NHH

Norwegian School of Economics
Bergen, Autumn 2023

Should Every Vote Count?

Examining the Influence of Dual-Class Equity on Firm Valuation in Sweden

Edvard Hjetland Nielsen and Kristian Wahl

Supervisor: Uwe Walz

Master thesis, Economics and Business Administration

Major: Financial Economics

NORWEGIAN SCHOOL OF ECONOMICS

This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Please note that neither the institution nor the examiners are responsible – through the approval of this thesis – for the theories and methods used, or results and conclusions drawn in this work.

Acknowledgements

This thesis is written as a part of our master's degree in Economics and Business Administration with specialization in Financial Economics at the Norwegian School of Economics during the fall of 2023.

We would like to thank our family and friends for all their support throughout our entire degree. Additionally, we are grateful to our fellow students at NHH for all the great discussions, lectures, and memorable moments we have shared in Bergen.

Lastly, we would like to thank our supervisor, Uwe Walz, for his excellent advice on the choice of topic, guidance, and feedback during the process of writing our thesis.

Norwegian School of Economics

Bergen, December 2023

Edvard Hjetland Nielsen

Kristian Wahl

Abstract

In the ongoing debate on dual-class equity, Sweden sets itself apart as a country where dual-class equity has been legal and prevalent for over a century. Dual-class equity has historically been associated with agency costs, harming firm value. We hypothesize that within the Swedish context of strong governance norms and minority protection, agency costs are considerably mitigated, materializing in a valuation premium for dual-class firms. Over time, we also expect this valuation gap to narrow as benefits recede and agency costs rise. By examining 305 Swedish firms that went public between 2010 and 2019, we find an initial valuation premium for dual-class firms compared to single-class firms, which decreases over time. We account for the endogenous decision of a dual-class listing through a three-stage instrumental variables estimation and estimate the time-varying effect using first-difference regression. These findings imply that within the appropriate context, the advantages of dual-class equity can outweigh the costs, and these factors dynamically converge as firms mature.

Keywords – Dual-class Share Structure, Ownership Structure, Corporate Governance, Firm Valuation, Initial Public Offering, Agency Costs

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1 Introduction

The principle of 'one share, one vote' has long been the cornerstone of corporate governance (Ghezzi et al., 2022). Particularly in public markets, there has been an implicit principle of *capital democracy*, where shareholders holding equal claims to equity also have equal opportunities to influence and control their investment. Recently, these principles have been challenged by a growing trend of firms choosing to go public with governance structures violating their premise. Specifically, there has been an increase in firms choosing to list on public exchanges with multiple share classes offering different voting rights, commonly referred to as *dual-class equity* (Aggarwal et al., 2022; Ritter, 2023).

Dual-class equity enables founders to maintain control even as they expand their capital through public markets, a strategy adopted by some of the most successful high-tech startups of recent decades, like Google, Facebook, and Snapchat (Hossain & Kryzanowski, 2019). This trend coincides with a general decline in public listings and a rise in the private capital funding available for late-stage startups. In response, public markets are increasingly intensifying their efforts to attract IPOs (Aggarwal et al., 2022), with major exchanges liberalizing their regulations on dual-class listings. Heavyweights in Asia, like Singapore's SGX and Hong Kong's HKEX, embraced dual-class listings in 2018, shortly followed by Shenzhen's SZSE and Shanghai's STAR Market. In 2021, the London Stock Exchange softened its stance to allow dual-class listings, while in the U.S., global giants Nasdaq and NYSE face pressure from the Council of Institutional Investors to implement time-based sunset clauses for dual-class IPOs. These developments have sparked considerable debate, with professor John C. Coffee (2018) of Columbia Law School describing the issue as "the most important issue in corporate governance today".

Motivated by the recent debate and events, our thesis is dedicated to investigating the effect of dual-class equity on firm value in Sweden. The notion that dual-class structures damage firm value is put forward by Lidman and Skog (2022), who emphasizes that this argument effectively encompasses all criticisms against this structure. Furthermore, dual-class firms represent almost three-quarters of Sweden's market capitalization (Mile, 2023), and is a longstanding fundamental characteristic of the Swedish equity market. Combined, this makes studying the effects on firm value in Sweden a relevant and intriguing context.

We investigate valuation differences in a sample of 305 Swedish firms that went public from 2010 to 2019, examining whether there exists a significant valuation difference between dual-class and single-class firms following their IPOs. We measure effects on valuation by using two transformations of a proxy for Tobin's Q, notably the natural logarithm and the inverse, to correct for measurement error. To account for the endogenous decision to opt for dual-class equity at IPO, we apply a three-stage instrumental variable regression using hypothesized determinants of dual-class listing as instruments. We also conduct a first-difference estimation to investigate the effects of dual-class equity over time.

We find that, after correcting for endogeneity, firms that go public with dual-class equity structures are valued at a premium compared to firms with single-class equity. This valuation premium persists for five years following the IPO but is only statistically significant in the first three years. We also find that as time passes since the IPO, the relative valuation premium between duals and singles decreases. Through the lens of balancing benefits against costs, our findings imply that initially the costs of dual-class equity are outweighed by the benefits. However, as the premium diminishes over time, this implies that the gap between costs and benefits decreases over time.

This thesis contributes to the existing literature by providing evidence from the Swedish market. Our results align with recent findings of higher post-IPO valuations (Cremers et al., 2018; Kim & Michaely, 2019), in contrast with earlier research indicating valuation discount for duals (Gompers et al., 2010; Masulis et al., 2009; Smart et al., 2008). Within Swedish borders, our results align with studies suggesting that Sweden's regulatory framework may mitigate the agency costs related to dual-class structures (Bergström & Rydqvist, 1990; Holmen & Knopf, 2004). Hence, our findings contribute to the growing evidence advocating for a more nuanced view of dual-class equity.

This thesis is structured as follows: Section 2 presents the theoretical foundation, existing literature, and our hypotheses. Section 3 explains our sample selection and data collection process, as well as the descriptive statistics for our data set. Section 4 presents an in-depth review of our methodology and the rationale behind our empirical approach. Our final results are presented in Section 5 before the implications and limitations of our findings are discussed in Section 6. Finally, Section 7 presents our overall conclusions.

2 Background

This section presents the theoretical framework and existing empirical literature that serve as the foundation for our hypotheses. Initially, we delve into the concept of dual-class share structures, exploring the rationale behind their adoption and application. Subsequently, we shift our focus to initial public offerings (IPO), presenting the motivations and costs associated with going public. We then review the combination of these two concepts in the notion of dual-class IPOs. Here we investigate the agency theory-driven drawbacks, as well as the merits of preserving control. Moving forward, we provide context to dual-class structures within the Swedish market, offering insights into the perceptions of dual-class firms in Sweden. Lastly, we review the existing literature on dual-class structures' effect on firm valuation, culminating in the formulation of the hypotheses for this thesis.

2.1 Dual-class Share Structure

A *dual-class share structure* is a separative structure of share capital where a company issues multiple classes of shares (Hossain & Kryzanowski, 2019). The different classes of stock are assigned separate rights and restrictions, primarily in terms of voting and cash flow rights. Although the broad concept of dual-class stock also entails shares with distinct cash flow rights, such as superior dividend claims, it is most commonly associated with firms that have shares with differentiated voting rights. Typically, the shares are divided into two classes, with one class having superior voting rights, effectively creating a wedge between economic and controlling rights (Aggarwal et al., 2022; Lidman & Skog, 2022). The superior class is often privately held by a person or group that, while representing a minority of the total shares, controls the majority of the voting rights. The subordinate voting class is usually the one available for public trading (Hossain & Kryzanowski, 2019). Dual-class share structures are popular among founders, and other insiders, of emerging companies as they allow them to preserve control when raising capital from outsiders, without the need to make the proportional investment (Condon, 2018). Adopting the structure can thus be particularly advantageous, and even decisive when considering taking the firm public.

2.2 Initial Public Offerings

An *initial public offering* (IPO) is the process where a private company becomes publicly traded by offering its shares to the public for the first time (Berk & DeMarzo, 2020, p. 872). Going public involves becoming available for public trading through listing on a regulated stock exchange. Firms can go public by either issuing new shares or selling existing shares. Usually, firms opt for a combination, allowing insiders to cash out, by selling a fraction of existing shares, while simultaneously raising capital by issuing new shares (Brau, 2012).

The motivation for going public is commonly attributed to raising capital and creating liquidity for new and existing shareholders (Berk & DeMarzo, 2020, p. 872). Additionally, access to public capital markets positions the firm for future capital expansions. Support for this motivation could be found in the early academic literature of Modigliani and Miller (1963) and Scott Jr (1976) who argue that firms choose to go public when this represents the source of financing with the lowest cost of capital. An IPO could also be motivated by founders and early investors wishing to divest and profit on their investment, particularly for venture capital investors, as an IPO represents an attractive exit strategy (Aggarwal et al., 2022; Zingales, 1995). In a survey of 336 US CFOs conducted by Brau and Fawcett (2006) CFOs emphasized that IPOs also represented a strategic move to build reputation and increase publicity, a view especially prominent among high-tech firms.

There are also several costs associated with going public. There are large direct costs related to the listing process, such as underwriting, legal, and listing fees (Berk & DeMarzo, 2020, p. 884). There are also substantial indirect costs, including underpricing, alternative costs, and investment costs due to enhanced compliance regulations. Another indirect cost is the cost of potentially losing control of the company, which is an important focal point of this study. While companies have incentives to choose an optimal governance structure at the IPO (Gurrea-Martínez, 2021), the importance of retaining control might make up an indirect cost, as founders potentially prioritize maximizing control benefits rather than expected shareholder value. The CFO survey by Brau and Fawcett (2006) also revealed that the primary benefit of remaining a private company was to preserve ownership and decision-making control. A practical solution to this indirect cost is to increase the wedge between ownership and control by going public through a *dual-class listing*.

2.3 Costs and Benefits of Dual-class Listings

We will refer to the process of undertaking an IPO with two or more share classes with differentiated voting rights as a dual-class listing (DCL). Our classification is irrespective of whether the firm had pre-existing dual-class stock or if the shares with differentiated voting rights were issued specially for the IPO. For example, it is not uncommon for companies to convert their shares with superior voting rights into common stock upon listing. Hence, we base our premise on the understanding that the choice of equity structure represents a strategic decision that firms must deliberately consider before going public. While a DCL provides a valuable mechanism for insiders to retain control post-IPO, it also carries less prominent implications for firm value. Aggarwal et al. (2022) draws attention to this aspect, noting that the increase of DCLs in the last decade is puzzling from a governance perspective due to the associated agency costs.

2.3.1 Agency Costs of Separating Ownership from Control

Separation of ownership refers to the concept of the firm's owners (shareholders) being different from those who control and manage the firm's day-to-day operation (management and directors) (Berk & DeMarzo, 2020, p. 39). Although a common feature for large public companies, the separation between ownership and control has long been recognized as a source of agency problems in corporate governance (Florackis et al., 2009; Gurrea-Martínez, 2021; Masulis et al., 2009). These problems arise from the principal-agent problem theory, as described by Jensen and Meckling (2019). The principal-agent problem occurs when one party (the principal) delegates authority to another (the agent) with the responsibility to perform tasks on their behalf. In scenarios where both parties are driven by self-interest, conflicts may arise, resulting in the agent making decisions that do not serve the best interest of the principal. In the context of dual-class equity, this separation becomes more pronounced due to the agents' disproportionate control relative to their financial stake (Gurrea-Martínez, 2021). Hence, the misalignment of interest could be amplified, thereby increasing the risks of associated agency problems.

The costs that arise for the principal to mitigate the potential problem of sub-optimal decisions from the agent are known as *agency costs*. These actions are normally addressed by establishing appropriate incentives for the agent. However, as Jensen and Meckling

(2019) argues, it is generally impossible to ensure that the agent's decisions align perfectly with the interests of the principal without incurring any costs. These agency costs can be more directly measurable such as monitoring costs to oversee agent's action, including expenses for audits and performance reviews, and bonding costs, referring to contractual agreements ensuring agents' commitment to the principals' interests (Jensen & Meckling, 2019). Despite these measures, some divergence between the agent's actions and those that would maximize the welfare of the principal might still be present, incurring an indirect cost known as residual loss. Residual loss typically materializes in the form of missed opportunities. For instance, a CEO might decide to not pursue a potentially profitable risky investment if they believe it poses a risk to their job security, despite the potential for significant long-term returns (Jensen & Meckling, 2019).

In the context of dual-class structures, Lidman and Skog (2022) highlights two principal economic channels through which agency costs are perceived to damage company value. Firstly, dual-class share structures are expected to heighten agency costs, primarily due to the *extraction of private benefits of control* through both shirking and tunneling of company assets for personal gain. Secondly, dual-class structures insulate underperforming managers and undermine the market for corporate control, leading to *managerial entrenchment*.

Works by La Porta et al. (1999) and (Cronqvist & Nilsson, 2003) suggest that controlling shareholders with excess voting rights both have the interest and opportunity to expropriate minority shareholders. Furthermore, they emphasize that this tendency towards expropriation is seemingly only limited by legal constraints. Cronqvist and Nilsson (2003) further proposes that controlling shareholders often encounter a trade-off between enhancing firm value and extracting benefits for personal gain. They argue that when controlling shareholders have limited economic downside, but reap the full benefits from private extraction, the trade-off will favor the extraction of private benefits. This is amplified for dual-class firms, as the controlling minorities often hold higher voting rights relative to their economic stake, implying that they only internalize a fraction of their potential value-damaging actions. This situation exemplifies the concept of *moral hazard*. The occurrence of moral hazard can lead to various harmful outcomes. One such case is *shirking*, where shareholders or managers neglect their duties or engage in self-serving activities, at the cost of the outside owners (Junzheng, 2016). Moreover, moral hazard can give rise to *tunneling* practices, which involve transferring assets to entities under the controlling shareholders' control at below-market prices. Finally, public shareholders typically anticipate that an owner might extract private benefits of control unless there's a credible commitment to prevent such actions. This expectation can lead to an increase in the cost of equity capital, adversely affecting the firm's success and growth potential (Thomsen, 2016).

Furthermore, dual-class shares allow controlling insiders to entrench themselves, negatively affecting firm performance (Gompers et al., 2010). Firstly, controlling managers in dual-class firms often face a minimal risk of losing their jobs through the nature of their substantial voting stake. This type of entrenchment may result in agency costs to shareholders by allowing unfit managers to retain their positions and engage in self-serving practices like empire-building (Baulkaran, 2014). This includes cases where management is not giving their best effort because they face no consequences when underperforming, as well as instances where the managers are simply not competent. In other words, the distinct structure of dual-class firms can foster larger inefficiencies compared to single-class firms, where market mechanisms more effectively regulate and replace poorly performing management. Secondly, dual-class firms are to a large extent isolated from the market for corporate control. Baulkaran (2014), refers to dual-class share structures as the most effective anti-takeover mechanism, and argues that managerial entrenchment is particularly strong in dual-class firms, since the market for corporate control is virtually nonexistent.

2.3.2 Benefits of Retaining Control

Despite well-founded concerns rooted in the broad corporate governance theory, there are several arguments in support of dual-class share structures. The structure is often justified by founders and other early investors avoiding the fear of losing control, which could hold positive implications for firm value in several ways.

Firstly, Bebchuk and Kastiel (2017) advocates that allowing a talented founder to maintain control post-IPO can enhance firm value due to their superior leadership skills and vision. Goshen and Hamdani (2015) argues that founders 'idiosyncratic vision' could be empowered through a DCL as it relives founders from concerns about shareholder activists and the pressure of short-term market expectations (Goshen & Hamdani, 2015; Reddy, 2020).

Allowing a founder to freely implement their strategy and focus on long-term goals could put the firm in a better position to expand their businesses and create lasting benefits for the company (Gurrea-Martínez, 2021). In the words of Facebook founder Mark Zuckerburg himself "You don't have to worry about losing your job over a couple of bad quarters or controversial short-term decisions, and that makes it easier to make the decisions you think are correct (Priestley, 2015).

Secondly, a dual-class structure mitigates the downside of waiving a large stake in the company through an IPO. For companies with controlling owners who place a high value on control, applying a dual-class structure provides them with greater incentives to take their company public (Gurrea-Martínez, 2021). Given that firms go public to raise money when external capital is cheapest a DCL effectively allows companies that otherwise would stay private to expand their business at the lowest cost. Put simply, adopting a dual-class structure could increase these types of firm's value by accessing more cost-effective external capital.

Thirdly, if dual-class structures result in an increased number of IPOs this also holds several benefits for external investors and other stakeholders (Gurrea-Martínez, 2021). On one hand, investors are given the opportunity to invest in companies that otherwise would be private, allowing an increased number of investors to take part in profitable firms. Moreover, a DCL, like other public transactions, offers investors a regulated, transparent investment option, with the flexibility to divest if they are unsatisfied with their investment's performance. On the other hand, capital markets and their stakeholders also benefit from DCLs, as an increased number of IPOs bring along higher trading volume, liquidity, and information efficiency (Gurrea-Martínez, 2021).

