return to the low-type to recoup its personal investment (of \$30).

¹⁰⁰ Given that the outside investors rationally expect the share to be worth \$1, when the shares are initially offered at \$0.83, there will be excess demand from the investors and, with excess demand, there will be some rationing (possibly managed by the underwriter).

authority) to hold a firm liable for material misrepresentation or omission to the outside investors when going through an IPO.¹⁰¹ Under the existing regulation, the IPO investors can recover compensatory damages from the firm when they can show that the IPO documents, such as the registration statement and the prospectus, contained material misrepresentation or omission. In particular, when the share price drops below the initial offering price, the outside investors can be entitled to the difference between the initial public offering price and the market price (or the sale price in case the shares have been sold) as compensatory damages. Scholars have emphasized the importance of such liability system as a potential deterrent against material misrepresentation (and omission) and also as a possible reason for underpricing.¹⁰²

In our initial example (from Table 1), when both types of firm sold 62.5% of its equity (= \$50/\$80) at average firm valuation of \$80 (with dual class structure), we saw that this led to an underpricing of the high-type firm's stock while an overpricing of the low-type firm's stock. If we assume that the stock price will converge to their fundamental value after the IPO, the low-type firm stock's downward drift can expose the firm to a potential litigation risk. That risk, in turn, can reduce the low-type firm's incentive to mimic the high-type firm in the first place. When the liability system is sufficiently costless and accurate, such an inefficient incentive can be eliminated altogether.¹⁰³ What is different about the liability system in this area, however, is that the damages are being paid by the firm and the plaintiffs are the residual, equity owners of the firm which means that the plaintiffs get to partially bear the cost of the damages and this will reduce the deterrence effect of the liability system. The larger the equity fraction sold to the investors, the bigger the reduction in deterrence effect. When the financing needs are relatively large, compensatory damages paid by the firm will no longer achieve the desired deterrence.

To see this, suppose we come back to the initial setup (Table 1) but with a slight variation: instead of having to raise \$50 from the outside investors, the firm now needs to raise only \$40. If the low-type firm were to issue its stock using single class structure, the firm will offer to sell about 57.1% ($\approx \$40/\70) of its equity (with the founder-controller retaining about 42.9%) and the founder-controller will realize a return of \$30 ($\approx (42.9\%) \times \70). If the high-type were to offer 40% of its equity at \$100 valuation (with dual class stock), will the low-type mimic? In this case, the liability system is strong enough to create the necessary deterrence. Suppose the low-type firm were to also offer to sell 40% of its equity by adopting dual class stock at (false) firm valuation of \$100 and raise \$40. The founder-controller will expect that when the firm value drops to \$60 after the IPO, the firm will have to pay compensatory damages of \$16, which represents the difference between how much the 40% of the equity was valued at the IPO and the post-IPO valuation ($= (0.4) \times (\$100 - \$60)$). After paying the damages of \$16, for the founder-controller, who owns 60% of the firm, the value of her ownership fraction is \$26.4 ($= (0.6) \times (\$60 - \$16)$). This is

¹⁰¹ There also is a lively debate over whether the post-IPO liability should also be mandatory and whether firms should be able to "manage" the liability system through private ordering (such as an individual mandatory arbitration provision in charters). See Scott and Silverman (2013) and Albert H. Choi and Kathryn Spier, *Liability for Non-Disclosure in Equity Financing*, working paper (2022) for more detailed discussion.

¹⁰² See Patricia Hughes and Anjan Thakor, *Litigation Risk, Intermediation, and the Underpricing of Initial Public Offerings*, 5 *Review of Financial Studies* 709 (1992) (analytically examining what type of litigation risk can lead to IPO underpricing) and Janet Alexander, *The Lawsuit Avoidance Theory of Why Initial Public Offerings Are Underpriced*, 41 *UCLA Law Review* 17 (1993) (arguing that once the substantive law is considered, lawsuit avoidance theory of IPO underpricing is less convincing).

¹⁰³ The following discussion is based on Choi and Spier (2022).

less than what the founder-controller would have gotten under the single class structure (and the correct firm valuation of \$70). The liability system that relies on compensatory damages from the firm is strong enough to achieve the necessary deterrence.¹⁰⁴ Table 10 summarizes the result.

