The Changing Relevance of Dual-Class Shares in Europe:

A Corporate Governance and Performance Perspective

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Abstract

Dual-class shares split the ownership and control rights of a firm in such a way that some investors receive superior voting power. They typically grant ten votes per share and usually provide the owner with the vote majority despite having only a minority equity stake. Many countries allowed different dual-class share structures for decades. Regulators and institutional investors always viewed them critically and recommended to adhere to the "one-share-one-vote" principle. More recently, many entrepreneurial firms employ them when going public in the U.S. and Asia. In Europe, we observe a drastic decline of firms with multiple-voting shares in the Nordic countries, a rise in loyalty shares in Southern European countries, and decline of preference shares in Germany. In this study, we examine the financial and operational performance of firms with dual-class shares for 13 European capital markets from 1994 to 2020. The focus is on the costs and benefits of disproportional ownership and voting arrangements and on differences between single- and dual-class firms. We find that IPOs with dual-class shares are relatively lower valued compared to single-class firms, but they are more profitable. There is no general valuation discount, although regional and country differences exist. The ownership structure, life cycle effects, operational efficiency and agency problems of dual-class firms are important factors leading to specific valuation and performance effects in some countries. Currently, most stock exchanges around the world allow dual-class shares, especially to attract unicorns and to stay competitive. Germany remains the only European country prohibiting shares with multiple voting rights.

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*"The **advantage** of a dual-class share structure is that it protects entrepreneurial management from the demands of shareholders.*

*The **disadvantage** of a dual-class share structure is that it protects entrepreneurial management from the demands of shareholders."*

(Andrew Hill, Financial Times)

1. Introduction

During the last two decades, financial systems in general and the financing and investment behavior in particular experienced dramatic changes in many countries. These changes had significant effects on ownership structure and governance of publicly traded companies in the U.S. as well as in Europe. The introduction of the Euro as a common currency resulted in a higher capital market integration and an increase in cross-border financing and investment activities in Europe, whereas the Global Financial Crisis (2007-2009) and the European Sovereign Debt Crisis (2011-2012) negatively affected these developments. Moreover, the number of publicly traded companies has continuously declined in the U.S. since 1997 (Doidge et al., 2017; Lattanzio et al., 2022; Eckbo and Lithell, 2022) and in some European countries since 2007 (Ritter et al., 2013; Bessler et al., 2021, 2022). In contrast, we observed increasing numbers of IPOs in Asian countries and especially in China (Karolyi and Kim, 2017). All these changes affected not only the capital market structures and the corporate governance systems in the U.S., Europe and Asia, but most importantly, the competition between these financial systems and exchanges for keeping innovative high-tech companies listed in the home country, and for attracting IPOs and especially unicorns to list at domestic securities markets.

This competition and these governance changes resulted in some complex constructions for separating cash flow (ownership) and voting rights (control) by creating shares with different voting structures. These **dual-class shares** offer either **multiple voting rights** (up to 10 or 20) to some investors, and only one vote or none to others, or they may grant two votes to "loyal" shareholders after a two-year continuous holding period (**loyalty shares**), and only one vote to the other apparently short-term oriented investors. Moreover, specific types of dual-class shares grant some shareholders one vote and others no vote at all, as they abandon their voting rights for obtaining other preferential benefits such as higher dividends (**non-voting preference shares**). Consequently, it is important to understand the economic benefits and costs of different systems when separating ownership and control rights, and especially different voting structures. This is a pivotal issue, as it has become a means of competition between stock ex-

changes to convince founders, inventors or entrepreneurs to list their start-up firms and especially unicorns on their trading venue. Interestingly, we observe different trends in dual-class shares in the U.S. and Europe during the last two decades.

In the U.S., dual-class shares in the form of shares with multiple voting rights gained momentum[1] in recent years (Aggarwal et al., 2022; Lel et al., 2021; Kim and Michaely, 2019; Cremers et al., 2020), whereas the number of dual-class firms, also as shares with multiple voting rights, consistently declined in some European countries.[2] Germany even banned shares with multiple voting rights since 1998. It still permits two shares classes in a company, one with one vote and the other as non-voting preference shares. The Nordic countries historically had a relatively high percentage of shares with multiple voting rights, although they recently have declined substantially (Henrekson and Jakobsson, 2012). One explanation is the increase in institutional foreign ownership, favoring the "one-share-one-vote" structure. In contrast, loyalty shares, which offer double voting rights to investors after a certain holding period, gained popularity in Italy (Bajo et al., 2020), France (Becht et al., 2020; Belot et al., 2019; Bourveau et al., 2022), Belgium and Spain (Garcia de Enterria, 2022).[3] Consequently, European countries reveal different preferences resulting in a quite heterogeneous legal framework for dual-class shares, which might create a challenge for creating a European Capital Market Union.