2.3.3 The Levers of Dual-class Firm Value

Following Cremers et al. (2018), we conceptualize the effect of the costs and benefits of dual-class share structures on firm value as Equation 2.1:

$$Q_{Dual} = Q_{Single} + \Delta Q_{Agency} + \Delta Q_{LV} \tag{2.1}$$

Here, Q_{Dual} represents the relative valuation, measured by Tobin's Q, of a firm with a dual-class structure, while Q_{Single} denotes the relative valuation of a comparable firm with only a single class of shares. ΔQ_{Agency} reflects the agency costs related to mitigating the extraction of private benefits of control and managerial entrenchment. Conversely,ΔQ_{LV} signifies the unique value added by the dual-class firm's founder retaining control, attributed to their leadership and vision.

The costs and benefits, ΔQ_{LV} and ΔQ_{Agency}, can be thought of as *levers* that dynamically influence the valuation of dual-class firms. Based on our discussion above ΔQ_{LV} is likely to be positive, while ΔQ_{Agency} is negative. Hence, Equation 2.1 suggest that the market valuation of a dual-class firm could surpass that of a similar single-class firm when the condition outlined in Equation 2.2 is met.

$$|\Delta Q_{LV}| > |\Delta Q_{Agency}| \tag{2.2}$$

2.4 Dual-class Listings In a Swedish Context

Sweden is the largest Nordic economy and boasts a transparent market with few barriers to entry, a strong and well-performing capital market, and few corporate governance issues. According to Modular Finance AB, the Swedish public market consists of 1,017 companies at the time of writing, comprising a total market capitalization of 13.5 trillion SEK (Modular Finance AB, 2023). Moreover, the Swedish market is particularly strong in sectors such as technology, healthcare, and industrials. A European Commission (2020) report highlights that while most EU member states experience a decline in listed companies, Sweden contrasts this trend with nearly 400 net listings between 2010 and 2018. Sweden therefore stands out as one of the few Western countries with both growing market capitalization and number of listed companies in the past decade (Lidman & Skog, 2022).

While the popularity of DCLs is a more recent trend among several large equity markets worldwide, the Swedish market has a long-standing tradition of allowing dual-class structures, dating back over 100 years (Lidman & Skog, 2022). According to Lidman and Skog (2022), dual-class structures have been exceedingly common, and more or less the norm for publicly listed companies in Sweden. In the words of Confederation of Swedish Enterprise (2023): "Dual-class share structures with differentiated voting rights is an important and valuable feature of the Swedish stock market". The exact split between duals and singles has varied greatly, ranging from 40 to 87 percent of the listed companies on the Main Market of Nasdaq Stockholm the past seventy years (Lidman & Skog, 2022). Currently, dual-class companies represent up to three-quarters of the market capitalization of the Main Market, according to Financial Times (Mile, 2023). Unlike in the U.S., where dual-class equity is commonly associated with high-tech and media companies (Hodgson, 2023), dual-class structures are widespread across companies of all sizes and sectors in Sweden. The widespread adoption of dual-class structures in Sweden, contrasting with the U.S. and U.K., provides an intriguing context for investigating the effect of dual-class equity on firm valuation.

2.4.1 Regulations on Dual-class Equity in Sweden

At no point in time has there been any prohibition on dual-class equity for public companies in Sweden (Lidman & Skog, 2022). The only DCL-specific regulations in place are a maximum wedge of 10 to 1 between high and low voting shares, and a restriction on voting to change the articles of association. Any amendment to the articles of association necessitates a substantial majority approval, ranging from two-thirds to nine-tenths, and the majority is required both in terms of votes cast and the voting shares present at the general meeting (Lidman & Skog, 2022).

While direct restrictions on DCLs are minimal in Sweden (Gurrea-Martínez, 2021), the country's company law strongly emphasizes minority protection (Lidman & Skog, 2022). This indirect regulation of DCLs is characterized by several features: 1) strict hierarchy between the general meeting, board, and management, 2) a strong principle of equal treatment of shareholders, 3) high degree of transparency, 4) rigorous majority vote requirements, 5) strict rules for related-party transactions, and 6) tougher rules on delistings to ensure alignment of interest for all shareholders (Lidman & Skog, 2022). According to Thomsen (2016), the Nordic corporate governance model is built on supporting entrepreneurial ownership retention of control through dual-class equity. However, he emphasizes that Sweden's strict protection of minority shareholders serves to counterbalance and limit the potential for extraction of private benefits of control. Consequently, Thomsen (2016) claims that within this context of Swedish minority protection, a firm's cost of equity is not affected by the choice of adopting a dual-class structure.

2.4.2 Brief overview of Swedish Exchanges

A company considering going public in Sweden has four primary markets to consider: Nasdaq Stockholm, Nordic Growth Market, and Spotlight Stock Market. These exchanges cater to companies at different stages of development and offer different advantages, costs, and degrees of regulations. However, it is common for companies to transition between these exchanges as they evolve.

- **Nasdaq Stockholm (MM):** The main stock exchange in Sweden, also known as the Stockholm Stock Exchange (SSE). The primary equity market is the Nasdaq Stockholm Main Market, suited for the country's larger and more established companies with strict listing and reporting requirements.

- **Nasdaq First North Growth Market (FN):** The junior market of Nasdaq Stockholm. First North is an MTF suited for small to mid-sized companies, with less strict reporting and regulatory requirements than the Main Market.

- **Nordic Growth Market (NGM):** Tailored for small and medium-sized firms, offering a more accessible platform with less stringent listing and reporting requirements than the Nasdaq Main Market. Consists of the regulated equity market NGM Main Regulated, and an MTF called NGM Nordic MTF. When referring to NGM we refer to both these markets.

- **Spotlight Stock Market**: The smallest Swedish exchange, consisting of one MTF. As with NGM Nordic MTF, targets small and mid-sized companies, while also having more relaxed listing and reporting requirements than both NGM and Nasdaq.

2.5 Literature review

The existing literature on dual-class equity and firm valuation has a long history (Aggarwal et al., 2022; Smart et al., 2008). However, the research varies greatly in their approach, companies included, and time periods considered. The findings are also rather dispersed. Predominantly, the research has focused on U.S.-based firms, with notable studies by Gompers et al. (2010), Masulis et al. (2009), and Smart et al. (2008) documenting a lower mean valuation for dual-class firms compared to single-class firms. More recent studies by Cremers et al. (2018) and Kim and Michaely (2019) find conflicting evidence, as they report higher mean valuations for duals in the initial years after their IPO. Other studies focusing on non-U.S. markets show that the effect of dual-class equity on firm value might not be inherently detrimental (Dyck & Zingales, 2004; Ikäheimo et al., 2007; von der Crone & Plaksen, 2010). Bebchuk and Kastiel (2017) claims that the costs and benefits of DCLs vary throughout the corporate life cycle, while studies focused on the Swedish market by Bergström and Rydqvist (1990) and Holmen and Knopf (2004) indicates that Sweden's regulatory framework and institutional structures offset the potential drawbacks of weak corporate governance.

An influential study by Gompers et al. (2010) investigates the effect of separation between ownership and control for a comprehensive list of U.S. dual-class firms between 1995 and 2002. Through least squares regression, they find significant evidence that mean firm value, measured by Tobin's Q, increases with higher insider cash flow rights, and decreases with higher insider voting rights. Running an IV-regression using hypothesized determinants for the dual-class dummy variable as instruments, they report similar estimates but with lower significance. Analyzing a comparable sample, Masulis et al. (2009) observes similar effects. Their findings align with the agency-costs hypothesis, suggesting that agency costs rise as the wedge between owner-managers voting rights and cash flow rights increases. They further argue that this imbalance often leads to the destruction of firm value through managers extracting private personal benefits at the expense of other shareholders. Smart et al. (2008) also find a valuation discount related to DCLs, both at the time of the IPO and for the five subsequent years. The researchers attribute this discount to governance concerns, specifically managerial entrenchment, as they find no evidence of lower stock return or operating performance for duals compared to singles.

In contrast, more recent studies suggest that dual-class firms exhibit higher valuations around the time of the IPO. A study carried out by Cremers et al. (2018) examines U.S. dual-class firms from 1980-2019, and finds that dual-class firms exhibit higher Tobin's Q than single-class firms around the time of the IPO. Furthermore, they attribute the short-term valuation premium to the founders' unique vision and leadership skills. Kim and Michaely (2019) finds similar evidence of an initial higher Tobin's Q for duals. However, they also observe declining margins, innovation, and labor productivity compared to single-class firms as firms mature. Both studies suggest that the net economic benefits of dual-class structures change negatively over a firm's life-cycle, attributing this decline to increased agency costs over time due to a widening of the wedge between insider voting and cash flow rights (Cremers et al., 2018; Kim & Michaely, 2019).

Bebchuk and Kastiel (2017) also explores the evolution of dual-class structures over longer periods of time following the IPO. They find that while DCL can be efficient initially, the benefits related to the founders' idiosyncratic vision usually decrease as the company matures. Their study also reveals that controlling shareholders often maintain a dual-class structure even after it becomes inefficient, strengthening the misalignment between the interests of insiders and outsiders. Additionally, they argue that the benefits of insulating management from short-term market pressures, a common justification for DCLs, also diminish over time (Bebchuk & Kastiel, 2017). This study highlights the need for a dynamic approach to dual-class governance, including potential sunset clauses, which are provisions that automatically convert dual-class shares to a single-class structure after a certain period or event, to align the long-term interests of shareholders as the company evolves through its life-cycle.

Conducting a study within a Swiss context, with a high level of investor protection and emphasis on reliability and reputation, von der Crone and Plaksen (2010) suggests that the negative effects of DCLs might be mitigated in certain environments. Investigating 145 public firms between 1992 and 2008, they found a significant positive effect of dual-class structures on firm valuation after correcting for sample selection. They attribute their result to the improved corporate transparency requirements in Switzerland, as well as to the traditional popularity of the dual-class structure. Ikäheimo et al. (2007) use data for publicly listed Nordic companies over the period 1999–2004 to estimate the influence of anti-takeover provisions on valuation, stock return, and operating performances. They find that while dual-class firms initially faced a lower Tobin's Q compared to their single-class counterparts, this gap appears to diminish over time. This observation serves as a notable contrast to other literature, which often advocates for a more persistent, and increasing, discount for duals. In a study of 339 controlling block sales in 39 different countries, Dyck and Zingales (2004) discovered that the private benefits of control are inversely related to the development level of capital markets. In less developed capital markets, like Venezuela, ownership tends to be more concentrated, and private benefits of controls are substantially greater compared to more developed markets, such as the Nordics. They also analyze which institutions are important for mitigating private benefits, and find evidence that better accounting standards, better legal protection of minority shareholders, better law enforcement, a high level of diffusion of the press, and a high rate of tax compliance are associated with a lower level of private benefits of control (Dyck & Zingales, 2004).

Within Swedish borders, Holmen and Knopf (2004) investigates 121 merges involving dual-class firms between 1992 and 1995. They find that despite Sweden's high degree of separation between ownership and control, potentially facilitating the extraction of private benefits, instances of shareholder expropriation occur relatively infrequently. The authors attribute this to specific factors in Sweden, including robust extralegal institutions, tax compliance, and widespread newspaper circulation, all of which are consistent with enhanced shareholder protection. In other words, they posit that regulatory and cultural factors help offset the drawback of weak corporate governance structures Holmen and Knopf, 2004. Bergström and Rydqvist (1990) reported that among Swedish publicly traded dual-class firms, the largest shareholder coalition typically controls more than 50% of equity. However, they argue that this value of control is not driven by a "pure demand for power" or expropriation at the expense of shareholders. Rather, they show that controlling shareholders in Sweden held larger equity stakes than the minimum required by Swedish law, and invested significantly in subordinate voting shares, inconsistent with the expropriation hypothesis. In essence, Swedish data do not support the argument that dual-class structures are used for wealth expropriation by holding control with little equity, hence allowing for potential benefits of dual-class structures (Bergström & Rydqvist, 1990; Holmen & Knopf, 2004).

2.6 Hypotheses

To investigate the effect of dual-class share structures on firm value in Sweden, we construct two hypotheses by combining insights from the theoretical foundation, the Swedish context and the exiting literature.

The studies by Gompers et al. (2010), Masulis et al. (2009), and Smart et al. (2008) all find dual-class equity to be negatively associated with Tobin's Q, attributing the effect to high agency costs, equivalent to Q_{Agency} from Equation 2.1. The more recent studies by Cremers et al. (2018) and Kim and Michaely (2019) use an updated time period on a similar sample, and find that in the first six years post-IPO, duals are valuated at a premium compared to singles. They attribute the effect to Q_{LV} outweighing the costs. Given the similarities in methodology and samples of these studies, we are inclined to believe that markets have somewhat altered their perceptions of DCLs post-financial crisis. Following the argumentation of Cremers et al. (2018), we find it plausible that this reflects a growing recognition of the potential benefits of control retention, emphasizing market confidence in founder-led visions and long-term strategies, rather than a diminished impact of agency costs. Sweden is renowned for its robust corporate governance norms, legal institutions, and investor protection mechanisms, which, according to Dyck and Zingales (2004), are characteristics reducing the potential for extraction of private benefits. Moreover, findings by Bergström and Rydqvist (1990) and Holmen and Knopf (2004) further support the notion of lower agency costs within Swedish borders. Complementing these findings, von der Crone and Plaksen (2010) identifies a valuation premium for duals-class firms compared to single-class firms in Switzerland, a comparable market to Sweden.

Considering the estimation period of our analysis and the Swedish context, we anticipate that in the initial five years following an IPO, Q_{Duals} is higher than $Q_{Singles}$, implying that $|Q_{LV}| > |Q_{Agency}|$. Based on this, we present our first hypothesis as follows:

Hypothesis 1: *For the first 5 years after the IPO dual-class firms are valuated at a premium compared to single-class firms.*

Furthermore, both theoretical frameworks and empirical literature emphasize that the impact of dual-class structures on firm value is dynamic. Using our conceptualization from Equation 2.2, we can understand this as the relative relationship between the levers changing over time. Cremers et al. (2018) and Kim and Michaely (2019) both observe that the valuation premium initially found for duals relative to singles tends to diminish over time. They attribute this finding to ΔQ_{Agency} from Equation 2.2 potentially increasing due to a widening of the difference between insider voting and cash flow rights as firms mature. This is supported by the findings of Bebchuk and Kastiel (2017), who further suggest that the potential benefits of control retention tend to recede over time, in other words, that Q_{LV} decreases over time. Additionally, Gurrea-Martínez (2021) argues that the value of a founder's vision and leadership skills likely diminish over time, particularly as the initial vision becomes realized or the firm expands beyond a scale that aligns with the founder's management approach.

Aligned with the broad findings of exiting research, we anticipate that over time, the relative valuation of Q_{Duals} compared to $Q_{Singles}$ will decrease, implying a relative change in favor of $|\Delta Q_{Agency}|$ to $|\Delta Q_{LV}|$. This argumentation leads to the following hypothesis:

Hypothesis 2: *The relative valuation of dual-class firms compared to single-class firms decreases over time.*

3 Data

This thesis focuses on Swedish companies that conducted their IPOs between 2010 and 2019. We specifically distinguish between firms that went public with a dual-class or single-class structure. After evaluating all listings on Sweden's four major marketplaces, our final sample consists of 305 firms, with 59 dual- and 246 single-class firms. The first subchapter of this section describes the criteria used in our sample selection process and the second how and where we have collected the data for our analysis. Lastly, we present descriptive statistics and discuss the representativeness of our final sample.

3.1 Sample Selection

The first step in creating the sample for our analysis was to define the time period in which we wanted to investigate the effect of DCLs. We chose to start our time period in 2010 due to the unusual market conditions following the financial crisis in 2008, where the Swedish economy also experienced long-lasting effects. By initiating our sample in 2010, we minimize the impact of external factors from the financial crisis on our estimations. Furthermore, as highlighted in Section 1, the trend of an increasing number of firms opting for public listings with dual-class equity is predominantly a phenomenon of the last decade, at least globally. Investigating a time period that aligns with the recent debate ensures the relevance of our findings. We also stopped collecting data on new listings in 2019 to allow us to obtain three subsequent year-end observations even for the most recent IPO firms in our sample.

We collected data on all listings conducted on the four largest Swedish markets, namely Nasdaq Stockholm, Nasdaq First North, North Growth Equity, and Spotlight. The listing information was retrieved from each of the exchanges through Nasdaq Market Surveillance Reports, NGM's listing reports, Spotlights website, as well as Nyemissioner.se, a website operated by Exchange Forum Sweden. This resulted in an initial sample of 814 listings across the various exchanges.

This raw sample of 814 listings from the time period 2010-2019 for the four major Swedish marketplaces served as the outset for the creation of our final sample. However, many listings in this raw sample did not possess the desired characteristics to be included in our final data set. Therefore, to ensure a consistent and comparable analysis across the board, we established a set of criteria to be met for firms to be part of the final sample. Drawing from the insights of the previous literature discussed in section 2.5, and making adjustments to account for unique Swedish factors, we formulated the following four exclusion criteria:

1 **Exclusion of foreign companies:** To specifically focus on Swedish entities, our study excludes foreign companies due to the diverse regulatory and legal frameworks across countries. Although many non-Swedish firms in our sample are from Nordic countries, there could still be significant differences in the adoption of dual-class, as noted by Ikäheimo et al. (2007). For instance, duals are prevalent in Sweden, Finland, and Denmark, yet it is rare in Norway, likely due to legislative differences. Variations in corporate governance practices across countries further influence DCL perception. Thus, we exclude all firms without the Swedish identification code 'SE' in their ISIN. Additionally, we verified that the included firms were legally designated as 'Aktiebolag' (AB), the legal designation used for Swedish companies that are incorporated and have issued shares.