Note, however, that when the firm pays the compensatory damages (\$16) to the outside investors, the founder-controller (and other pre-IPO shareholders) do not bear the entire cost of damages. The founder-controller gets to pay only 60% through the reduction in the value of her ownership (\$9.6). The other 40% of the damages (\$6.4) are born by the outside investors who are now shareholders of the firm. The liability system is under-compensatory for the investors. Even if the outside investors were to sell their stock before bringing suit so that they no longer remain as shareholders at the time of the lawsuit, so long as the capital market is sufficiently forward-looking, the share price will reflect the value of the firm liability and the original investors will have to bear the cost through the reduction in sale price. In the example, when the capital market rationally expects the future liability (of \$16) on the firm, the market will value the 40% of the firm's equity at \$17.6 ($= (0.4) \times (\$60 - \$16)$). If the outside investors were to sell their ownership fraction at \$17.6, after collecting \$16 as compensatory damages from the firm, their return is \$33.6, still less than the initial \$40 of investment they made at the IPO. The difference of \$6.4 now reflects a fraction of the compensatory damages born by the outside investors through the reduction in the share price ($= (0.4) \times (\$16)$).¹⁰⁵

	Dual-Class Stock	Single-Class Stock
Valuation	\$100	\$70
Fraction Sold	40%	57%
Compensatory Damages	\$16	\$0
Founder's Return	\$26.4	\$30

Table 10: Post-IPO Liability against Low Type

What this implies is that, as the fraction of the firm sold to the outside investors gets larger, the size of this under-compensation will get bigger, potentially undermining the necessary deterrence. For instance, in our example, it is fairly straightforward to show that if the firm were to try to raise \$60, because the outside investors get to own 60% of the firm (with \$100 valuation), even with “full” compensatory damages paid by the firm, the low-type firm will no longer be deterred from adopting dual class stock and trying to sell its shares at \$100 valuation.¹⁰⁶ If we were to achieve the desired deterrence with the firm paying damages, punitive damages may actually be necessary. Another possibility is to hold the founder-controller personally liable.

In addition to the under-compensatory feature of the liability system, there are a few other obstacles to achieving full deterrence. The first is the efficiency and accuracy of the post-IPO

¹⁰⁴ What the numerical example also demonstrates is that the liability system does not lead to underpricing. This depends on the assumption that the liability system is fairly accurate (even if there are some errors) in determining whether a wrong-doing actually occurred. See Choi and Spier (2022). This is also consistent with the analysis in Hughes and Thakor (1993).

¹⁰⁵ In a sense, the founder-controller is imposing a negative externality on the outside investors when the firm pays compensatory damages.

¹⁰⁶ See Choi and Spier (2022) for a more detailed analysis. If we were to achieve the necessary deterrence, one possibility is impose punitive damages on the firm. Another possibility is to hold the founder-controller (perhaps with other pre-IPO shareholders) personally liable.

secondary market. Once the shares start trading post-IPO, unlike in the IPO setting where the firm gets to dictate the initial price, the market presumably can aggregate investors' information to better determine the "fundamental" value of the shares. In particular, investors who are bearish on stock can even take a short position against the stock so as to bet against the rise of the stock price.¹⁰⁷ At the same time, there also is reason to think that the post-IPO market isn't as efficient as the market for securities that have been trading for a long time. The phenomenon of under-performance, at least in the medium-term, of IPO stock seems to support this skepticism.¹⁰⁸ A related problem is the source and supply of information in the secondary market. After the IPO, at least until the firm needs to file its earnings statement with the SEC, which can take some time, the secondary market may not be able to update its valuation estimates on the firm and this can further reduce the speed with which the stock price will converge to its fundamental value.