The benefits when founders, inventors or entrepreneurs act as CEOs for some time are well evidenced (Islam and Zein, 2020; Byun et al., 2021). Despite these well-known benefits, dual-class shares, granting the minority owner the majority of the votes, may create severe agency and corporate governance problems (Anderson et al., 2018; Gompers et al., 2010; Masulis et al., 2009; Smart et al., 2008; Smart and Zutter, 2003).[4] Therefore, the pivotal question is whether and under which circumstances any vote concentration, jointly with minimal economic exposure, is superior and more beneficial for the long-term success of the company and

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[1]   Conversely, the opposite trend occurred for the adoption of classified boards in IPOs and established firms in the U.S. (Field and Lowry, 2020).

[2]   Interestingly, the High Level Forum on the Capital Markets Union recommends the introduction of dual-class share structures, as they protect smaller firms from takeovers through larger firms, incentivize founders to commit to sustainable growth and foster a long-term perspective for firms while keeping a public market listing attractive (EU, 2020a). This also ends the opposing stance of the European Commission to mandate the "one-share-one-vote" principle (2001, 2007). See Lidman and Skog (2021) for a short history of the debate.

[3]   Moreover, loyalty shares are also legally available in the Netherlands for a long time. In July 2020, the European Commission published a report on sustainable corporate governance, postulating the wider use of loyalty shares to counter short-termism in EU corporate governance (EU, 2020b). For a critique of this proposal, see Roe et al. (2021).

[4]   In addition, shares with multiple voting rights provide the founder and management with some protection against the concerted voting of institutional investors, or the vote recommendations by proxy advisors.

for its shareholders.[5] Most likely, the relative advantages of dual-class shares diminish when firms advance through their life cycle. It is likely that the founder's technological advantage and insights fade away, and keeping the majority of the votes could be unfounded and harmful. Therefore, the voting structure requires some adjustment, leading to a decline of shares with multiple voting rights. Alternatively, management or shareholders could initiate to merge all shares into the "one-share-one-vote" structure. A serious problem occurs only when the owners with the majority of votes prevent these adjustments, and therefore harm most minority shareholders. Consequently, precautionary measures are a prerequisite for all dual-class shares structures to deal appropriately with this challenge. The objective of our research is to add to the controversial discussion on the benefits and costs of dual-class shares by providing empirical evidence on the firm valuation and operating performance differences between single- and dual-class firms traded on European securities markets.

Our results indicate regional and country-specific firm outcomes associated with dual-class share structures. We find a relative valuation discount in Denmark, Finland, Sweden and Switzerland, while dual-class firms have a superior operating performance in Denmark, Finland, Austria, Germany, France, Spain and the U.K. In this context, founding family ownership, operational efficiency and agency problems are potential mechanisms affecting valuations and operating performances of dual-class firms in some countries. However, major securities market developments that occurred during the last decade did affect some of our above conclusions and require a fresh perspective. Several large entrepreneurial high-tech firms went public in the U.S. using shares with multiple voting rights (Aggarwal et al., 2022), which not only outperformed single-class firms but also reached a superior firm valuation in the years subsequent to the IPO (Cremers et al., 2020; Kim and Michaely, 2019). The protection against short-term investor demands and of the unique vision and superior leadership and technological skills of the inventor and founder CEOs (Goshen and Hamdani, 2016; Islam and Zein, 2020) might be the reason for the superior returns to investors. An example of an extremely successful dual-class IPO in 2004 backed by private equity and led by their founders is Google (now Alphabet). For Europe, our findings also suggest that high-growth firms with multiple-voting shares (Nordic countries, U.K, Switzerland) and preference shares (Southern countries, Austria, Germany) generate a superior operating performance that translates into a valuation premium. However, these are mostly established (family) firms that went public and are less comparable to the entrepreneurial high-tech firms with dual-class shares on the U.S. exchanges.