2 **Exclusion of non-traditional IPOs:** We exclude all firms that have been listed through other means than a traditional IPO. Companies that did not issue new equity or sold existing shares in relation to their IPO are excluded from or sample as they are not affected by the same market forces when choosing a governance structure in the IPO process. This exclusion encompasses direct listings, which bypass the typical share issuance or sale process, and alternative listing forms such as spin-offs, equity carve-outs, and reverse takeovers. We also exclude companies that are transferring to a new list, switching between lists, or conducting dual, secondary, or parallel listings, and firms that have previously been publicly listed but re-listed within our time frame. Additionally, listings involving preferred shares, which carry unique rights compared to common shares, and unit offers are also omitted.

3 **Exclusion of regulated industries:** Following previous literature, we exclude firms in regulated industries and in the banking and insurance industry (Cremers et al., 2018; Kim & Michaely, 2019; Smart et al., 2008). Specifically, our exclusion criteria omits firms from the financial sector, real estate investment trusts (REITs), and

utilities, which are subject to heightened regulation and unique governance structures in Sweden.

4 **Exclusion of firms with insufficient data availability:** We also exclude companies that lack comprehensive ownership and accounting data, or where the IPO-related prospectus/memorandum is not accessible. This criterion of exclusion is implemented post the data collection process detailed in section 3.2.

The exclusion process resulted in a final sample of 305 firms. The total sample and the number of excluded firms under each criterion are summarized in Table 3.1

Table 3.1: Sample Selection Process

Exclusion criteria	**Excluded**	**Net Firms**
Listings on Swedish exchanges 2010-2019		814
Foreign companies	68	746
Non-traditional IPO	322	424
Regulated industries	26	398
Insufficient data availability	93	305
Final sample		**305**

This table presents a detailed breakdown of our sample selection process, illustrating the number of firms excluded at each stage and the remaining net count of firms remaining in our sample after each exclusion step. The first three steps of exclusion were carried out prior to data collection, while the final step was conducted concurrently.

To ensure transparency and provide a clear reference, we have included a comprehensive list of all included firms in Appendix A.1. along with an indication of whether the firm went public with dual-class equity, offering transparency of our findings.

3.2 Data Collection

After establishing our final sample of IPO firms, we collected firm-level data from several providers to build a complete data set. The data we collected can be divided into three categories: Ownership data, Accounting data and firm characteristics, and IPO-related data.

- **Ownership and governance data:** Ownership and corporate governance data was sourced through a custom data request to Modular Finance AB. Modular Finance AB is a Swedish company specializing in ownership data for Swedish firms, and its database contains the most complete and updated ownership data available. Based on our final sample of 305 companies Modular Finance provided detailed and accurate data on each firm's share structure at the time of the IPO, and at year-end for every subsequent year until the end of 2022. Since Modular Finance tracks firms' different share types, and their associated voting power, their data is used as the primary source for obtaining our most important variable, whether the firm completed a DCL. The data provided by Modular Finance AB also takes ultimate ownership into account, allowing us to identify whether the ultimate owner was a founder at the time of the IPO. Modular Finance AB also provided us with financial and IPO-related data, which we used to cross-reference data collected from other sources, increasing reliability of our dataset.
- **Accounting data and firm characteristics:** Our primary source of accounting data is LSEG DataStream, formerly known as Refinitiv Eikon. Through their platform, we source data from both the DataStream and Worldscope databases. We collect P&L, Balance sheet, and Cash Flow data as year-end values from the IPO year and for at least five subsequent years if available. The data retrieved from DataStream is used to calculate the dependent variables for our analysis, as well as other control variables variables used in the regressions presented in Section 5.
- **IPO-related data:** Data from the time period before and at the time of the IPO is primarily hand-collected from the prospectuses and memorandums of all 305 firms. From here we retrieved the final offer price, pre- and post-money valuation, and founders percentages of both total capital and votes at the time of going public.

The IPO-related data primarily serves as instruments and controls for our first-stage probit, further discussed in section 4.2.2. We also use the web page Nyemissioner.se, along with IPO data from Bloomberg when available, to reduce the likelihood of mistakes that can occur when manually collecting data. By going through the prospectus of every company in our final sample we were also able to cross-check whether the firm actually went public with a DCL.

3.3 Descriptive Statistics

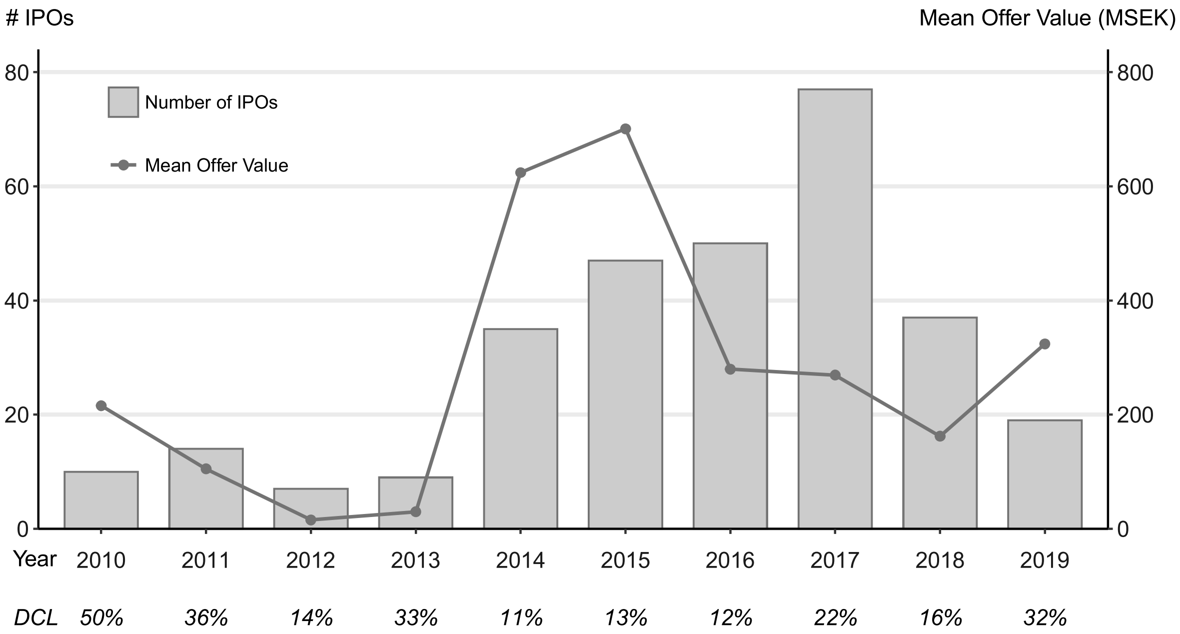
In this subsection, we present descriptive statistics for our sample. We begin by describing the final sample and addressing its representativeness, before describing the different variables we use in our analysis.

3.3.1 Representativeness

The final sample of 305 IPO firms conveys 59 firms (19.3%) that underwent a DCL and 246 (80.7%) opting for a single-class structure. As mentioned in section 2.4, the Swedish market represents a notable ambassador for dual-class share structures, which is reflected in our sample. Compared to most of the literature on the field, which is conducted in the U.S. (Gompers et al., 2010; Smart et al., 2008), the share of DCL in our sample is larger. More recent studies by Cremers et al. (2018) and Kim and Michaely (2019) indicate that the proportion of dual-class listings was quite stable up to 2010, before a steady increase, approaching 20% in 2018. In contrast, von der Crone and Plaksen (2010) found that in the Swiss market, a market more comparable to Sweden, there was a decreasing number of public duals, dropping from 50% in 1994 to 22% in 2008, although his sample was not specifically limited to new listings.

Contrary to the overall market trend in Sweden, the proportion of dual-class firms in our sample does not accurately mirror the market's actual ratio of duals versus singles. As mentioned in section 2.4 dual-class firms make up a majority of the Swedish market capitalization. Our sample has a much smaller proportion implies that for Sweden in general, larger and more established dual-class firms that are dragging the mean upwards. Such firms are naturally not part of our sample which mostly involves younger companies still in the growth phase of their life-cycle.

Figure 3.1: Annual number of IPOs and Offer Values



This figure displays the annual number of firms going public, shown on the left axis, alongside the annual mean offer value in million SEK, shown on the right axis. The percentage of firms going public with a dual-class structure is outlined below each year on the x-axis.

Investigating the time period of the IPOs in our sample we see evidence of the known and well-documented cyclicality of IPO markets (Yung et al., 2008). Figure 3.1 reveals that while both are cyclical, the cycles of mean offer value and number of IPOs do not necessarily align. The number of IPOs in our sample increases over the time period, peaking in 2017, while higher mean offer values occur when fewer, typically larger firms go public. This suggests that smaller firms are more likely to go public when markets are surging, while larger firms dominate IPOs when conditions are steadier. The percentage of DCLs varies from between 50.0% in 2010 to a low of 11.6% in 2014. While the percentage of duals fluctuates over the years, this must be seen in relation to the number of firms going public, and we find no prominent trend in their prevalence over our time period.

Table 3.2 presents an overview of the distribution of IPOs among sectors. For our sample, technology, healthcare, and industrials are the top sectors, which are also representative of the Swedish market as a whole, as presented in section 2.4. The amount of DCLs seems to be pretty evenly distributed among sectors, besides real estate and consumer non-cyclical where the split is even. However, it should be noted that the percentage ratio of duals in general seems to be higher for the sectors with the least number of observations.

Table 3.2: Sample Breakdown by Industry

Industry	**Firms (#)**	**Dual-Class (%)**	**Mean Offer Value (MSEK)**
Technology	89	15.7	201.77
Healthcare	87	16.1	277.30
Industrials	51	19.6	565.61
Consumer Cyclicals	34	11.8	641.27
Consumer Non-Cyclicals	14	50.0	168.13
Real Estate	14	50.0	557.10
Energy	9	11.1	51.84
Basic Materials	7	28.5	330.60
Total	**305**	**19.3**	**346.44**

This table illustrates a breakdown of the sample by industry based on The Refinitiv Business Classification (TRBC). Column 2 show the number of firms within each industry, column 3 indicate the share of dual-class firms, and column 4 shows the conditional mean of Offer Value for each industry, in million SEK.

Table 3.3 shows the distribution of our IPOs among the four major markets in Sweden. Interestingly, the percentage of dual-class firms seems to be higher for the more junior markets compared to Nasdaq Stockholm. We also note the large jump in mean offer value from Nasdaq's main market to First North, and subsequently from there to NGM and Spotlight.

Table 3.3: Sample Breakdown by Primary Markets

Market	**Firms (#)**	**Dual-Class (%)**	**Mean Offer Value (MSEK)**
Nasdaq FN	139	18.0	97.90
Spotlight	69	20.3	12.91
Nasdaq MM	64	15.6	1417.96
NGM	33	30.3	12.64
Total	**305**	**19.3**	**346.44**

This table illustrates a breakdown of the sample by market. Column 2 show the number of firms within each market, column 3 indicate the share of dual-class firms, and column 4 shows the conditional mean of Offer Value for each market, in million SEK.

3.3.2 Ownership and IPO Variables

A summary of descriptive statistics related to the IPO, including details on ownership and issuance, is presented in Table 3.4.

Table 3.4: Mean statistics of Ownership and IPO variables

Variable	**Full Sample**	**Dual-Class**	**Single-Class**	**P-Value**
Pre-Money[1]	717.56	417.79	789.46	*0.021***
Market cap. first close[1]	981.12	716.53	1,041.60	*0.194*
Offer Value[1]	346.44	164.77	390.02	*0.004****
Offer Value in %, total	0.292	0.243	0.304	*0.003****
Offer Value in %, primary	0.220	0.217	0.221	*0.817*
Firm Age at IPO	13.87	14.92	13.62	*0.697*
Founder Control	0.498	0.814	0.423	*0.000****
Founder Capital (%)	0.252	0.452	0.203	*0.000****
Founder Vote (%)	0.272	0.560	0.203	*0.000****
VC Involvement	0.351	0.068	0.419	*0.000****
IB Involvement	0.472	0.475	0.472	*0.967*
Nasdaq MM	0.210	0.169	0.220	*0.373*
Active	0.849	0.831	0.854	*0.670*
Number of Firms	**305**	**59**	**246**	

This table present the means for all ownership and IPO-related variables for each all 305 firms in our sample. Column 2 represents the mean for the full sample, while column 3 and 4 represents the conditional means for dual-class and single-class firms respectively. The final column to the right represents the p-value for t-tests of equal means across duals and singles. Variables with [1] indicate that numbers are in million SEK, remaining variables are ratios or dummies. A more extensive description of these variables can be found in appendix A.2. Respectively, *,** ,*** denote significant difference from zero at 10, 5, and 1 %.

Table 3.4 reports the means for IPO-related variables of our full sample, as well as for duals and singles respectively. The dual-class firms in our sample tend to be smaller in terms of pre-money valuation, and total offer value, both in relative and absolute terms, compared to single-class firms. The differences in means are significant at a 5% level. Dual-class firms are also smaller in market capitalization at first close. While not statistically significant, we would argue that a difference in means of 230 million SEK is economically significant. At first glance it might seem odd that duals are significantly smaller than singles, however, this can be attributed to a significant portion of dual-class firms in Sweden going public through other means than a traditional IPO. For example, including the market cap and offer value of the excluded spin-offs would even out these differences.

On average, the firms that went public in our time period went public after 13 years of incorporation, with dual-class firms usually staying private somewhat longer than single-class firms. Unsurprisingly dual-class firms have a much higher degree of founders who are still active and in control. Dual-class founders hold a significantly larger share of both capital and votes. Venture capital backing is more common for singles than for duals, but both types of firms seem to make equal use of investment banks to facilitate their IPOs. For our time period, there was also a larger percentage of singles listing on Nasdaq Stockholm's main market, which seems logical in light of the means regarding size as Nasdaq Stockholm is an exchange for significantly larger firms compared to its counterparts.

3.3.3 Accounting Variables

A summary of descriptive statistics related to the accounting variables is presented in Table 3.5.

Table 3.5: Descriptive Statistics of Accounting variables

Statistic	**Mean**	**SD**	**Min**	**Perc$_{25}$**	**Median**	**Perc$_{75}$**	**Max**
Q	3.66	3.87	0.29	1.50	2.46	4.59	60.44
Log Q	0.98	0.76	−1.25	0.40	0.90	1.52	4.10
Inverse Q	−0.48	0.34	−3.49	−0.67	−0.41	−0.22	−0.02
Leverage	0.15	0.19	0.00	0.00	0.07	0.25	1.42
ROA	−0.20	0.55	−12.66	−0.32	−0.08	0.09	1.75
Investments-to-Assets	0.09	0.78	0.00	0.001	0.01	0.05	30.84
Liquidity	3.61	4.71	0.06	1.08	1.98	4.15	51.41
Sales growth	1.03	2.99	−0.97	0.14	0.65	1.11	88.40
Dividend distributed	0.17	0.38	0	0	0	0	1
Total assets[1]	1,531	4,477	2	32	96	579	44,086
Total equity[1]	653	1,909	−51	19	61	341	27,387
Market capitalization[1]	2,002	7,071	2	74	249	1,077	177,251
Sales[1]	917	2,741	0	3	32	279	31,291
Firm-years: 1,708							

This table present descriptive statistics for all accounting variables related to year-end values for the IPO year and the five subsequent calendar years. Overall, these variables compromise 1,708 firm-years of observations for each variable. If the company delisted within five years, the variable is included until the preceding year-end of the delisting. Variables with [1] indicate that numbers are in million SEK, remaining variables are ratios or dummies. A more extensive description of these variables can be found in appendix A.2.

Table 3.5 shows that the average Tobin's Q for our sample is 3.7, with a median value of 2.5 indicating a significantly right-skewed distribution. The distributions of our two Q transformations, Log Q and Inverse Q, are more uniform. Further details on these are provided in section 4.1.1. The firms in our sample appear to be modestly leveraged, and a negative mean ROA suggests generally low profitability and operational efficiency. This is further suggested by a substantial left skew evident by a much lower mean (-0.197) than the median (-0.077). The means of both the investment ratio and liquidity ratio suggest a general trend of moderate investment levels and substantial liquidity among the firms. Sales growth appears to have a wide range that could indicate diverse growth trajectories among the firms, and the dividend-paying firm indicator suggests that a moderate number of firms in the sample are dividend-paying entities.

There is a notable challenge in determining Tobin's Q for dual-class firms as our computation hinges on the use of market capitalization. Specifically, since some shares are public while others are privately held, it is difficult to assess the true market value of the total number of shares. The superior voting shares are also likely to be valued at a premium over the restricted voting shares due to the additional control and decision-making power. However, we assume equal prices across all classes of shares, leaning on argumentation from Gompers et al. (2010) who argue that non-traded stocks only make up a small portion of the capital structure.

4 Methodology

This chapter presents the empirical methodology used to answer our hypotheses, much inspired by Adams et al. (2009), Gompers et al. (2010), and Smart et al. (2008). Applying transformed measures of Tobin's Q as a proxy for firm value, we run yearly single-stage OLS regressions, controlling for other firm characteristics that might affect valuation. Then, to address the endogeneity issue relating to a firm's decision to conduct a DCL, we perform an IV regression by adopting a three-stage procedure, as suggested by Adams et al. (2009). Following Gompers et al. (2010) and Smart et al. (2008), we use hypothesized determinants of DCLs to create generated instruments. Finally, we also conduct a first-difference regression over our entire period to asses the overall time-varying effect of dual-class listing. The remainder of this chapter is dedicated to discussing these methods in further detail, as well as addressing their underlying assumptions, biases, and violations.