The second reason has to do with the type of information that is being disclosed or omitted by the firm. To be able to bring a successful private lawsuit against the low-type firm, the investor-plaintiffs will have to demonstrate whether, in fact, there was a material misrepresentation or material omission by the firm. While it may be true that, in certain cases, the investor-plaintiffs may be able to uncover some hard evidence on misrepresentation or omission, in other cases, it is possible that much of the information that can be shared with IPO investors may be "soft" rather than "hard,"¹⁰⁹ making it possibly difficult for the investor-plaintiffs to prove their case in court. When IPO investors receive communication from the firm that it plans to commit for the "long-term," to stay "innovative," and to take advantage of all "lucrative" opportunities in a certain industry, there may be much uncertainty surrounding what information is being disclosed and whether any misrepresentation has been made. Furthermore, even with "hard" information, it may also be difficult for the investor-plaintiffs to demonstrate that an important omission has been made by the firm.

The third is the cost and errors in the adjudication system. With respect to the cost of adjudication, when the investor-plaintiffs need to compensate their attorneys, likely on a contingency, this will reduce the net recovery for the investor-plaintiffs, which, in turn, will reduce their willingness to pay for the IPO shares.¹¹⁰ Furthermore, especially when the lawsuits are brought on a class action basis, without active monitoring, the plaintiffs will likely have to bear the agency cost. In some cases, when the cost of litigation, including the agency cost, is

¹⁰⁷ See Spamann (2022) (comparing primary and secondary market efficiencies). See also Bebchuk, Cohen, and Wang, Learning and the Disappearing Association between Governance and Returns, 108 *Journal of Financial Economics* 323 (2013) (documenting how the correlation between governance indices and abnormal returns documented in 1990s has subsequently disappeared and arguing that this is due to the market's learning the difference between good and bad governance structures). But see Edwards and Hanley (2010) (short selling at IPOs) and Ritter and Welch (2002) (documenting long-term under-performance of IPO stock compared to market indices).

¹⁰⁸ See Ritter and Welch (2002) (discussing under-performance of stock after its IPO).

¹⁰⁹ What we mean here by "hard" versus "soft" is the level of difficulty in verification, which can entail both the (out-of-pocket) cost of verification (such as cost of dispute resolution) and potential errors (type I and type II). See Albert H. Choi and George Triantis, Completing Contracts in the Shadow of Costly Verification, 37 *Journal of Legal Studies* 503 (2008) for more detailed analysis.

¹¹⁰ Cost of lawsuit is not always bad. If the firm needs to bear the cost of adjudication, this can increase the magnitude of deterrence. Another possibility is that, if, in equilibrium, there is no deterrence against the low-type firm (as in our example when the firm is raising \$60 from the outside investors), litigation cost can produce additional deadweight loss without achieving any deterrence benefit. When the cost is sufficiently high, by making the lawsuit not worthwhile ex post, we can reduce that inefficiency. See Choi and Spier (2022) for a more detailed analysis.

sufficiently high, it may be likely that the private lawsuit itself becomes not worthwhile pursuing. Similarly, to the extent that the adjudication is not perfect and the court may make false positive and false negative errors, such errors will also lower deterrence.

IV. Implications

While the main numerical example (Part II) and various extensions we have presented (Part III) are straightforward, they render a number of positive and normative implications. We will divide this section into two subsections: the first subsection discusses some positive implications (with some empirical predictions), while the second focuses on the normative side. Briefly, on the positive side, the numerical examples can help us better understand the tension between the theory and the prior empirical findings and also how we may expect certain variables to be more indicative or be correlated with the presence of market inefficiency (suboptimal governance structure for some firms). On the normative side, we examine various policy proposals, including prohibiting companies from adopting certain governance arrangements at the IPO or allowing (or requiring) shareholders to revisit the governance arrangement after the IPO (known as the “sunset” provision).