4.1 Valuation measure

To investigate the effect of dual-class equity on firm valuation, we employ Tobin's Q as our valuation measure. Tobin's Q compares the market valuation of a firm's assets to the replacement cost of its assets (Reddy, 2020). The measure is based on the idea that the market valuation also reflects the market's expectations of the firm's future growth, as well as risk (Reddy, 2020). Our motivation for using Tobin's Q is its ability to capture valuation without directly relying on sales and earnings performance. As our sample consists of many smaller, growth firms, many of which report no sales and negative earnings across several firm years, Tobin's Q proves to be a precise valuation metric. As presented in section 2.5, several studies assess the impact of dual-class structures on firm value, where the majority of these apply Tobin's Q as their dependent variable, and average Tobin's Q has long been a workhorse of valuation studies (Gompers et al., 2010).

Since the replacement cost of assets is challenging to accurately determine, simplified definitions of Tobin's Q are frequently used in empirical studies. We follow the definitions of Adams et al. (2009) and Ikäheimo et al. (2007) where Tobin's Q is calculated as the book value of assets minus the book value of equity, plus the market value of equity, all divided by the book value of assets, as shown in Equation 4.1. Despite being an approximation of the true Tobin's Q, the implementation is more feasible and does not significantly affect the accuracy of the measure.

$$Q = \frac{Assets_{BV} - Equity_{BV} + Equity_{MV}}{Assets_{BV}} \tag{4.1}$$

Adams et al. (2009) stresses that for Tobin's Q to serve as a valuation metric under this definition, the book value of assets should always be included as a control variable. Holding the book value of assets constant, maximizing Tobin's Q is equivalent to maximizing the firm's market value. For comparison, the only difference between Adams et al. (2009) and Ikäheimo et al. (2007), and the definition of Tobin's Q employed by Gompers et al. (2010), is the deduction of deferred taxes in the numerator. Our version of Tobin's Q (Q) excludes deferred taxes to concentrate on the immediate market perception of firm value, influenced by tangible and operational assets, rather than accounting adjustments like deferred taxes.

4.1.1 Measurement error in Tobin's Q

While frequently used in valuation studies, Tobin's Q is not without its limitations and imperfections Gompers et al. (2010). This concern primarily arises from book values often not accurately reflecting the true value of assets. This is especially relevant for our sample where the two largest sectors are healthcare (28.5%) and technology (29.2%). These sectors usually have an asset base heavily composed of intangible assets, such as patents and proprietary tech, which is inherently difficult to accurately value. Furthermore, reporting regulations often require firms to value such intangibles conservatively. In other words, reported book value can significantly deviate from their actual replacement cost of assets, leading to measurement errors in Tobin's Q. Conversely, the market value of equity in the numerator is generally more accurate and less prone to error, although not entirely immune to inaccuracies, as discussed in section 3.4. These measurement errors could lead to uneven distributions around the mean and skew our results, making inference more difficult.

To address the measurement error in Tobin's Q, we apply two transformations of Q as our main independent variables, as suggested by Gompers et al. (2010). The first transformation is a logarithmic transformation of Tobin's Q to reduce the influence of outliers, normalizing the distribution. The second transformation is the inverse Q-ratio, effectively shifting the measurement error to the numerator. This significantly reduces the impact of outliers compared to Equation 4.1. To keep the interpretation of both transformations similar we use the negative of the inverse Q-ratio in our regressions. The two transformations are shown in Equation 4.2.

$$\text{Log } Q = \ln(Q), \quad \text{Inverse } Q = -1/Q \tag{4.2}$$

Unless otherwise specified, we use Tobin's Q, or just Q, interchangeably and as a general reference to both the definition from Equation 4.1, and the two transformations in Equation 4.2.

4.2 Single-stage Least Squares Estimation

Following the approach of Adams et al. (2009) and Gompers et al. (2010), we begin our analysis in section 5.2 by running a single-stage ordinary least squares (OLS) regression. This initial step is conducted to establish a baseline model against which more complex models can be compared, in addition to serving as a tool in evaluating the impact of the potential endogeneity bias in DCL. Our baseline model is presented in Equation4.3.

$$Q_i = \alpha + \gamma DCL_i + \boldsymbol{\beta}\mathbf{w}_i + \varepsilon_i \tag{4.3}$$

In our baseline model, Q_i represents a transformation of Tobin's Q for each firm, DCL_i indicates dual-class IPO, $\mathbf{w}_i$ is a vector of controls encompassing k distinct firm characteristics. The population parameters in the model are denoted by α, γ, and the vector $\boldsymbol{\beta}$. Lastly, ε_i represents the error term. We execute separate regressions for each year, starting in the year of the IPO (Year 0) and for the following five years. Conducting individual, yearly regressions enables us to address both short- and long-term effects.

4.2.1 Properties and Assumptions of OLS

Stock and Watson (2020) delves into the fundamental assumption of OLS regression, which includes linearity in parameters, random sampling, no perfect multicollinearity, homoscedasticity, no large outliers, and zero conditional mean. Fulfilling these assumptions ensures several desirable characteristics for the estimators. Particularly, coefficients will be *unbiased*, indicating that, on average, the estimator is equal to the true relationship between the dependent and independent variables. They will also be *consistent*, meaning that the probability of the estimate accurately representing the true population coefficient could be made arbitrarily high by increasing the sample size. Additionally, estimated parameters will also be *efficient* and *asymptotically normal*.

Although we generally believe the OLS assumptions hold for our model, the assumption of zero conditional mean poses a special challenge in our study. This assumption implies that the expected value of the error term, given any value of the independent variables, is zero. Should this condition not be satisfied, meaning the error term is correlated with the independent variable, it results in biased estimates (Hansen, 2022). This bias is known as an endogeneity problem (Morey & McGibney, 2017), and while it can stem from several issues, it is commonly caused by *omitted variables* or *simultaneous causality* (Stock & Watson, 2020).

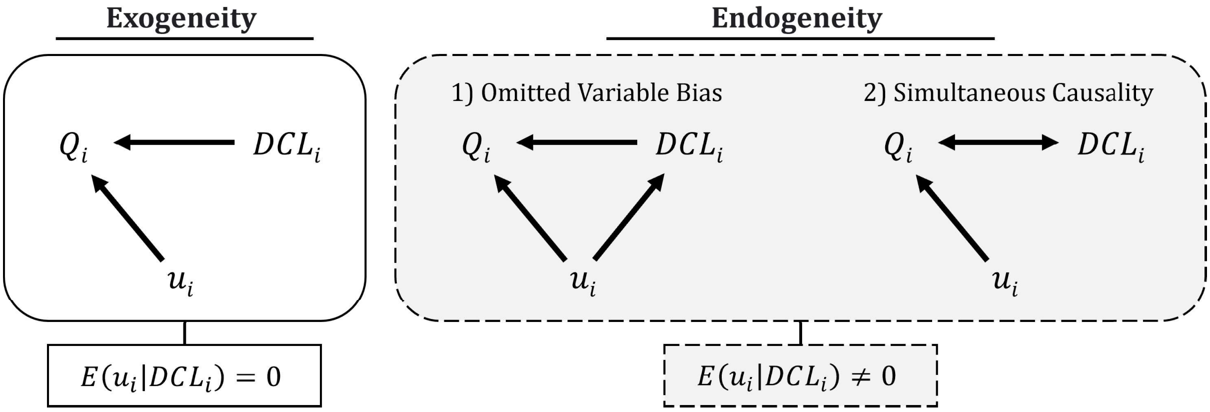
4.2.2 The Endogeneity Problem in Dual-class Listings

Evidence suggests that regressions with corporate governance variables such as dual-class equity suffer from clear endogeneity problems Gompers et al. (2010) and Morey and McGibney (2017). This poses a concern for our baseline model as it could be subject to biased estimators, along with inflated standard errors and p-values, leading to incorrect inferences and conclusions. Therefore, addressing this issue is crucial, especially as the suspicion of endogeneity is linked to our main independent variable DCL_i. We believe we have $E(u_i|DCL_i) \neq 0$, due to either:

1. Omitted variable bias: The error term jointly affects DCL_i and Q_i
2. Simultaneous causality: DCL_i and Q_i jointly affect each other.

The dynamics of the endogeneity issue are illustrated in Figure 4.1 below.

Figure 4.1: Exogeneity and two types of Endogeneity



The figure to the left illustrates a situation where the zero conditional mean assumption holds, and DCL_i is exogenous. The two figures to the right show a violation of the zero conditional mean assumption, where DCL_i is endogenous. The middle figure illustrates omitted variable bias, while the figure to the right illustrates simultaneous casualty.

Omitted variable bias occurs when a relevant variable is excluded from a regression model, usually due to missing data (Wooldridge, 2010, p. 50). Wooldridge (2010, p. 51) further notes that this bias frequently occurs in cases of self-selection into 'treatment'. In light of our dual-class structures, Smart et al. (2008) argues for such self-selection, claiming that firms that conduct DCL are systematically different from those that do not. When these differentiating characteristics are observable and affect firm value, they can be controlled for by inclusion in the regression model. However, unobservable traits, cannot be included, resulting in a violation of the zero conditional mean assumption, leading to biased coefficients. In our case of DCL, one such factor could be related to the skill, experience, and idiosyncratic vision of the firm's founder. These factors are hard to observe and quantify but could have a significant impact on *both* the decision to adopt a dual-class structure and the firm's value, as discussed in section 2.3.

Simultaneous casualty bias occurs when the dependent and independent variable is jointly determined Wooldridge (2010, p.51). Since we study the effect of dual-class equity on firm valuation, we encounter this bias when a firm's valuation influences a firm's choice between dual-class or single-class stock at the IPO. Scholars argue that this is plausible, indeed that the market allows higher valuation firms to choose dual-class firms (Cremers et al., 2018; Morey & McGibney, 2017). Gompers et al. (2010) adds to this by asserting that if controlling shareholders perceive their firm as undervalued, they might see greater advantages in adopting a dual-class structure, as it provides a powerful takeover protection. Under these circumstances, γ is likely to betray a negative bias. Despite some firm characteristics used as controls may also be endogenously determined with Q, the interpretation of these coefficients is not in our focus, and such bias is thereby not a problem for our analysis.

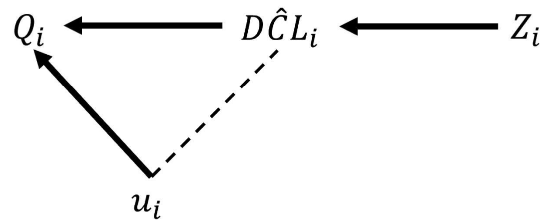
4.3 Three-stage Instrumental Variable Estimation

To address endogeneity concerns arising from omitted variable bias and simultaneous casualty, we utilize an instrumental variables method. More specifically, our methodology consists of a three-stage procedure, to account for our exogenous variable is binary.

4.3.1 The general IV model

Instrumental variable (IV) regression is a method to obtain a consistent estimator of the population coefficients when the zero conditional mean assumption is violated (Stock & Watson, 2020). IV regression addresses the issue of endogeneity by utilizing instruments. Instruments are variables that correlate with the endogenous explanatory variables but are uncorrelated with the error term. As illustrated in Figure 4.2, an instrument Z_i breaks the endogenous DCL_i into two parts: one endogenous part, which we leave out, and one exogenous part $D\hat{C}L$, which we keep. This enables consistent estimation of regression coefficients (Stock & Watson, 2020).

Figure 4.2: A solution for the Endogeneity problem: IV regression



The figure illustrates the premise of the general IV regression where an instrument Z_i is utilized to break the endogenous regress or DCL_i into two parts: one endogenous part that is left out, and one exogenous part $D\hat{C}L$ that is uncorrelated with the error term.

Usually, an IV regression is performed in an estimation procedure known as two-stage least squares (TSLS) (Angrist & Pischke, 2009). TSLS, as the name suggests, consists of running two consecutive OLS regressions. In the first stage, the endogenous variable is regressed on the instruments, subsequently producing fitted values. In our case, this means regressing DCL_i on Z_i to produce $D\hat{C}L_i$. In the second stage, the fitted values replace the endogenous variable in the main model, in our case, regressing Q_i on $D\hat{C}L_i$.

4.3.2 Instrument Validity

In order for the process of IV regression to properly function, the instrumental variable Z_i needs to be valid. This requires two conditions to be fulfilled, namely *relevance* and *exogeneity* (Hansen, 2022).

- **Instrument relevance:** For an instrument to be relevant the variation in the instruments must correlate with the variation in DCL_i, i.e., $COV(Z_i, DCL_i) = 0$ (Stock & Watson, 2020). The condition is met as long as at least one instrument effectively explains DCL_i. Instruments with low explanatory effect on the endogenous variable are known as weak instruments and lead to unreliable estimations. For our three-stage procedure, there is no standardized formal test for instrument strength. Therefore, we follow the approach of Adams et al. (2009) and rely on the z-statistics of our first-stage regression to assess relevancy.
- **Instrument exogeneity:** For an instrument to be exogenous it must be uncorrelated with the residual term in the final-stage regression, i.e., $COV(Z_i, \varepsilon_i) = 0$ (Hansen, 2022). Violation of this condition results in the instruments facing the equivalent endogeneity problems as the original endogenous variable. There only exists partial tests for instrument exogeneity, and since these tests give no definite answers, common practice is to use judgment and economic reasoning to decide if the instruments are plausibly exogenous.

4.3.3 The Binary Endogenous Variable Problem

Our model encounters a problem with the regular TSLS due to our binary endogenous variable, DCL_i. Performing an OLS model in the first stage would bring along the weaknesses of the linear probability model which would yield imprecise estimates and inefficient coefficients. Hence we are inclined to conduct a nonlinear first-stage, but applying TSLS reasoning directly to nonlinear models has been termed the "forbidden regression" by MIT professor Jerry Hausman (Angrist & Pischke, 2009, p. 142) as it only yields consistent estimates under very restrictive assumptions (Wooldridge, 2010, p. 256-268). The inconsistency arises because, in nonlinear regressions, due to the use of cumulative distribution functions, the impact of each variable is contingent on the values of other variables. As a result, even when the instrument Z_i and the second-stage error term ε_i are uncorrelated, this independence does not extend to the fitted values (Huntington-Klein, 2021). Only an OLS first-stage in a TSLS is guaranteed to produce fitted values that are uncorrelated with the residuals of the second-stage (Angrist & Pischke, 2009, p. 143). Consequently, we need to create a workaround to this forbidden step of applying the fitted values from a nonlinear first stage into a second stage to handle the endogeneity.

Wooldridge (2010, p. 939) suggests that the issue of a binary endogenous variable could be dealt with by using nonlinear fitted values from a probit model as *instruments* in a conventional TSLS. In other words, this implies a *three-stage* procedure where nonlinear fitted probabilities, are used as instruments to avoid the problems of an incorrect nonlinear first-stage. This approach is also suggested by Angrist and Pischke (2009), and employed in practice by Adams et al. (2009). We can summarize the procedure in three steps:

1. Regress DCL_i on the instruments Z_i and some other controls X_i using a probit specification and determinants of DCL_i as instruments, before obtaining the nonlinear fitted probabilities $\hat{\Phi}$.

2. Regress DCL_i on the nonlinear fitted probabilities $\hat{\Phi}$ as instruments with W_i and X_i as controls with an OLS, and retrieve the fitted values $D\hat{C}L_i$.

3. Regressing Q_i on the fitted values from the second stage $D\hat{C}L_i$ and other controls W_i and X_i in a final OLS regression.

Adams et al. (2009) highlights three key benefits of the three-stage approach. Firstly, it adeptly handles the binary nature of the endogenous variable. Second, this approach does not require the binary model specification to be correct, only that the instruments are correlated with the probability of firms opting for a DCL. Lastly, despite the first stage producing some of the regressors, the instrumental variable standard errors are still valid in the long term, as explained by Wooldridge (2010, p. 939). This robustness adds to the appeal of the three-stage approach in our analysis.

4.3.4 Discussion of the Determinants of Dual-Class Listings

For our first-stage probit model, we need to determine the instrumental variables, crucial for any sense of inference. We draw upon the methodology used by (Gompers et al., 2010; Smart et al., 2008; von der Crone & Plaksen, 2010) and employ hypothesized determinants to correct for the endogenous decision of DCL. The economic reasoning for our choice of determinants and their validity is presented below

Founder Vote

The first variable we employ as an instrument is a continuous variable representing the voting stake held by the founder, or the founder's family, prior to the equity issuance related to the IPO. In the case of multiple founders, we accumulate their stake to capture the overall control of the founder group. This approach aligns with the arguments of Gompers et al. (2010), advocating for founder involvement as an instrument. Moreover, our study benefits from a smaller sample, enabling a more nuanced examination of not only the active involvement of founders at IPO but also the magnitude of their voting stake. Founders voting stake serves as a proxy for the founders' emotional attachment to their company, encompassing the idiosyncratic vision and affection value for the firm. Founders with a high degree of attachment are likely to place a high value on control and are hence more eager to opt for dual-class IPOs rather than a single-class listing. We claim that founders who exhibit these traits are more likely to position themselves with greater control pre-IPO, consequently holding a larger voting stake at this stage. Subsequently, we argue that the likelihood of a firm choosing DCL increases with the founder's voting stake, emphasizing the instrument's relevance.

A valid instrument must also be uncorrelated with firm valuation. Several scholars argue in the direction that the composition of ownership structure and managerial control, while important, do not directly correlate with or determine the firm's market performance as measured by metrics like Tobin's Q (e.g., Daily & Dalton, 1992; Demsetz & Villalonga, 2001; Willard et al., 1992). Drawing on the rationale of Gompers et al. (2010), Morey and McGibney (2017), and von der Crone and Plaksen (2010) which apply similar determinants as instruments, it is argued that controlling for other characteristics that influence firm value will sufficiently reduce bias, thereby ensuring the instrument's validity.

VC Involvement

Our second instrument is an indicator variable indicating whether a VC fund holds at least 10 % of the voting stake prior to the equity issuance related to the IPO. VCs usually exercise some pre-IPO control, and the IPO represents an exit opportunity for VCs (Smart et al., 2008). Smart et al. (2008) argue that VCs will be pushing for a single-class listing as this aligns more with their incentives of maximizing value at exit. Following Smart et al. (2008) we expect the presence of a VC investor to discourage a DCL. Moreover, Smart et al. (2008) supports the utilization of VC involvement as an instrumental variable, considering its potential impact on strategic decisions while being sufficiently detached from the immediate market valuation concerns, especially when other influential factors are controlled for.

Age

Our third instrument is the age of the firm at the time of IPO. This variable to reflect the firm's maturity and stage in the business life-cycle (Gompers et al., 2010). We use this instrument to account for the fact that more mature firms also tend to have a weaker link with their initial founders simply due to the natural passage of time. We hypothesize that younger generations of owners are likely to have a diminished psychological attachment to the firm their ancestors established or used to own. At the same time, a firm's age by itself is a historical characteristic that should have little influence on the firm value, once industry effects, profitability, dividends, and share of industry sales are taken into account (von der Crone & Plaksen, 2010).

Closing Remarks on Instruments

In general, the validity of our instruments is further supported by the temporal separation between the instruments variables, collected at the time of the IPO, and the subsequent year-end measurements of Q_i. This approach, where earlier data is used to predict later outcomes, reduces the potential correlation between instruments and firm value. This reasoning aligns with the understanding that markets, while incorporating historical information, predominantly focus on current and future information (Ogle, 2020). Furthermore, including control variables to account for additional factors affecting firm value helps us further mitigate the potential for endogeneity in our instruments.

4.3.5 Our Three-stage Model Equations

Our first-stage model consists of a probit model that models the probability of conducting a DCL based on the hypothesized determinants presented above. The probit model applies the cumulative standard normal distribution, $\Phi(\cdot)$, and is given in Equation 4.4.

$$P(DCL_i = 1 \mid \mathbf{z_i}, \mathbf{x}_i) = \Phi(\pi + \omega_1 FV_i + \omega_2 VC_i + \omega_3 Age_i + \boldsymbol{\theta}\mathbf{x}_i) \tag{4.4}$$

Here, DCL_i denotes the binary outcome of whether the i-th firm chooses a DCL, the vector $\mathbf{z_i} = (FV_i, VC_i, Age_i)$ comprises our instrumental variables, including founder's voting stake FV_i, whether the firm is venture-backed VC_i, and the firm's age Age_i. Corresponding coefficients for the instruments are noted as $\omega_1, \omega_2, \omega_3$, respectively. Moreover, π represents the intercept term, $\mathbf{x}_i$ is a vector of IPO-related control variables, and $\boldsymbol{\theta}$ is the corresponding vector of coefficients.

After obtaining the fitted probabilities from Equation 4.4, our second-stage model is regressing DCL_i on these fitted probabilities as a generated instrument as presented in Equation 4.5.

$$DCL_i = \phi + \mu\hat{\Phi} + \boldsymbol{\rho}\mathbf{x}_i + u_i \tag{4.5}$$

Here, $\hat{\Phi}$, denotes the fitted probabilities from the first-stage probit, μ represents the coefficient associated with $\hat{\Phi}$. Furthermore, ϕ represents the intercept term, while $\boldsymbol{\rho}$ represents a vector of coefficients associated with the controls in vector $\mathbf{x}_i$. Lastly, u_i represents the error term.

Our third-stage model is regressing Q_i on the fitted values values obtained from Equation 4.6.

$$Q_i = \alpha + \gamma D\hat{C}L_i + \boldsymbol{\beta}\mathbf{w}_i + \boldsymbol{\lambda}\mathbf{x}_i + \varepsilon_i \tag{4.6}$$

Where Q_i represents a transformation of Tobin's Q for each firm, $D\hat{C}L_i$ is the fitted values of choosing a dual-class IPO, and γ represents the coefficient measuring the effect of the choice of a dual-class IPO on firm value. $\mathbf{w}_i$ is a vector of year-end accounting variables. Moreover, α denotes the intercept term, while $\boldsymbol{\beta}$ and $\boldsymbol{\lambda}$ both represent vectors of coefficients associated with the two sets of controls in $\mathbf{w}_i$ and $\mathbf{x}_i$, respectively. Finally, ε_i represents the error term.

We execute separate regressions for each year, starting in the year of the IPO (Year 0) and for the following five years. Additionally, we also run a pooled OLS of all firm-years combined. The only modification to Equation 4.6 is the inclusion of event year dummies. Conducting individual, yearly regressions enables us to address both short- and long-term effects, and the combined regression allows us to address the total impact.

4.4 First-difference Estimation

To investigate the overall effect on of dual-class equity on firm value over time we employ a first-difference regression between year 5 and year 0. This allows us to analyze what effects changes in the firm value over our entire time period. Additionally, by focusing on the differences rather than absolute levels, we can effectively control for unobserved, time-invariant characteristics, such as omitted variables, that might bias our results (Hansen, 2022).

Since our dependent variable DCL_i does not vary over time, we encounter a problem, as conducting a first-difference on Equation 4.6 would lead to all time-invariant variables being dropped. However, we believe that despite DCL_i being time-invariant, it still has time-varying effects on Q_i. Hence, we include a binary variable, d_t , taking the value of one for observation in event year 5 ($t = 5$), and an interaction term between DCL_i and d_t in our Equation 4.6. To obtain the first-difference we need to subtract the year 0 values from the year 5 values, as presented in Equation 4.7.

$$Q_{i5} - Q_{i0} = \xi(d_5 - d_0) + \gamma(d_5 \cdot D\hat{C}L_i - d_0 \cdot D\hat{C}L_i) + \boldsymbol{\beta}(\mathbf{w}_{i5} - \mathbf{w}_{i0}) + \varepsilon_{i5} - \varepsilon_{i0} \tag{4.7}$$

Where, d_t represents a dummy variable for event year 5 observations, and ξ is its associated coefficient. The subscripts i, t denote characteristics that differ by firm and event year respectively. The time-invariant components of Equation 4.6, α and $\mathbf{x_i}$, are out of our equation, but $D\hat{C}L_i$ is kept through the interaction term with d_t. This leaves us with Equation 4.8

$$\Delta Q_{i,5} = \xi + \gamma D\hat{C}L_i + \boldsymbol{\beta}\Delta\mathbf{w}_{i,5} + \Delta\varepsilon_{i,5} \tag{4.8}$$

Where ΔQ_{it} represents the change in Tobin's Q for each firm between years 0 and 5. ξrepresents time-trend in Q_{it}. $D\hat{C}L$ are the fitted values, and γ is the impact of dual-class equity on firm value with time. Δw_{it} and $\boldsymbol{\beta}$ represent the effect of changes in year-end accounting variables. Lastly, $\Delta\varepsilon_{it}$ denotes the change in the error term, capturing unobserved effects.

5 Analysis

This section presents the findings obtained using the methodology described in section 4. We begin by presenting the results of our single-stage OLS. Following this, we examine the findings from our first-stage probit regression, before reviewing the outcomes from the subsequent three-stage procedure. Lastly, we present our first-difference estimation.

5.1 Single-stage OLS Estimates

We initiate our analysis by conducting the single-stage OLS estimation presented in Equation 4.3, examining the relationship between DCL and firm valuation. We report our results for Log Q in Table 5.1 and Inverse Q in Table 5.2, with yearly regressions for each year following the IPO. Along with regressing on whether the firm went public with dual-class equity or not, we include various control variables to adjust for systematic differences across firms. This allows us to isolate the impact of firm-specific characteristics. We also include IPO year and industry controls in all regressions, and correct standard errors for heteroscedasticity.

In Table 5.1, DCL is negatively associated with Log Q for all observed years, with the exception of year 4. However, the corresponding t-statistics are low and far from significant, peaking at -0.65 in year 3. Table 5.2 shows similar results for Inverse Q, with a negative coefficient in all years, and year 3 exhibiting the highest t-static of -1.33. These results suggest a negative, but insignificant, relationship between firm value and the choice of dual-class equity at the IPO, under straightforward OLS assumptions.

In both tables, the additional explanatory variables have the anticipated correlations with Q, although these coefficients are rarely statistically strong. Book value of assets consistently exhibits a significant negative relationship at the 1% level across all years for Log Q, with similar results for Inverse Q. Leverage negatively correlates with both dependent variables in all years except year 4, but with lower and more varied significance than total assets. We also note that the results indicate that firms that invest more in fixed assets and R&D tend to correlate with a higher Q, with varied degrees of significance coefficients in the first years following the IPO. Apart from several of the industry and IPO year variables exhibiting consistent significance (omitted from the table), the remaining control variables display varying signs and significance levels.

Table 5.1: Single-stage OLS Regressions on the effect of DCL on Log Q

	Dependent variable: Log Q					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
DCL	−0.053	−0.016	−0.039	−0.073	0.032	−0.012
	(−0.60)	(−0.16)	(−0.39)	(−0.65)	(0.26)	(−0.11)
Log Assets	−0.131***	−0.123***	−0.088***	−0.080***	−0.137***	−0.111***
	(−5.71)	(−4.77)	(−3.64)	(−2.89)	(−4.61)	(−3.19)
Leverage	−0.506*	−0.580*	−0.877***	−0.584*	−0.180	−0.682***
	(−1.84)	(−1.82)	(−3.61)	(−1.75)	(−0.61)	(−2.71)
ROA	0.048	−0.008	−0.054	−0.239**	−0.031	0.218
	(0.48)	(−0.10)	(−0.38)	(−2.22)	(−1.22)	(1.24)
Investments-to-Assets	0.159*	0.023***	0.091*	0.629*	0.586	0.730
	(1.75)	(3.74)	(1.92)	(1.82)	(1.14)	(1.62)
Liquidity	−0.001	0.003	0.015	0.015	0.028***	0.010
	(−0.19)	(0.29)	(1.21)	(1.14)	(3.22)	(0.83)
Sales Growth	0.023	−0.017	−0.005	0.007	0.004	0.027
	(1.33)	(−1.20)	(−0.41)	(0.32)	(1.30)	(0.70)
Dividend distributed	0.122	0.017	0.158	0.201	0.435***	0.359**
	(1.15)	(0.15)	(1.37)	(1.44)	(2.79)	(2.29)
Constant	1.497***	1.442***	1.664***	1.638***	1.290***	1.202**
	(5.26)	(4.60)	(4.83)	(4.31)	(4.02)	(2.58)
IPO Year & Ind. contr.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.289	0.254	0.268	0.281	0.259	0.246
Observations	305	305	304	297	271	226

This table presents single-stage OLS estimations by event year. The estimation period is 2010–2019. The dependent variable is the log of a proxy of Tobin's Q, where Q is book value of assets minus book value of equity plus market value of equity divided by book value of assets. DCL is an indicator variable for firms with dual-class IPO. Log Assets is the log of total assets. Leverage is interest-bearing debt divided by total assets. ROA is EBITDA divided by total assets. Investments-to-Assets is capex plus R&D spend, divided by total assets. Liquidity is current assets divided by current liabilities. Sales Growth represents CAGR over the preceding 2 years. Dividend distributed is a dummy indicating if the firm distributed dividends that year. The regressions include Industry and IPO Year dummies. Parentheses enclose t-statistics adjusted for heteroskedasticity, while ***, **, and * denote significant difference from zero at 1, 5, and 10 %, respectively.

Table 5.2: Single-stage OLS Regressions on the effect of DCL on Inverse Q

	Dependent variable: $-1/Q$					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
DCL	−0.022	−0.014	−0.022	−0.070	−0.013	−0.006
	(−0.61)	(−0.32)	(−0.52)	(−1.33)	(−0.25)	(−0.12)
Log Assets	−0.053***	−0.055***	−0.041***	−0.036**	−0.063***	−0.048***
	(−4.90)	(−4.65)	(−4.05)	(−2.50)	(−4.84)	(−2.82)
Leverage	−0.228*	−0.225*	−0.313***	−0.187	0.080	−0.245*
	(−1.79)	(−1.91)	(−3.10)	(−1.61)	(0.59)	(−1.95)
ROA	0.023	−0.020	0.009	−0.063**	−0.014	0.155
	(0.57)	(−0.64)	(0.31)	(−2.10)	(−1.34)	(1.13)
Investments-to-Assets	0.028	0.003	0.045**	0.255*	−0.004	0.219
	(0.58)	(1.45)	(2.42)	(1.77)	(−0.02)	(1.21)
Liquidity	−0.002	0.001	0.004	0.006	0.014***	0.003
	(−0.55)	(0.09)	(0.79)	(1.01)	(3.74)	(0.86)
Sales Growth	0.005	−0.009	−0.003	0.011	0.002	0.005
	(0.82)	(−1.48)	(−0.58)	(1.06)	(0.95)	(0.25)
Dividend distributed	0.052	0.023	0.072	0.098	0.223***	0.178***
	(1.02)	(0.42)	(1.42)	(1.56)	(3.12)	(2.72)
Constant	−0.288**	−0.354**	−0.281*	−0.253	−0.397**	−0.491***
	(−2.21)	(−2.11)	(−1.80)	(−1.38)	(−2.25)	(−2.61)
IPO Year & Ind. contr.	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.251	0.267	0.269	0.205	0.258	0.186
Observations	305	305	304	297	271	226

This table presents single-stage OLS estimations by event year. The estimation period is 2010–2019. The dependent variable is the inverse of a proxy of Tobin's Q, where Q is book value of assets minus book value of equity plus market value of equity divided by book value of assets. DCL is an indicator variable for firms with dual-class IPO. Log Assets is the log of total assets. Leverage is interest-bearing debt divided by total assets. ROA is EBITDA divided by total assets. Investments-to-Assets is capex plus R&D spend, divided by total assets. Liquidity is current assets divided by current liabilities. Sales Growth represents CAGR over the preceding 2 years. Dividend distributed is a dummy indicating if the firm distributed dividends that year. The regressions include Industry and IPO Year dummies. Parentheses enclose t-statistics adjusted for heteroskedasticity, while ***, **, and * denote significant difference from zero at 1, 5, and 10 %, respectively.

Our results are comparable to the initial OLS results of von der Crone and Plaksen (2010), which also observe an initial negative correlation between dual-class structures and total assets on Q. Moreover, they also find a positive of liquidity and investments, though their results are far more significant. However, OLS estimation indirectly assumes that DCL is randomly allocated among different firms in the sample. As this assumption does not seem to be valid, the estimated coefficients are likely to be biased due to endogeneity problems. The single-stage OLS results should therefore be interpreted with caution, and only provide descriptive insights.

5.2 Three-stage IV Estimates

We correct for endogeneity in our dependent variable through our three-step procedure. We begin by estimating the first-stage probit model presented in Equation 4.4. In addition to regressing on our proposed instruments, we include controls for the total percentage of the firm offered in the IPO, an indicator variable for IB involvement, a Nasdaq main market indicator variable, lagged market return, and the logarithm of pre-money and offer value. Table 5.3 reports the results of our first-stage probit regression.

Across all three model specifications in Table 5.3, founders' voting stake is positively associated with a higher likelihood of a DCL, significant at the 1% level with robust z-statistics of 5.99, 5.93, or 6.01, depending on the specification. Similarly, VC-backed firms are significantly less likely to conduct a DCL, with significance at the 5% level for model 1, and at the 10% level for model 2 and 3, and z-statistics of -2.06, -1.93 or -1.95 respectively. Firm age is positively associated with the probability of DCL at the 5% significance level across all specifications. These results reveal that all of our instruments are correlated with DCL, and based on our z-statistics, none of our model specifications appear to suffer from potential problems with weak instruments.

Furthermore, firms offering a larger percentage to the public seem more likely to list with dual-class equity, significant at the 10% level in models 1 and 2. Apart from some year and industry indicators, no other variables significantly influence the dual-class decision in our three model specifications.