A. Positive Implications

Foremost, as the baseline numerical example shows (Tables 1, 4, and 6, in particular), whether the IPO market will function well in valuing governance provisions depends on two important assumptions: firms can have different governance provisions as their optimal provisions and investors may lack sufficient knowledge to see which provision is optimal for which firm. The latter may be particularly likely since the investors may not really know the true characteristics of the firm, e.g., whether the founder is more likely to commit for the “long-term” to maximize the firm value or, in the opposite, likely to extract substantial private benefits to the detriment of the outside investors.¹¹¹ The IPO market is susceptible for possible informational failure. All IPO companies, at least facially, claim that they want to maximize firm value and protect shareholders’ long-term interest. Relying on their statements (about future prospects) alone would be insufficient. In the presence of such informational problems, it is possible to observe, in equilibrium, that all firms (or a large majority of them) adopt the same governance structure even though this is not optimal.¹¹²

On the other hand, the fact that there is little variation in the governance structure, per se, does not imply that the equilibrium is inefficient. As we saw in the baseline numerical example (Tables 3 and 7), even with informational asymmetry, when certain governance feature is optimal across the board (although how valuable they are is uncertain with respect to any given firm), the IPO market will function relatively well so as to incentivize the firms to adopt the optimal governance structure. The uniform adoption can stem from two different reasons: (1) one governance feature is optimal across the board (with or without investors’ lacking information about firm type); and (2) firms’ adopting one governance feature due to the failure of the IPO

¹¹¹ See Choi (2018) (discussing Google founders’ letter to the investor).

¹¹² As briefly mentioned in Part I, this will also be true even when some firms do not know what the optimal governance structure for them is (the “uninformed” type). For the uninformed types, they would be concerned of sending a negative signal to the market (and being penalized on valuation) and in a pooling equilibrium, they will also choose the same governance structure that the informed types adopt. In some sense, this creates a “herding” behavior.

market. If we were to apply this finding to the earlier empirical literature on staggered boards (and other antitakeover provisions at IPOs), for instance, if having a staggered board is generally better for each firm, though there is a variation on how beneficial they are for each firm, the firms are likely to adopt them at the IPO, notwithstanding variation on valuation.

Conversely, even if we were to observe variations across firms (as with respect to dual class stock, for instance), this does not mean that the IPO market is functioning well. For our story, an important assumption is that, apart from the governance structure, other visible characteristics of the firms were more or less identical from the perspective of the investors. That is, both the high-type and the low-type firms were operating in the same industry, with same or similar business plans, with similar financial attributes (including cash flows and earnings), and so on. Hence, what is more important is whether there is variation across governance features after controlling for various, visible firm characteristics. Even when two firms look fairly identical (on all the visible characteristics), if one firm is being managed by a founder-controller whose interest is in committing for the long-term whereas the other is being managed by a founder-controller who has his sight more on pursuing pet projects and so on, such differences in goals may be very difficult to uncover.

Various extensions discussed in Part III also tell us a bit about the circumstances under which we may think that the IPO market is working well with respect to a firm's choice over governance. When, for instance, the firm relies less on external financing and more on internal capital markets, we can expect that the firms would be more inclined to adopt the optimal governance regime. One observable characteristic might be how much inside capital is being committed and, relatively, what fraction of the firm's equity is being offered to the public. As the amount of inside capital commitment rises and the fraction of equity sold to the public falls, we can be more confident that the IPO market may be functioning well. Another mechanism was underpricing. Somewhat paradoxically, the size of the underpricing can correlate with a better functioning IPO market, at least with respect to governance arrangements. Perhaps this can explain why, for instance, certain dual-class firms can outperform others in the short run. The third possibility was the disclosure of more easily verifiable information and the potential post-IPO liability.

Although these mechanisms seem disparate, there is a common driver that affects the efficacy of each mechanism: the size of the "skin in the game" that the founder-controller (and other pre-IPO shareholders) retain after the IPO. A heavier reliance on internal capital markets (and tantamount reduction on external financing) will increase the cash flow fraction retained by the insiders. When a firm deliberately underprices its IPO shares, though this will increase the outside investors' ownership fraction (since the firm needs to sell more shares to raise the necessary capital), the reason why this worked as a separating mechanism was the founder-controller's personal investment. That is, a larger personal investment combined with IPO pricing functioned as an efficiency-increasing mechanism. Finally, with respect to post-IPO liability, as we saw earlier, as the outside investors' ownership fraction rises, it becomes less likely that the investors would want to bring suit against the firm even with a valid claim. Conversely, as the founder-controller retains a larger fraction (with the outside investors with less), the post-IPO liability system can function better in inducing the IPO market to function better.

B. Normative Implications

On the normative side, one (fairly straightforward) implication is that imposing one type of governance structure across firms (or, conversely, banning certain feature) at IPO would not be optimal, particularly if we think that there is a lot of heterogeneity in optimal governance structure across companies. This goes to the debate over dual class stock. While some (including the CII's earlier proposal) recommend that we should ban dual class structure even at the IPO (just as do in mid-stream recapitalization through exchange regulations), such a one-size-fits-all policy is unlikely to produce an efficient equilibrium, especially when different firms have different set of optimal governance arrangements

1. Mandatory Sunset

Rather than imposing a mandatory set of governance features at the IPO, what if we were to require (or allow) the outside investors to revisit this issue after the IPO? What if, for instance, the outside investors are given the right over whether to keep the dual class structure sometime after the IPO? Some have argued for such a mandatory "sunset" provision, under which the firm that went to the public with a dual class structure can do so only for a pre-set number of years.¹¹³ Presumably, one of the reasons why the IPO market is prone to suffer the problems of adverse selection is that the outside investors lack requisite information to decide which governance provisions are optimal. After some time has passed, though, it may become likely that the information problems have been (substantially) mitigated. Perhaps then, the outside investors should be given the right to readjust so as to eliminate an inefficient governance regime and implement a better governance structure.

From the numerical example, suppose we are in a pooling equilibrium where both the high-type and the low-type firms adopt dual class structure at the IPO, even though the dual class structure is value-enhancing only for the high-type firm (Table 4). Now, even though the investors might have been unaware of whether they are purchasing from the low-type, it is plausible that, over time, they get to discover that the founder-controller who sold the stock is more interested in extracting private benefits rather than committing for the long-term or implementing her vision. Or perhaps over time, the investors get to observe the firm's performance and to test whether the firm's initial "commitment" to the long-term is turning out to be correct: the firm's type gets revealed over time. Once the type has been "revealed," giving the investors a chance to revisit the governance structure can improve welfare. For instance, suppose, initially, that we are in an inefficient pooling equilibrium (Table 4), but the investors discover that the firm is low-type. By switching from dual-class to single-class, they can increase the valuation from \$60 to \$70, and given their ownership of 50% of the firm's outstanding stock, the value of their ownership will increase from \$30 to \$35.

¹¹³ See Bebchuk and Kastiel (2017) at 619 (discussing possible fixed-time sunset). The Council of Institutional Investors have argued for a seven year sunset. See Introduction and note 13 *supra*. See also Fisch and Davidoff Solomon (2019) (arguing against time-based sunsets and in favor of more private ordering solutions).

At the same time, a mandatory sunset provision also presents a few complications.¹¹⁴ First, somewhat paradoxically, allowing the outside investors to “undo” a previous, inefficient governance structure (relatively quickly after the IPO) can potentially exacerbate the inefficiency at the IPO: an increase in ex post efficiency can come at the expense of reducing ex ante efficiency. Suppose we are in the example represented by the valuation numbers in Table 1. Suppose again that the high-type firm is offering to sell at \$100 valuation (with dual-class stock) and let’s examine the low-type firm’s incentive to mimic. Suppose that after the low-type firm mimics and sells at valuation \$100 (with dual class stock), the investors will switch from dual-class to single-class stock, thereby increasing the post-IPO valuation from \$60 to \$70. From the founder’s perspective, as before, by initially selling the stock with single-class at valuation \$70, she realized a return of \$20 ($= (28.6\%) \times (\$70)$). If the low-type founder were to mimic and sell 50% of its stock (with dual class) at valuation \$100, assuming that the class structure will be changed to single-class (shortly) after the IPO under a sunset provision, the founder’s return becomes \$35 ($= (50\%) \times (\$70)$), which is even higher than what the founder could have realized without a sunset ($\$30 = (50\%) \times (\$60)$).¹¹⁵ In the example, allowing the investors to undo the initially inefficient governance mechanism can provide an extra return for the founder ex ante and dilute the founder’s incentive to choose the optimal governance regime at the IPO.¹¹⁶ From the welfare perspective, the proposal may be ambiguous. Although it may induce less separation among firms at the IPO, given that the firms are not “stuck” with inefficient governance arrangement, the ex post efficiency will be improved.