Table 5.3: First-stage Probit Regression: The Determinants of Dual-class Listing

	Dependent variable: DCL		
	Model 1	Model 2	Model 3
Founder Vote	2.249***	2.226***	2.230***
	(5.99)	(5.93)	(6.01)
VC Involvement	−0.719**	−0.686*	−0.679*
	(−2.06)	(−1.93)	(−1.95)
Age at IPO	0.014**	0.014**	0.014**
	(2.19)	(2.20)	(2.36)
Offer value %	−1.711*	−1.763*	−1.560
	(−1.77)	(−1.75)	(−1.53)
IB Involvement	0.220	0.256	0.248
	(0.83)	(0.91)	(0.88)
Nasdaq MM	0.108	0.162	0.179
	(0.28)	(0.33)	(0.37)
Lagged market return		2.309	2.269
		(0.84)	(0.85)
Log Pre-Money		−0.035	
		(−0.29)	
Log Offer Value			−0.112
			(−0.95)
IPO Year & Ind. contr.	Yes	Yes	Yes
Pseudo R2	0.390	0.393	0.385
Log Likelihood	-91.401	-90.998	-92.177
Observations	305	305	305

This table presents the first-stage probit regression estimating the probability of a dual-class listing. The estimation period is 2010–2019. The dependent variable is a dummy equal to one if the firm went public with dual-class equity. Fonder Vote is the percentage of votes held by the founder, or the founder's family, at the time of the IPO. VC Involvement is a dummy equal to one if a VC fund financed the firm pre-IPO. Age at IPO is the firm age in years at the IPO. Offer Value % is the ratio of total shares offered divided by total shares outstanding after the offering. IB Involvement is an indicator variable equal to one if an investment bank facilitated the offering. Nasdaq MM is an indicator variable equal to one if the firm went public on the main market of Nasdaq Stockholm. Log Pre-Money is the total number of shares before the offering multiplied by the CPI-adjusted final offer price. Lagged market return is the daily compounded return on OMX Small Cap PI index over the 22 trading days preceding the IPO. Log Offer value is the total number of shares offered times the CPI-adjusted offer price. The regressions include Industry and IPO Year dummies. Parentheses enclose robust z-statistics, while ***, **, and * denote significant difference from zero at 1, 5, and 10 %, respectively.

We choose to go further with model specification 2. Although the z-statistics across all models is nearly identical, model 2 has the highest pseudo-R2 and the lowest Log Likelihood among the specifications, assuring a more robust fit for our analysis.

Next, we obtain the fitted values from the probit model 2 and run the second-stage regression following Equation 4.5. The second-stage regression serves as an intermediate step and is left out of this section. The results are included in Appendix B.1, Table B.1.

We estimate the third-stage regression by using the fitted values from the second-stage regression, as presented in Equation 4.6. On par with the single-stage OLS, we run yearly regressions for each valuation measure and event year. To assess the overall impact, we additionally conduct a pooled regression using data from all 1,708 firm-years combined. Our independent variable is the fitted values from our second-stage regression, $D\hat{C}L$. In addition to including control variables for firm characteristics, IPO year, and industry controls, we also include the controls from our first-stage probit for robustness. Additionally, we correct standard errors for heteroskedasticity for the yearly regressions and adjust the combined model for both heteroskedasticity and firm-level clustering.

The main results of this thesis are presented in Table 5.4 and 5.5. The tables present the causal effects of dual-class IPOs on Log Q and Inverse Q. The results for the yearly regression on both Q-transformations indicate that firms opting for dual-class equity at their IPO tend to experience significantly higher Q for the end of the IPO year, as well as the first and second year following the IPO. The coefficients are also positive for years 3 until 5, but statistically insignificant. However, the combined model overall event years reveal a significant positive effect at the 1% level for both transformations, adding weight to the causal effect of dual-class equity on firm valuation. In combination with findings from the regressions year by year, this indicates that dual-class firms consistently trade at a premium relative to single-class firms.

Other controls remain similar to the results from the single-stage OLS in Table 5.1 and 5.2. Intuitively, the IPO-related controls increase the model's fit and show significant impact in the IPO year, before their impact and explanatory power gradually diminish over time.

Summarizing our main analysis, we find that after correcting for endogeneity we find evidence of a causal positive effect of dual-class equity on firm valuation. Compared to our single-stage OLS estimates, the third-stage estimates are larger, suggesting that $Cov(DCL_i, \varepsilon_i) < 0$. Hence, ignoring endogeneity leads to an underestimation of the effect of dual-class equity on firm valuation.

Table 5.4: Third-stage IV Regression on the effect of DCL on Log Q

	Dependent variable: Log Q						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Combined
DCL fitted values	0.408***	0.417**	0.376**	0.281	0.333	0.320	0.368***
	(2.94)	(2.29)	(2.13)	(1.32)	(1.36)	(1.33)	(4.51)
Log Assets	−0.535***	−0.337***	−0.217***	−0.189***	−0.205***	−0.179***	−0.243***
	(−12.58)	(−5.63)	(−3.67)	(−3.89)	(−4.28)	(−3.32)	(−12.37)
Leverage	0.082	−0.279	−0.678***	−0.552*	−0.250	−0.819***	−0.476***
	(0.31)	(−0.93)	(−2.80)	(−1.73)	(−0.87)	(−3.04)	(−4.43)
ROA	0.137	0.091	0.036	−0.157	−0.016	0.254	0.014
	(1.36)	(1.11)	(0.23)	(−1.45)	(−0.51)	(1.39)	(0.40)
Investments-to-Assets	0.186**	0.025***	0.096*	0.638*	0.556	0.791*	0.042**
	(2.35)	(3.94)	(1.87)	(1.71)	(1.06)	(1.70)	(2.07)
Liquidity	0.001	0.006	0.018	0.018	0.030***	0.010	0.012***
	(0.10)	(0.61)	(1.46)	(1.31)	(3.37)	(0.86)	(3.13)
Sales Growth	0.024	−0.015	0.004	0.032	0.005	0.047	0.007
	(1.55)	(−1.12)	(0.37)	(1.28)	(1.28)	(1.10)	(1.31)
Dividend distributed	−0.059	−0.017	0.088	0.119	0.312**	0.239	0.088
	(−0.73)	(−0.17)	(0.80)	(0.84)	(2.02)	(1.43)	(1.61)
Offer value %	0.976***	0.237	0.233	0.375	0.526	0.263	0.348**
	(4.67)	(0.88)	(0.80)	(1.24)	(1.50)	(0.73)	(2.48)
IB Involvement	−0.143	−0.053	0.038	−0.049	−0.136	−0.005	−0.079*
	(−1.62)	(−0.57)	(0.38)	(−0.39)	(−1.09)	(−0.04)	(−1.77)
Nasdaq MM	−0.173*	−0.055	−0.080	−0.127	0.009	0.286	−0.071
	(−1.80)	(−0.38)	(−0.52)	(−0.76)	(0.04)	(1.20)	(1.06)
Lagged market return	0.010	−0.682	−1.408	−1.648	−0.596	−0.331	−0.763*
	(0.02)	(−0.76)	(−1.54)	(−1.64)	(−0.65)	(−0.31)	(−1.93)
Log Pre-Money	0.551***	0.287***	0.174***	0.183***	0.127*	0.066	0.213***
	(11.20)	(4.36)	(2.61)	(3.01)	(1.78)	(1.02)	(8.55)
IPO-Year & Ind. contr.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event Year contr.	-	-	-	-	-	-	Yes
Adjusted R^2	0.493	0.313	0.294	0.297	0.264	0.261	0.245
Observations	305	305	304	297	271	226	1,708

This table presents three-stage IV regressions by event year and combined for all firm-years. The estimation period is 2010–2019. The dependent variable is the log of a proxy of Tobin's Q, where Q is book value of assets minus book value of equity plus market value of equity divided by book value of assets. DCL fitted values are the predicted linear probabilities from the second-stage regression. Log Assets is the log of total assets. Leverage is interest-bearing debt divided by total assets. ROA is EBITDA divided by total assets. Investments-to-Assets is capex plus R&D spend, divided by total assets. Liquidity is current assets divided by current liabilities. Sales Growth represents CAGR over the preceding 2 years. Dividend distributed is a dummy indicating if the firm distributed dividends that year. Offer value % is the ratio of total shares offered divided by total shares outstanding after the offering. IB Involvement a dummy indicating if an investment bank facilitated the offering. Nasdaq MM is a dummy indicating if the firm went public on the main market of Nasdaq Stockholm. Log Pre-Money is the log of total shares outstanding before the offering times the CPI-adjusted offer price. Lagged market return is the daily compounded return on OMX Small Cap PI index over the 22 trading days preceding the IPO. The regressions include Industry and IPO Year dummies. Parentheses enclose t-statistics adjusted for heteroskedasticity, and clusters for the combined model, while ***, **, and * denote significant difference from zero at 1, 5, and 10 %, respectively.

Table 5.5: Third-stage IV Regression on the effect of DCL on Inverse Q

	Dependent variable: $-1/Q$						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Combined
DCL fitted values	0.162***	0.157*	0.178**	0.091	0.064	0.133	0.144***
	(2.62)	(1.94)	(2.52)	(0.98)	(0.65)	(1.44)	(3.81)
Log Assets	−0.216***	−0.149***	−0.104***	−0.079***	−0.083***	−0.063**	−0.096***
	(−10.97)	(−5.84)	(−4.43)	(−3.73)	(−4.05)	(−2.57)	(10.64)
Leverage	0.001	−0.091	−0.232**	−0.183*	0.050	−0.287**	−0.142***
	(0.01)	(−0.81)	(−2.36)	(−1.66)	(0.38)	(−2.35)	(−2.87)
ROA	0.060	0.027	0.055*	−0.030	−0.008	0.158	0.014
	(1.45)	(0.80)	(1.66)	(−0.99)	(−0.82)	(1.21)	(0.92)
Investments-to-Assets	0.038	0.005*	0.049**	0.277*	0.006	0.250	0.011
	(0.93)	(1.89)	(2.37)	(1.66)	(0.02)	(1.30)	(1.21)
Liquidity	−0.001	0.002	0.005	0.007	0.015***	0.003	0.005***
	(−0.34)	(0.32)	(1.01)	(1.08)	(3.66)	(0.82)	(2.93)
Sales Growth	0.005	−0.009	0.001	0.021*	0.002	0.011	0.002
	(1.03)	(−1.62)	(0.13)	(1.73)	(1.00)	(0.50)	(0.91)
Dividend distributed	−0.024	−0.001	0.037	0.063	0.192**	0.144**	0.055**
	(−0.58)	(−0.02)	(0.78)	(0.95)	(2.52)	(2.12)	(2.21)
Offer value %	0.424***	0.184	0.213*	0.219	0.308*	0.191	0.208***
	(4.55)	(1.54)	(1.70)	(1.62)	(1.84)	(1.12)	(3.22)
IB Involvement	−0.057	−0.030	0.012	−0.028	−0.023	−0.017	−0.032
	(−1.19)	(−0.78)	(0.33)	(−0.53)	(−0.44)	(−0.24)	(−1.55)
Nasdaq MM	−0.064	−0.019	−0.041	−0.059	−0.022	0.085	−0.033
	(−1.31)	(−0.29)	(−0.66)	(−0.72)	(−0.23)	(0.81)	(−1.09)
Lagged market return	0.180	−0.623	−0.699	−1.096**	0.051	−0.201	−0.394***
	(0.47)	(−1.45)	(−1.62)	(−2.01)	(0.09)	(−0.43)	(−2.16)
Log Pre-Money	0.220***	0.122***	0.082***	0.073***	0.031	0.010	0.077***
	(9.00)	(4.54)	(3.04)	(2.77)	(0.87)	(0.37)	(6.67)
IPO-Year & Ind. contr.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event Year contr.	-	-	-	-	-	-	Yes
Adjusted R^2	0.410	0.322	0.308	0.219	0.254	0.180	0.245
Observations	305	305	304	297	271	226	1,708

This table presents three-stage IV regressions by event year and combined for all firm-years. The estimation period is 2010–2019. The dependent variable is the inverse of a proxy of Tobin's Q, where Q is book value of assets minus book value of equity plus market value of equity divided by book value of assets. DCL fitted values are the predicted linear probabilities from the second-stage regression. Log Assets is the log of total assets. Leverage is interest-bearing debt divided by total assets. ROA is EBITDA divided by total assets. Investments-to-Assets is capex plus R&D spend, divided by total assets. Liquidity is current assets divided by current liabilities. Sales Growth represents CAGR over the preceding 2 years. Dividend distributed is a dummy indicating if the firm distributed dividends that year. Offer value % is the ratio of total shares offered divided by total shares outstanding after the offering. IB Involvement a dummy indicating if an investment bank facilitated the offering. Nasdaq MM is a dummy indicating if the firm went public on the main market of Nasdaq Stockholm. Log Pre-Money is the log of total shares outstanding before the offering times the CPI-adjusted offer price. Lagged market return is the daily compounded return on OMX Small Cap PI index over the 22 trading days preceding the IPO. The regressions include Industry and IPO Year dummies. Parentheses enclose t-statistics adjusted for heteroskedasticity, and clusters for the combined model, while ***, **, and * denote significant difference from zero at 1, 5, and 10 %, respectively.

5.3 First-difference Estimates

To investigate the effect of the dual-class equity structure over the entire time period, we conduct a first-difference regression between year 0 (the IPO year) and year 5. We use the first-differentiated transformations, ΔLog Q and $\Delta - 1/Q$, as the dependent variables measuring changes in firm valuation. Our main independent variable is the fitted values for dual-class listings from the second-stage regression. This is a time-invariant variable that is kept in the model through an interaction with an event-year-5-dummy ($D\hat{C}L \cdot d_5$). Hence, the corresponding coefficient represents the time-varying effects of a dual-class listing on firm value. We include all previously applied controls but are only left with the time-sensitive variables measured each year-end.

Table 5.6 presents our first-difference estimates. We observe that a DCL is associated with a decrease in the change in Log Q at 5% significance. For Inverse Q, we find a similar negative association, but with a smaller magnitude, and significance at the 10% level. These results imply that, over time, the presence of dual-class equity structures tends to negatively influence the rate of change in Q. In other words, compared to single-class firms, dual-class firms demonstrate a relative decline in valuation over time. This aligns with our results from Table 5.4 and 5.5, where the magnitude and significance of the coefficients appeared to diminish for each passing year. However, the results from Table 5.6 indicate a clear impact of dual-class equity over time, lending further robustness to this result across several estimation methods. Other explanatory variables mirror the observed impacts on Q from the three-stage procedure.

Table 5.6: First-difference Regression on the effect of DCL over time

	Dependent variable:	
	ΔLog Q	$\Delta - 1/Q$
DCL fitted values	-0.375^{**}	-0.129^{*}
	(-2.34)	(-1.74)
Change in Log Assets	-0.321^{***}	-0.102^{***}
	(9.72)	(5.77)
Change in Leverage	-0.280	0.065
	(1.38)	(0.35)
Change in ROA	0.031	-0.062
	(0.31)	(0.77)
Change in Investments-to-Assets	0.380^{***}	0.067^{*}
	(4.77)	(1.92)
Change in Liquidity	0.014	0.006
	(1.51)	(1.64)
Change in Sales Growth	0.057^{***}	0.012^{*}
	(3.88)	(1.84)
Change in Dividend distributed	0.224^{***}	0.116^{***}
	(3.36)	(3.51)
Constant	0.343^{***}	0.065
	(5.18)	(1.60)
Adjusted R^2	0.190	0.077
Observations	226	226

This table presents first-difference results between event year 0 and 5. The estimation period is 2010-2019. The dependent variables are changes in log and inverse of a proxy of Tobin's Q, where Q is book value of assets minus book value of equity plus market value of equity divided by book value of assets. DCL fitted values are the predicted linear probabilities from the second-stage regression, kept in the regression through an interaction term with an event-year-5-dummy. Log Assets is the log of total assets. Leverage is interest-bearing debt divided by total assets. ROA is EBITDA divided by total assets. Investments-to-Assets is capex plus R&D spend, divided by total assets. Liquidity is current assets divided by current liabilities. Sales Growth represents CAGR over the preceding 2 years. Dividend distributed is a dummy indicating if the firm distributed dividends that year. Parentheses enclose t-statistics adjusted for heteroskedasticity, while ***, **, and * denote significant difference from zero at 1, 5, and 10 %, respectively.

6 Discussion

This section discusses the findings of our thesis. We begin by discussing our results in light of the hypotheses put forward in Section 2.6, before expanding our discussion to consider the broader implications of our study and its contributions to the existing body of research. Lastly, we reflect upon the limitations of our thesis.

6.1 Discussion of Hypotheses

Hypothesis 1: *For the first 5 years after the IPO dual-class firms are valuated at a premium compared to single-class firms.*

While our initial single-stage OLS estimated negative but insignificant effects of dual-class listing on firm valuation, our three-stage IV estimation accounting for endogeneity revealed a positive and significant impact for the first three years following the IPO, presented in Table 5.4 and 5.5. These observations were also reflected in the combined model, which pooled data across all firm-years. Consequently, our results partially align with Hypothesis 1 within the Swedish context. While we observe a significant positive effect of dual-class equity on firm valuation in the initial years (year $0 -$ year 2), a consistently positive and significant impact across all years remains unestablished.

Hypothesis 2: *The relative valuation of dual-class firms compared to single-class firms decreases over time.*

Taking a more explicit focus on the time dimension, the findings presented in Table 5.4 and 5.4 illustrate a consistent diminishing trend in both the magnitude and the statistical significance of dual-class equity on firm valuation. This is evident with insignificant estimates for the coefficient in the third to fifth event year. Moreover, the first-difference estimates in Table 5.6 underscore a significant and negative effect of the dual-class equity structure on changes in Q over time. These findings emphasize that, in comparison with single-class firms, dual-class firms exhibit a relative decline in valuation over time. Therefore, our findings within the Swedish context align with Hypothesis 2.

6.2 Implications of Results

While we find evidence of initial positive effects of dual-class equity on firm valuation that diminishes over time, it is important to note that these findings do not allow us to make definitive conclusions about the underlying drivers of these effects. Nevertheless, by drawing upon our theoretical conceptualization outlined in Equation 2.1, we can infer some implications on the relationship between the levers. This enables us to make well-informed speculations about the plausible drivers and underlying reasons behind our results, and insights that could provide a solid foundation for potential future research.