2. Optional Sunset

A related issue with respect to sunsets is whether to make it mandatory or optional, i.e., whether to leave it to up the IPO firm to have a sunset provision in its governing document, such as the charter, rather than mandating it by law.¹¹⁷ The private ordering or the contractarian

¹¹⁴ The discussion focuses more on the structural problems that relate to the IPO market. Another issue, which may be worth at least a brief mention, has to do with beneficial firm-specific investment and possible hold-up. If the founder-controller has built substantial, firm-specific human capital that increases the total cash flow for the firm, allowing the public investors to change the governance structure mid-stream can create a possible hold-up problem. Knowing that the founder-controller has built up substantial firm-specific human capital, public investors (potentially led by an opportunistic institutional investors) may be tempted to demand additional consideration in return to voting in favor of retaining the dual class structure. If that is the case, allowing the public investors to revisit the capital structure can undermine the controller’s incentive to invest in firm-specific human capital in the long run.

¹¹⁵ If the founder-controller were to enjoy some private benefits of control with dual-class structure, this can create some opposite incentive, however. Suppose the founder-controller of the low type firm gets \$5 of private benefits of control with dual class structure (but none with single class structure). Without a mandatory sunset, the founder-controller’s return, by mimicking the high type, is \$35 ($= (0.5) \times (\$60) + \5). With a mandatory sunset, the return is also \$35 ($= (0.5) \times (\$70)$). With \$5 (or larger) of private benefits, a mandatory sunset provision doesn’t change the founder-controller’s incentive to mimic the high type at IPO. If the private benefits are lower than \$5, the mandatory sunset provision will boost the low type’s incentive to mimic the high type.

¹¹⁶ The pooling equilibrium will also change. When the investors know that they will be able to change the low-type firm’s inefficient governance structure ex post and realize a firm valuation of \$70 ex post, in a pooling equilibrium, the investors will be willing to value the firm at \$85 ex ante and demand 58.8% of the equity.

¹¹⁷ See Fisch and Davidoff Solomon (2019) (advocating for more “private ordering” solutions rather than mandating sunsets across all dual-class firms and also for event-based, rather than time-based, sunsets). The issue is similar to the debate over whether to allow firms to have an individual mandatory arbitration provision (with respect to federal securities claims) in their governing document. See Scott and Silverman (2013) (arguing for allowing the firms to adopt mandatory individual arbitration in their organizational documents) and Choi and Spier (2022) (demonstrating

approach, in principle, seems more attractive than a mandatory regulation since it allows the firms to innovate and also move away from one-size-fits-all approach. At the same time, though, private ordering solution is not without problems when we are dealing with potential market failure.¹¹⁸ When the provision is optional, given the informational issues in the IPO market, it is possible that neither type firm adopts a sunset provision even though it may be efficient. In the numerical example, although the low-type firm prefers to have a sunset, because the high-type firm does not (or is indifferent), the low-type firm would be concerned of sending a negative signal through adoption of a sunset provision. The low-type firm will mimic the high-type firm with respect to a sunset provision, too. The adoption of a sunset provision can provide another signal to the market and the low-type would want to prevent the market from making an adverse inference. In equilibrium, it is possible to have both firms not adopting a sunset provision at their IPOs.¹¹⁹

The second issue has to do with the possibility that the choice made at the IPO can create a “lock-in” effect and the parties’ incentive to revisit the governance structure after the IPO. Especially for the founder-controller, her incentive to adopt (or propose to change to) the optimal governance structure after the IPO can change significantly. To see this, let us slightly vary the initial numerical example by assuming some private benefits of control. Suppose, for the low type firm, with dual-class structure, the founder-controller gets to exercise \$5 of private benefits of control, while with the single-class structure, there are no private benefits. As we saw earlier, if the IPO market is functioning well without any informational issues, the founder-controller will still choose the single-class structure and realize a return of \$20. By contrast, suppose in the initial equilibrium, due to the informational issues both types adopted dual-class structure and the low type sold 62.5% of its stock at average valuation of \$80 (Table 4). Suppose also that the firm has an option to switch to single-class structure after the IPO and relying on the relative efficiency of the secondary market, the firm valuation converges to \$60. It is easy to see that the founder-controller would no longer be interested in switching to the optimal governance structure. By staying with dual-class, with \$5 of private benefits of control, the founder-controller gets a return of \$27.5 ($= \$5 + (0.375) \times (\$60)$). By switching to single-class structure, by contrast, the founder-controller’s return decreases to about \$26.3 ($\approx (0.375) \times (\$70)$). The initial suboptimal governance structure has made it quite difficult (if not impossible) to do a mid-stream correction.¹²⁰

how firms can pool by not offering either liability or class action waiver even though it may be efficient). See also Aghion and Hermalin (1990) (potential for inefficient “over-signaling” when agents are given contractual freedom).

¹¹⁸ Private ordering approach can be a bigger cause for concern when we are dealing with mid-stream (post-IPO) changes, particularly when either party (managers and directors on one hand and outside shareholders on the other) has discretion. See, e.g., Albert H. Choi and Geeyoung Min, *Contractarian Theory and Unilateral Bylaw Amendments*, 104 *Iowa Law Review* 1 (2018) (discussing the potential agency problems associated with midstream unilateral bylaw changes).

¹¹⁹ For instance, from the numerical example (Table 1), if the high-type firm were to adopt a sunset provision and sell its stock at \$100 valuation (with dual-class stock), the low-type firm would want to mimic that as well. In equilibrium, either both types or neither type will adopt a sunset provision. As the paper analyzed in Part III, for the private ordering approach to work and to reduce inefficiency, it has to impose differential costs on firms.

¹²⁰ Given that switching from a dual-class to a single-class structure requires a charter amendment and that an amendment proposal must be made by the board of directors, when a founder-controller has control over the board, it may be quite difficult to incentivize the directors to make the necessary proposal. See, e.g., DGCL §242. One way of getting around this resistance might be to make the conversion “automatic” based on some type of event-trigger, such as when the founder-controller’s ownership share falls below a threshold. See Aggarwal, Eldar, Hochberg, and Litov (2022) for different types of sunset provisions.

The third issue has to do with the functioning of the secondary market and the reliance on different financial metrics to determine whether a switch in governance structure (e.g., from dual to single-class structure) would be desirable. In short, is the secondary market (for IPO shares) more efficient than the primary market? Although we have (somewhat implicitly) assumed that the IPO market is more likely to perform poorly compared to the secondary market, that assumption may not always be true. For firms in certain industries, for instance, the IPO market may be working relatively well (either due to lack of information asymmetry or due to private ordering mechanisms) which the secondary market may be more prone to mispricing.¹²¹ Imagine that we are in a world represented by the valuation numbers in Table 3 but the numbers between dual and single class structure are switched so that it is optimal for both high and low-type firm to adopt a dual-class structure. In that case, notwithstanding the investors' lack of information, the IPO market would work well (enough) so that both types will adopt a dual class structure at (average) firm valuation of \$85. But if the secondary financial market doesn't work as well (due, for instance, to very noisy accounting metrics), so that a firm's valuation can diverge from its fundamental (at least temporarily), switching from dual to single class can introduce further (long-term) loss in value.¹²²

Fourth, given the possibility of inefficient governance structure at the IPO, if switching from one type of governance to the other should be possible post-IPO, one can argue that going in the reverse direction should also be allowed. That is, the outside investors perhaps are given a chance to switch from a single class structure to a dual class structure after the IPO, especially if we think that the initial IPO equilibrium is pushing all firms to adopt single class structure even though this may be inefficient for some firms. This is the scenario represented in Tables 5 and 6, where both types are adopting single class structure even though this is suboptimal for the high-type.¹²³ In fact, the current stock exchange regulations do not allow a mid-stream re-capitalization. This is in contrast to other governance mechanisms, such as staggered board, which can be adopted or changed mid-stream so long as shareholders vote in favor.¹²⁴ If we are going to ask the investors on whether they would want to retain a dual class structure or switch to a single class structure, we also need to think about whether we will allow the firms to switch from a single class structure to a dual class structure.¹²⁵

¹²¹ Long-run "under-performance" of IPO stock has been fairly well documented empirically. See Welch and Ritter (2022) at 1817—1822 (documenting that investment in value-weighted market portfolio generates an average return that is twice as high as an equal-weighted portfolio of IPOs over a three year horizon).