Interpreted through Equation 2.1, our results suggest that initially, benefits outweigh costs, but over time, agency costs increase relative to benefits. However, we cannot conclude whether this is due to diminishing benefits of retaining control, rising agency costs, or a combination of both. Bergström and Rydqvist (1990) and Holmen and Knopf (2004) found no evidence of shareholder expropriation in Sweden, leading us to spectate that the decreasing premium of dual-class equity relative to single-class could be driven by decreasing ΔQ_{LV}, rather than a significant increase in ΔQ_{Agency}. We base this on the argumentation that the value of a founder's vision and leadership skills may diminish over time, particularly as the initial vision becomes realized or as the firm expands beyond a scale that aligns with the founder's management style (Gurrea-Martínez, 2021). However, while we speculate that decreasing benefits might be the primary driver, this does not preclude the possibility of concurrently rising agency costs in Sweden.

Cremers et al. (2018) finds evidence of a negative long-term impact of dual-class equity that is the result of an increasing gap between voting and economic stakes as firms age, bringing along increased agency costs. We concur that this phenomenon probably exists in Sweden as well. As Smart et al. (2008) points out, insiders in both single-class and dual-class companies usually possess a substantial share of the equity at the IPO. However, in single-class firms, insiders' voting power decreases proportionally with their economic interests as they raise additional capital. In contrast, dual-class firms experience a less pronounced decline in insiders' voting rights relative to their economic ownership. This leads to a widening discrepancy between economic incentives and voting power in dual-class firms over time, potentially increasing agency costs. Our findings do concur with this perspective, indicating that investors start discounting dual-class equity from the IPO. However, as highlighted by Lidman and Skog (2022) Sweden is known for its strong minority protections. Dyck and Zingales (2004) also points out that better legal protection of minorities and higher tax compliance reduce private benefits of control, and Sweden is one of the strongest, most stable, and high-compliance tax states in the world (Nistotskaya & D'Arcy, 2018). Dual-class equity is also perceived as a valuable feature of the Swedish stock market according to Confederation of Swedish Enterprise (2023) Therefore, although contrary to some prevailing literature, we posit that the agency costs associated with dual-class equity structure in Sweden may not have as detrimental an impact as suggested elsewhere, and might not be the most significant factor affecting the outcomes of our study. While not the primary driver, we still believe agency costs to increase as firms age in Sweden, therefore the most plausible implication of our study is that the levers are simultaneously converging.

Another important aspect of our thesis is that our sample significantly differs from those examined in the existing literature. Previous research on the field often focuses on larger and more volatile markets, or at least on firms listed on a country's main exchange. On the other hand, our analysis predominantly includes firms listed on junior markets, which are usually subject to loser requirements and low initial potential for expropriation of minority shareholders. Yet, it's also plausible that for firms in our sample, which are generally at an earlier stage in their corporate life-cycle, the benefits of dual-class structures more generally outweigh the potential agency costs, which first become more pronounced as firms mature. This view is supported by Hossain and Kryzanowski (2019) who argues that dual-class equity may be a better option for some firms at IPO and in the rapid growth stage of their life cycle. This suggests that the observed valuation premium, and implicit and relative favor towards of benefits in Equation 2.2, might not solely be attributed to the Swedish regulatory context, but could also be a reflection of the advantages and benefits of dual-class structures for young growth companies.

Our first main result of the positive effect on firm valuation is in line with the findings of Cremers et al. (2018), Kim and Michaely (2019), and von der Crone and Plaksen (2010), who attribute their results to the presence of higher benefits and lower agency costs associated with dual-class share structures in the short-term. Our second main result finding, that the valuation premium for dual-class firms diminishes over time, mirrors the findings of Bebchuk and Kastiel (2017), Cremers et al. (2018), and Kim and Michaely (2019). Consequently, our research contributes to the existing body of research by finding similar evidence, but in a different context and with a distinct sample. By both validating established findings and introducing new perspectives our research enriches the academic understanding of dual-class equity. Since we cannot draw definitive conclusions about the underlying levers, this remains a subject for further research. In this regard, examining the impact of dual-class structures on more specific factors like innovation or managerial compensation could yield deeper insights into the levers that affect dual-class firm value in the context of the Swedish market. Furthermore, additional studies should aim to explore factors influencing firm value beyond the scope of our conceptualization and assumptions. Exploring differences in operating performance and share price performance between dual-class and single-class firms could shed light on other underlying factors that affect valuations.

Lastly, while our findings suggest a positive effect of dual-class equity on firm valuation, this does not imply that dual-class structures are beneficial in all contexts. It is crucial to recognize the risks and limitations associated with this type of governance structure. Consequently, we believe our findings should be interpreted as an indication that, under appropriate regulations and transparent corporate governance practices, the potential benefits of dual-class equity could be reaped, or at least, effectively balance out the associated costs and drawbacks.

6.3 Limitations

Our research, though offering valuable insights, comes with limitations that need to be acknowledged. Firstly, one such limitation is the relatively small sample size, which could be seen as a constraint when deducting broader implications. Our smaller sample compared to the central U.S. studies, is a reflection of not only the comparatively smaller Swedish market but also of the specific time period we have chosen for our analysis. While expanding our time period to encompass the pre-financial crisis would have increased its size, we concluded that this extension would likely introduce more confounding variables than useful data.

Secondly, the data collection process involved substantial manual effort, which, despite being thorough, is prone to human error. Particularly, when encountering instances of incomplete information, often related to the IPO or identifying founders and their stakes, we had to make some simplifications and assumptions.

Lastly, the most significant limitation of our thesis lies in the validity of our instrumental variables. The validity of instruments is based on strict conditions as discussed in Section 4.3.5, and good instruments are notoriously difficult to find (Angrist & Pischke, 2009, p. 165). Since we cannot formally test for exogeneity in instruments, we must rely on economic reasoning to justify their usage. Despite this approach being well-reasoned, it does not provide an absolute guarantee that the instrument satisfies both conditions. Nevertheless, our choice of instruments is based on research published in peer-reviewed and recognized economic journals, such as Gompers et al. (2010), Masulis et al. (2009), and Smart et al. (2008). These studies are among the most cited articles within the field of research on the effects of dual-class structures, and while their authors acknowledge the challenges in obtaining valid instruments, their methodology is frequently cited and replicated. In this thesis, we employ instruments and methodologies that align with existing research but apply them to a different time period, market context, and distinct sample of firms. Hence, despite concerns regarding the absolute validity of our instruments, our results should be comparable to those in the existing literature. Accordingly, regardless of these potential limitations in the validity of instruments, we assess our research contributes to the existing literature and provides insights relevant to the current debate in the field.

7 Conclusion

In this thesis, we construct and analyze a data set of 305 firms that went public in Sweden between 2010 and 2019. After correcting for endogeneity, we find evidence that going public with dual-class equity results in an initial valuation premium over single-class firms. This valuation premium persists for at least five years but is only significant for the first three years following the IPO. Additionally, the observed premium diminishes over time.

We account for the potential endogeneity in the decision to go public with dual-class equity by applying a three-stage instrumental variables estimation, using the hypothesized determinants of dual-class listings as instruments. Additionally, we also conduct a first-difference regression to address the overall effect of the time-varying impact of our time-indifferent independent variable. Compared to the results of our single-stage OLS, endogeneity seems to bias our results towards a negative impact, underscoring the importance of properly accounting for endogeneity.

Our findings contribute to the existing literature on the effect of dual-class structures by providing evidence from the under-explored Swedish market. Concentrating on Sweden offers unique insight into the impact of dual-class stock on market dynamics and valuation, providing a perspective distinct from the frequently studied markets. Moreover, our research offers a new angle by including younger firms at earlier stages of their corporate life-cycle, which differs from the typical samples in the existing literature. Nevertheless, our results align with and enrich the understanding of dual-class equity structures, and are comparable to previous studies in the field. This adds to the credibility of our thesis and suggests that the patterns we observe in the Swedish market may have broader applicability.

While we find evidence of positive effects on firm valuation, we are not able to draw a direct conclusion on the levers moving this effect. While our results imply that the benefits of dual-class structures outweigh the costs in the short term, we cannot conclude which effect is more dominant. The same goes for the observed relative difference between the benefits and costs over time. Hence, the temporal shift in the cost-benefit equilibrium of dual-class equity in the Swedish market poses an interesting subject for further research.

This thesis initiated by outlining the ongoing debate about dual-class share structures globally. Historically, the drawbacks of dual-class equity have been the dominating narrative. However, along with more recent research, a more nuanced understanding is emerging. Our research adds to this perspective by recognizing the potential benefits of dual-class equity and the intricate balance between its advantages and disadvantages. This could suggest that, at least under certain conditions, the 'one share, one vote' principle might not be the only effective governance structure.

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Appendices

A Sample and Variable lists

A.1 Final Sample

Table A.1: Final Sample list

Name	IPO.Date	Exchange	DCL
24SevenOffice Group AB	2017-12-21	Spotlight	No
2cureX AB	2017-11-24	Nasdaq FN	No
Absolent Air Care Group AB	2014-10-16	Nasdaq FN	No
Absolicon Solar Collector AB	2016-06-22	Spotlight	No
Acarix AB	2016-12-19	Nasdaq FN	No
Acconeer AB	2017-12-11	Nasdaq FN	No
AcouSort AB	2017-01-09	Spotlight	No
Actic Group AB	2017-04-07	Nasdaq MM	No
AcuCort AB	2017-04-24	Spotlight	No
Acuvi AB	2016-06-09	Nasdaq FN	No
Advenica AB	2014-09-18	Nasdaq FN	No
Adverty publ AB	2018-11-29	NGM	No
Aerowash AB	2017-02-17	Spotlight	Yes
Agtira AB	2017-06-27	NGM	Yes
Aino Health AB	2016-12-16	Nasdaq FN	No
Aixia Group AB	2018-01-09	Spotlight	Yes
Alimak Group AB	2015-06-17	Nasdaq MM	No
Alligator Bioscience AB	2016-11-23	Nasdaq MM	No
AlzeCure Pharma AB	2018-11-28	Nasdaq FN	No
Ambea AB	2017-03-31	Nasdaq MM	No
Anima Group AB	2019-07-17	NGM	Yes
AppSpotr AB	2016-12-19	Spotlight	No
Arcoma AB	2014-11-14	Nasdaq FN	No

Continued on next page

Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
AroCell AB	2011-05-25	Spotlight	No
Asarina Pharma AB	2018-09-24	Nasdaq FN	No
Ascelia Pharma AB	2019-03-13	Nasdaq MM	No
Attana AB	2018-03-07	NGM	No
Attendo AB	2015-11-30	Nasdaq MM	No
Avtech Sweden AB	2012-02-20	Nasdaq FN	Yes
Awardit AB publ	2017-12-05	Nasdaq FN	No
Ayima Group AB	2017-05-29	Spotlight	Yes
B3 Consulting Group AB	2016-06-13	Nasdaq FN	No
Bactiguard Holding AB	2014-06-19	Nasdaq MM	Yes
Balco Group AB	2017-10-06	Nasdaq MM	No
Bambuser AB	2017-05-05	Nasdaq FN	No
Besqab AB	2014-06-12	Nasdaq MM	No
Beyond Frames Entertainment AB	2018-12-06	Spotlight	No
BHG Group AB	2018-03-27	Nasdaq MM	No
BiBBInstruments AB	2017-10-27	Spotlight	No
BICO Group AB	2016-11-03	Nasdaq FN	Yes
BioArctic AB	2017-10-12	Nasdaq MM	Yes
Bioservo Technologies AB	2017-05-22	Nasdaq FN	No
Biovica International AB	2017-03-29	Nasdaq FN	Yes
Bio-Works Technologies AB	2017-12-14	Nasdaq FN	No
Blick Global Group AB	2014-06-25	Spotlight	No
BONESUPPORT HOLDING AB	2017-06-21	Nasdaq MM	No
Bonzun AB	2014-10-02	Nasdaq FN	No
Boozt AB	2017-05-31	Nasdaq MM	No
Boule Diagnostics AB	2011-06-23	Nasdaq MM	No
Bravida Holding AB	2015-10-16	Nasdaq MM	No
Briox AB	2011-09-12	NGM	No
Bufab AB	2014-02-21	Nasdaq MM	No
Bulten AB	2011-05-20	Nasdaq MM	No

Continued on next page

Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Byggmax Group AB	2010-06-02	Nasdaq MM	No
CAG Group AB	2018-12-12	Nasdaq FN	No
Calliditas Therapeutics AB	2018-06-29	Nasdaq MM	No
Camurus AB	2015-12-03	Nasdaq MM	No
Cardeon AB	2018-04-13	NGM	Yes
Chordate Medical Holding AB	2017-03-08	NGM	No
Christian Berner Tech Trade AB	2014-10-20	Nasdaq FN	Yes
Clemondo Group AB	2013-12-19	Nasdaq FN	No
Climeon AB	2017-10-13	Nasdaq FN	Yes
Coor Service Management Holding AB	2015-06-16	Nasdaq MM	No
Corline BioMedical AB	2015-06-03	Nasdaq FN	No
Crunchfish AB	2016-11-11	Nasdaq FN	No
Cyber Security 1 AB	2016-09-22	Nasdaq FN	No
DevPort AB	2017-12-07	Nasdaq FN	Yes
DexTech Medical AB	2014-06-19	Spotlight	No
Divio Technologies AB	2019-12-18	Nasdaq FN	Yes
Dometic Group AB	2015-11-25	Nasdaq MM	No
Double Bond Pharmaceutical Int. AB	2015-07-10	Spotlight	Yes
Dustin Group AB	2015-02-13	Nasdaq MM	No
Ecoclime Group AB	2014-02-18	Spotlight	No
Ecomb AB	2011-02-02	Spotlight	Yes
Eltel AB	2015-02-06	Nasdaq MM	No
Embracer Group AB	2016-11-22	Nasdaq FN	Yes
Enad Global 7 AB	2017-12-13	NGM	No
Enorama Pharma AB	2016-06-10	Nasdaq FN	No
Enzymatica AB	2011-06-14	Spotlight	No
Episurf Medical AB	2010-11-05	Spotlight	Yes
Evolution AB	2015-03-20	Nasdaq FN	No
ExpreS2ion Biotech Holding AB	2016-07-29	Nasdaq FN	No
Eyeonid Group AB	2016-09-20	NGM	No

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Fastighets AB Trianon	2017-06-21	Nasdaq FN	Yes
FlexQube AB	2017-12-14	Nasdaq FN	No
Flowscape Technology AB	2016-08-02	Spotlight	No
Fluicell AB	2018-04-18	Nasdaq FN	No
FM Mattsson AB	2017-04-10	Nasdaq MM	Yes
Fram Skandinavien AB	2017-10-12	Nasdaq FN	Yes
Freja eID Group AB	2014-12-18	Nasdaq FN	No
Future Gaming Group International AB	2012-07-23	Spotlight	No
Gaming Corps AB	2015-06-04	Nasdaq FN	No
GARO AB	2016-03-16	Nasdaq MM	No
Gasporox AB	2016-10-25	Nasdaq FN	No
Gold Town Games AB	2016-07-13	NGM	No
GomSpace Group AB	2016-06-16	Nasdaq FN	No
Granges AB	2014-10-10	Nasdaq MM	No
Greater Than AB	2014-06-12	Spotlight	No
Green Landscaping Group AB	2018-03-23	Nasdaq FN	No
Gullberg & Jansson AB	2012-06-19	Spotlight	No
Hanza AB	2014-06-19	Nasdaq FN	No
Hitech & Development Wireless Sweden AB	2017-12-22	Nasdaq FN	Yes
Hoodin AB	2018-11-07	Spotlight	No
Hoylu AB	2017-02-20	Nasdaq FN	No
Hubso Group AB	2018-01-03	Spotlight	No
Humana AB	2016-03-22	Nasdaq MM	No
Iconovo AB	2018-04-06	Nasdaq FN	No
Imint Image Intelligence AB	2015-12-16	Spotlight	No
Immunovia AB	2015-12-01	Nasdaq FN	No
Implementa Sol AB	2015-12-16	NGM	Yes
InCoax Networks AB	2019-01-03	Nasdaq FN	No
InDex Pharmaceuticals Holding AB	2016-10-11	Nasdaq FN	No
Infracom Group AB	2018-01-15	Spotlight	No