¹²² Here, we are implicitly assuming that the type has not been fully revealed post IPO and the post-IPO stock price is noisy and that the investors may not be aware of which governance provisions are good (whether they are in Table 1 or Table 2). In such a case, when the valuation drops to \$70, the investors will not be entirely certain that the firm type is low and, in case the firm type is low, switching to a single class structure will make them even worse off in the long-run.

¹²³ With respect to going in the "reverse" direction, the closest example might be when Google proposed to amend its charter so as to create a new non-voting Class C stock for the (implicit) purpose of allowing the founders (Sergey Brin, Larry Page, and Eric Schmidt) to maintain their control going forward. While there was litigation, the shareholders ultimately approved the amendment proposal. Facebook also proposed to create a new non-voting stock but that proposal was dropped. See Geeyoung Min, *Governance by Dividends*, 107 *Iowa Law Review* 117 (2021).

¹²⁴ See, e.g., DGCL §141(d) (requiring a shareholder approval to stagger a board).

¹²⁵ One issue of switching from single to dual class stock mid-stream has to do with information revelation. After the high-type firm has adopted single class stock at the IPO, because it is no longer getting the benefit of having a dual

Concluding Remarks

With the help of a simple, game-theoretic model, this paper examines the long-standing debate over whether firms have a market-based incentive to adopt optimal governance provisions at their IPOs. The paper has attempted to bridge the gap between the argument that the firms have a good incentive to offer its stock to the outside investors with optimal governance structure at its IPO and various empirical findings that have produced robust evidence that many governance features at the IPO seem inefficient. The paper's first argument has been that when different firms have different sets of optimal governance features and the outside IPO investors suffer from lack of information (that the founder-controller and other pre-IPO shareholders have), it becomes likely that the IPO market won't function efficiently to provide the requisite incentive. The paper's second thesis is to show how various private ordering mechanisms and the mandatory legal regime can mitigate that inefficiency. Building on the analysis, the paper has also explored various positive and normative implications, such as empirical predictions as to when we may expect to observe better pricing of governance regimes and the proposal over (mandatory or optional) sunset provision on dual class structure.

The paper's closer examination of the IPO market and firm's incentive over governance provisions also points to several steps for future research. Foremost, a firm's incentive over governance regime may be closely related to its preference over different types of financing, and the issue can be more broadly addressed through the existing corporate finance and governance literature. For instance, while the paper has analyzed the question over governance choice conditional on a firm's going public, it is not clear that a firm would choose to go public in the first place or, even if it does, rely (primarily) on equity financing. In part III, the paper has taken a first step by looking more closely at the reliance on internal markets. Broader questions over whether a firm will stay private (and rely more on private capital markets) or rely more on other types of financing (not just the internal capital markets) and how they relate to governance choices can be fruitful to explore.

Another is the interaction between founder-controller's private benefits of control and the firm's governance choice. In our analysis, even if the private benefits of control are non-existent, founders (and other pre-IPO shareholders) may still have an incentive to adopt suboptimal governance arrangement so as to take advantage of high valuation and being able to retain a larger fraction of cash-flow ownership. One issue that is worth further examination is how these two forces interact with each other. In our analysis, low-type firm would want to mimic the high-type and attempt to retain a larger fraction of the firm. Even though this is inefficient, when the founder-controller retains a larger fraction of the firm, this can actually mitigate the private benefits of control issue. As we saw briefly in the last section, founder-controller's private benefits of control can play an important role especially if the firm tries to implement a post-IPO, "midstream" governance change, for instance, by switching from dual-class to single-class structure. While the paper's focus has been on a firm's governance choice at its IPO, more research on the challenges of post-IPO governance changes will allow us to get a much better understanding of firm's overall governance and its dynamics.

class structure, perhaps it is less likely for the high-type firm to prove to the market that it can benefit more with a dual class structure.