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Infrea AB	2018-04-20	Nasdaq FN	No
Inhalation Sciences Sweden AB	2017-09-28	Spotlight	No
Inission AB	2015-06-10	Nasdaq FN	Yes
Insplorion AB	2015-06-25	Spotlight	No
Instalco AB	2017-05-11	Nasdaq MM	No
Integrum AB	2017-05-15	Nasdaq FN	Yes
Invent Medic Sweden AB	2016-02-29	Spotlight	No
Inwido AB	2014-09-26	Nasdaq MM	No
Irisity AB	2013-10-23	Nasdaq FN	No
IRLAB Therapeutics AB	2017-02-28	Nasdaq FN	No
Isofol Medical AB	2017-04-04	Nasdaq FN	No
I-Tech AB	2018-05-28	Nasdaq FN	No
iZafe Group AB	2011-04-04	Spotlight	Yes
Jetpak Top Holding AB	2018-12-05	Nasdaq FN	No
John Mattson Fastighetsforetagen publ AB	2019-06-05	Nasdaq MM	No
Jondetech Sensors AB	2018-05-25	Nasdaq FN	No
Jumpgate AB	2016-09-16	NGM	No
Kancera AB	2011-02-25	Nasdaq FN	No
Karnov Group AB	2019-04-11	Nasdaq MM	No
Karolinska Development AB	2011-04-15	Nasdaq MM	Yes
Kentima Holding AB	2013-06-19	Nasdaq FN	Yes
K-Fast Holding AB	2019-11-29	Nasdaq MM	Yes
Kollect on Demand Holding AB	2019-12-19	Nasdaq FN	No
Kontigo Care AB	2015-06-23	Nasdaq FN	No
Lime Technologies AB	2018-12-06	Nasdaq MM	No
Litium AB	2016-05-31	Spotlight	No
Lyko Group AB	2017-12-12	Nasdaq FN	No
Mackmyra Svensk Whisky AB	2011-12-16	Nasdaq FN	Yes
MAG Interactive AB	2017-12-08	Nasdaq FN	No
Maximum Entertainment AB	2018-11-23	NGM	Yes

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Medclair Invest AB	2017-03-03	NGM	No
Medfield Diagnostics AB	2012-05-02	Spotlight	No
Medicover AB	2017-05-23	Nasdaq MM	Yes
Mendus AB	2013-04-22	Nasdaq FN	No
Mentice AB	2019-06-18	Nasdaq FN	No
Metacon AB	2018-10-11	NGM	No
Midsummer AB	2018-06-21	Nasdaq FN	No
MIPS AB	2017-03-23	Nasdaq MM	No
Moba Network AB	2019-12-12	Nasdaq FN	No
Moberg Pharma AB	2011-05-26	Nasdaq MM	No
Munters Group AB	2017-05-19	Nasdaq MM	No
MyFirstApp Sweden AB	2018-01-04	Spotlight	No
Nanexa AB	2015-06-17	Spotlight	No
Nanologica AB	2015-10-30	Spotlight	No
NCAB Group AB	2018-06-05	Nasdaq MM	No
Nepa AB	2016-04-26	Nasdaq FN	No
News55 AB	2017-07-21	NGM	No
Nilsson Special Vehicles AB	2015-12-11	Nasdaq FN	No
Northbaze Group AB	2010-05-18	Spotlight	No
NOSIUM AB	2018-02-02	NGM	Yes
NP3 Fastigheter AB	2014-12-04	Nasdaq MM	No
OmniCar Holding AB	2017-07-13	Spotlight	No
Oncopeptides AB	2017-02-22	Nasdaq MM	No
OptiCept Technologies AB	2014-06-19	Spotlight	No
OrganoClick AB	2015-02-16	Nasdaq FN	No
OssDsign AB	2019-05-24	Nasdaq FN	No
Ovzon AB	2018-05-18	Nasdaq FN	No
Oxe Marine AB	2017-07-04	Nasdaq FN	No
Paradox Interactive AB	2016-05-31	Nasdaq FN	No
Paxman AB	2017-06-12	Nasdaq FN	No

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Peptonic Medical AB	2014-07-02	Spotlight	No
Pharmacolog I Uppsala AB	2015-06-08	Spotlight	No
Phase Holographic Imaging PHI AB	2014-01-20	Spotlight	No
Platzer Fastigheter Holding AB	2013-11-29	Nasdaq MM	Yes
Plejd AB	2016-04-11	Spotlight	No
Prebona AB	2015-12-17	Spotlight	No
Premium Snacks Nordic AB	2014-12-01	Spotlight	No
Projektengagemang Sweden AB	2018-06-19	Nasdaq MM	Yes
ProstaLund AB	2013-10-24	Spotlight	No
Q linea AB	2018-12-07	Nasdaq MM	No
Qiiwi Games AB	2017-10-13	Spotlight	No
Qleanair AB	2019-12-12	Nasdaq FN	No
Ranplan Group AB	2018-06-28	Nasdaq FN	No
Raytelligence AB	2018-12-20	NGM	No
Real Fastigheter AB	2016-04-21	NGM	Yes
Realfiction Holding AB	2017-07-14	Nasdaq FN	No
Redwood Pharma AB	2016-06-15	Spotlight	No
Respiratorius AB	2012-07-05	Spotlight	No
S2Medical AB	2018-11-28	Nasdaq FN	Yes
Safe Lane Gaming AB	2010-07-07	Spotlight	Yes
Safeture AB	2014-10-15	Nasdaq FN	No
Samtrygg Group AB	2017-03-15	NGM	Yes
Saniona AB	2014-04-22	Spotlight	No
Sarsys AB	2017-03-02	NGM	No
Scandbook Holding AB	2010-03-31	Nasdaq FN	No
Scandi Standard AB	2014-06-27	Nasdaq MM	No
Scandic Hotels Group AB	2015-12-02	Nasdaq MM	No
ScandiDos AB	2014-04-11	Nasdaq FN	No
Scandinavian ChemoTech AB	2016-12-06	Nasdaq FN	Yes
Scandinavian Enviro Systems AB	2014-06-18	Nasdaq FN	No

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Scandinavian Real Heart AB	2014-11-26	Spotlight	No
SciBase Holding AB	2015-06-02	Nasdaq FN	No
Scout Gaming Group AB	2017-12-11	Nasdaq FN	No
SeaTwirl AB	2016-12-22	Nasdaq FN	No
SECITS Holding AB	2017-05-11	Nasdaq FN	No
Sedana Medical AB	2017-06-21	Nasdaq FN	No
SenzaGen AB	2017-09-21	Nasdaq FN	No
Serstech AB	2013-08-29	Spotlight	No
Simris Group AB	2016-04-22	Nasdaq FN	Yes
Sinch AB	2015-10-08	Nasdaq MM	No
Sivers Semiconductors AB	2011-05-30	NGM	No
Smart Eye AB	2016-12-07	Nasdaq FN	No
Smoltek Nanotech Holding AB	2018-02-26	Spotlight	No
Soltech Energy Sweden AB	2015-06-25	Nasdaq FN	No
Sprint Bioscience AB	2014-11-07	Nasdaq FN	No
Stillfront Group AB	2015-12-08	Nasdaq FN	No
Surgical Science Sweden AB	2017-06-19	Nasdaq FN	No
Sustainable Energy Solutions Sweden Holding AB	2016-08-23	NGM	No
Swedencare AB	2016-06-14	Nasdaq FN	No
Swedish Stirling AB	2016-11-28	NGM	No
Swemet AB	2015-07-21	NGM	Yes
Sydsvenska Hem AB	2016-04-06	Spotlight	No
Syncro Group AB	2010-05-17	Spotlight	Yes
Tangiamo Touch Technology AB	2017-04-06	Nasdaq FN	No
TCECUR Sweden AB	2017-06-09	Nasdaq FN	No
Tempest Security AB	2017-12-06	Nasdaq FN	No
Terranet AB	2017-05-30	Nasdaq FN	Yes
Thule Group AB	2014-11-26	Nasdaq MM	No
Time People Group AB	2017-12-07	NGM	No
Tobii AB	2015-04-24	Nasdaq MM	No

Continued on next page

Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Topright Nordic AB	2017-12-15	NGM	No
Touchtech AB	2017-11-22	Spotlight	No
Tourn International AB	2013-12-18	Spotlight	No
Transiro Holding AB	2016-12-13	NGM	No
Transtema Group AB	2015-05-21	Spotlight	No
Triboron International AB	2019-04-08	Nasdaq FN	Yes
Troax Group AB	2015-03-27	Nasdaq MM	No
Umida Group AB	2011-01-31	Spotlight	Yes
Unibap AB	2017-03-27	Nasdaq FN	No
Upsales Technology AB	2019-04-24	Nasdaq FN	No
Urb-it AB	2017-07-07	Nasdaq FN	No
Vadsbo SwitchTech Group AB	2016-05-03	Spotlight	No
Vertiseit AB	2019-05-28	Nasdaq FN	Yes
VibroSense Dynamics AB	2015-05-04	Spotlight	Yes
Vicore Pharma Holding AB	2015-12-10	Nasdaq FN	No
VIMAB Group AB	2015-10-02	Nasdaq FN	No
Vo2 Cap Holding AB	2016-12-22	Nasdaq FN	No
Waystream Group AB	2015-11-12	Nasdaq FN	No
WilLak AB	2016-09-22	NGM	No
WntResearch AB	2010-12-17	Spotlight	No
Xbrane Biopharma AB	2016-02-03	Nasdaq FN	No
XMReality AB	2017-04-26	Nasdaq FN	No
XSpray Pharma AB	2017-09-28	Nasdaq FN	No
Zaplox AB	2017-06-08	Nasdaq FN	No
Zenergy AB	2015-12-07	Spotlight	No
ZignSec AB	2019-10-21	Nasdaq FN	No
24Storage AB	2019-12-10	Nasdaq FN	No
AdderaCare AB	2016-12-01	Nasdaq FN	No
Ahlsell AB	2016-10-28	Nasdaq MM	No
ArcAroma AB	2013-04-03	Spotlight	Yes

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Atvexa AB	2017-12-13	Nasdaq FN	Yes
Axkid AB	2014-07-01	Spotlight	No
Azelio AB	2018-12-10	Nasdaq FN	No
Brighter AB	2012-02-03	Spotlight	No
BuildData Group AB	2018-03-15	Nasdaq FN	No
Capio AB	2015-06-30	Nasdaq MM	No
Colabitoil Sweden AB	2017-12-12	Spotlight	No
Com Hem Holding AB	2014-06-17	Nasdaq MM	No
Curira AB	2017-05-10	NGM	Yes
Edgeware AB	2016-12-09	Nasdaq MM	No
FUUD AB	2019-03-27	Nasdaq FN	Yes
Get Group AB	2017-06-07	NGM	No
Global Gaming 555 AB	2017-10-19	Nasdaq FN	No
Group of Retail Assets Sweden AB	2015-06-15	Nasdaq FN	Yes
Handicare Group AB	2017-10-10	Nasdaq MM	No
Hemfosa Fastigheter AB	2014-03-21	Nasdaq MM	No
Hovding Sverige AB	2015-06-16	Nasdaq FN	No
Hubbr AB	2010-11-29	Spotlight	Yes
Internationella Engelska skolan i Sverige AB	2016-09-29	Nasdaq MM	No
IRRAS AB	2017-11-22	Nasdaq FN	No
LeoVegas AB	2016-03-17	Nasdaq FN	No
Lexington Company AB	2015-02-18	Nasdaq FN	No
Liv ihop AB	2018-02-23	Nasdaq FN	No
Magnolia Bostad AB	2015-06-09	Nasdaq FN	No
MaxFastigheter i Sverige AB	2016-06-29	Nasdaq FN	No
MoxieTech Group AB	2015-11-23	Nasdaq FN	No
MQ Holding AB	2010-06-18	Nasdaq MM	No
MultiDocker Cargo Handling AB	2017-01-12	NGM	No
Nobina AB	2015-06-18	Nasdaq MM	No
Nuevolution AB	2015-12-17	Nasdaq FN	No

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Table A.1 – continued from previous page

Name	IPO Date	Exchange	DCL?
Oboya Horticulture Industries AB	2014-11-14	Spotlight	Yes
Pallas Group AB	2010-07-07	Nasdaq FN	Yes
Recipharm AB	2014-04-03	Nasdaq MM	Yes
Sensec Holding AB	2017-06-22	NGM	No
Serneke Group AB	2016-11-24	Nasdaq MM	Yes
Sportamore AB	2012-10-25	Nasdaq FN	No
SSM Holding AB	2017-04-06	Nasdaq MM	No
TC TECH Sweden AB	2015-11-30	Nasdaq FN	No
Transcendent Group AB	2019-10-22	Nasdaq FN	No
VA Automotive i Hässleholm AB	2014-12-01	Nasdaq FN	No
Wilson Therapeutics AB	2016-05-12	Nasdaq MM	No
ZetaDisplay AB	2011-04-04	Nasdaq FN	No

A.2 Variable description

Table A.2: Ownership and IPO-related Variables and Their Descriptions

Variable	Description
DCL	Binary variable taking the value of 1 if the firm undertakes an IPO with a dual-class structure. A dual-class structure is assigned to all firms that went public with a capital structure consisting of more than one share class, with differential voting rights for at least one of the share classes. Our main independent variable intended to capture the treatment effect of a dual-class structures on firm valuation.
Founder control	The percentage of voting rights held by the firm's initial founder, or persons closely affiliated to the founder, at the time of the IPO. It assigns 0% if the founder is no longer involved, or the appropriate voting percentage in cases of differential voting. We include this to assess the founder's influence and perceived value in maintaining control.
VC Involvement	Binary variable indicating if the firm went public with a venture capital fund backing their finances prior to the IPO. Included to assess the role of venture capital firms in shaping governance structures.
Age	In cases of mergers, we use the founding date of the entity that represents the core business moving forward.
Offer value %	The size of the equity issuance related to the IPO, consisting of both primary and secondary issue. Calculated as the total number of shares offered times the CPI-adjusted offer price. Included to gauge the size of the IPO and investor interest.
IB Involvement	Binary variable indicating if the firm went public using an investment bank to facilitate their offering. We include this variable to assess the impact of IB usage to succeed with dual-class listings.
Pre-Money value	The value of the firm before the equity issuance related to the IPO. Calculated as the total number of shares pre-IPO times the CPI-adjusted offer price. Included to measure the firm's valuation before the IPO.
Nasdaq MM	A binary variable indicating if the firm went public on the Main Market of Nasdaq Stockholm. We include this to differentiate between firms listed on the main market and those on alternative markets.
Lagged market return	The compounded daily return for the preceding 22 trading days before the IPO. Calculated using the OMX Small Cap PI index. Included to capture market momentum that could potentially influence the IPO.
First-day Market Cap	Calculated as the number of shares post-offering multiplied by the CPI-adjusted closing price on the first trading day. We include it as a measure of the market's initial valuation of the firm.
IPO Year Indicator	A binary variable for every IPO year in our sample, except one. Included to control for variations in market conditions and the cyclical nature of IPO markets.

Table A.3: Accounting Variables and Their Descriptions

Variable	Description
Log Q & Inverse Q	These variables are transformations of our proxy for Tobin's Q, and our main dependent variables. Further details on the calculation and transformation of Tobin's Q are discussed in section 4.1.
Assets	This variable represents the firm's total assets as reported in their balance sheet. Included to allow our proxy for Tobin's Q to reflect firm valuation.
Leverage	This variable represents the ratio of the firm's interest-bearing debt to its total assets. Included as a measure of the firm's financial leverage and risk profile.
ROA	This variable represents the ratio of the firm's earnings before interest, taxes, depreciation, and amortization to its total assets. Included as a measure of the firm's operational efficiency and profitability.
Investments-to-Assets	This variable represents the ratio of the firm's current year's spending on capital expenditures and research & development to its total assets. Included as a measure of a company's commitment to future growth.
Liquidity	This variable represents the ratio of the firm's current assets to its liabilities, commonly referred to as the current ratio. Included as a measure of liquidity and operational efficiency.
Sales Growth	This variable reflects the compounded annual growth rate in sales over a two-year period. Sales Growth for year t represents the compounded annual growth rate of sales from $t-2$ to t, and for years 0 and 1, it equals the compounded annual growth rate from year 0 to 2. Included to measure the firm's growth trajectory.
Dividend distributed	A binary variable indicating whether the firm paid out dividends in the current year. Included as a measure of the firm's maturity and confidence in their ability to generate future earnings.
Industry Indicator	A binary variable for every industry in our sample, excluding one. Included to control for industry-specific variations affecting firm valuation.

B Additional Estimates

B.1 Second-Stage OLS Regression

Table B.1: Second-Stage OLS Regression using nonlinear fitted probabilities for DCL

	Dependent variable: DCL
	Probit Model 2
DCL fitted prob. [$\hat{\Phi}$]	1.011***
	(7.24)
Offer value %	−0.020
	(−0.14)
IB Involvement	−0.001
	(−0.01)
Nasdaq MM	0.016
	(0.21)
Lagged market return	0.072
	(0.18)
Log Pre-Money in mill.	−0.003
	(−0.16)
Observations	305
Adjusted R^2	0.351

This table presents the final results of a three-stage IV regression by event year. The estimation period is 2010–2019. The dependent variable is a dummy equal to one if the firm went public with dual-class equity. DCL fitted values are the predicted nonlinear probabilities from the first-stage probit regression [Φ]. Log Assets is the log of total assets. Leverage is interest-bearing debt divided by total assets. ROA is EBITDA divided by total assets. Investments-to-Assets is capex plus R&D spend, divided by total assets. Liquidity is current assets divided by current liabilities. Sales Growth represents CAGR over the preceding 2 years. Dividend distributed is a dummy indicating if the firm distributed dividends that year. Offer value % is ratio of total shares offered divided by total shares outstanding after the offering, both times the CPI-adjusted offer price. IB Involvement is an indicator variable equal to one if an investment bank facilitated the offering. Nasdaq MM is a dummy equal to one if the firm went public on the main market of Nasdaq Stockholm. Log Pre-Money is the logarithm of total shares outstanding before the offering times the CPI-adjusted offer price. Lagged market return is the daily compounded return on OMX Small Cap PI index over the 22 trading days preceding the IPO. The regressions include Industry and IPO Year dummies. Respectively, ***, **, and * denote significant difference from zero at 1, 5, and 10 percent. Parentheses enclose t-statistics adjusted for heteroskedasticity.