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[5]   These are opposite avenues to prevent short-termism and to incentivize either management or investors to take a long-term investment perspective.

The rest of this study proceeds as follows. In the next section, we review the literature and develop our hypotheses on dual-class shares in Europe. Section III describes the data, sample and methodology. In Section IV, we present our empirical results on the effects of dual-class shares on firm valuation and operating performance. Section V contains a summary and a discussion of the empirical findings for the different forms of dual-class shares in Europe. Section VI concludes.

2. Literature Review and Hypothesis Development

There exists already a large body of literature on dual-class shares, which we summarize in this section. We structure our discussion into four different subsections. (1) the history of dual-class shares in the U.S., (2) their benefits and costs, (3) their performance, and finally (4) the institutional investor perspectives.

2.1 Dual-Class Shares in the U.S.

2.1.1 History of Dual-Class Share Structures

Dual-class shares already existed in the U.S. since the end of the nineteenth century and gained importance during the 1920s. Examples are the International Silver Company issuing non-voting shares in 1898 and the Dodge Brothers' IPO in 1925. The NYSE, however, prohibited unequal voting rights in 1926 and kept this regulation until 1985, with the exceptions of Ford's IPO in 1956 (Howell, 2017). In contrast, AMEX allowed non-voting shares under certain conditions. Nevertheless, the "one-share-one-vote" principle became the common structure, and it constitutes one of the key characteristics of a good corporate governance system. This remained so until the 1980s, when companies explored protective means against hostile takeovers. Subsequently, all U.S. stock exchanges (NYSE, AMEX, and NASDAQ) adjusted their voting-right regulation, allowing dual-class shares again since 1994 (Howell, 2017, 2010; Lel et al., 2021).

More recently, the debate on dual-class shares and its governance implications revived when several companies went public by issuing shares with unequal voting rights (Aggarwal et al., 2022). Beginning with Google's (now Alphabet) IPO in 2004, an increasing number of larger entrepreneurial high-tech companies such as Alibaba, Dropbox, Facebook (now Meta), Snap, Spotify[6], and Palantir went public with dual-class (or multi-class) share structures. An excellent example for this fundamental shift is Dell, one of the largest high-tech companies in

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[6] Interestingly, the company chose a single-class structure, but granted insiders 10 beneficiary certificates for each ordinary share, each providing one additional vote.

the world. In 1988, Dell went public with single-class shares, delisted with a leveraged buyout by the founder to reorganize the company in 2013, and went public again in 2018, but this time with dual-class shares (Bebchuk and Kastiel, 2019b). Moreover, founder-managed unicorns favor the dual-class share structure when going public.[7] Companies have employed different means such as staggered boards, voting right ceilings, and poison pills (Chemmanur et al., 2021) to limit the influence of certain investor groups, as companies planning to go public often want to cope with the likely short-termism of capital markets (Fried and Wang, 2019; Kaplan 2018; Roe, 2018). Staying private and obtaining additional private equity is one alternative, which U.S. firms increasingly use (Ewens and Farre-Mensa, 2020; 2022; Kwon et al., 2020; Chernenko et al., 2021). However, even larger private-equity-backed companies (unicorns) eventually will go public, having to decide on the allocation of ownership and control. One approach is to separate the cash flow and voting rights prior to the IPO so that the majority of the votes always or at least for some period stays with the family, entrepreneur or founder of the company (Kim and Michaely, 2019; Cremers et al., 2020).[8] As the companies' preference for such a legal construction has started to grow worldwide[9] and especially intensified in the U.S.[10], most of the largest international stock exchanges adjusted their regulation by introducing and allowing shares with unequal voting rights (Guerra-Martínez, 2021).[11]

2.1.2 The Benefits and Costs of Dual-Class Shares

Shares with multiple voting rights are usually attractive for founders preferring more voting rights (control) relative to their economic exposure (ownership). In contrast, more cash flow rights appeal to investors with no interest in exercising control but with a preference for

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[7] Recent examples are Airbnb, Coinbase, Lyft, Pinterest, Rivian, Robinhood, Slack, Snowflake, and Zoom. Many successful start-ups and growth companies in the U.S., especially the large unicorns with a market valuation above one billion US$, might have postponed their going public if dual-class share structures were unavailable.

[8] Firms led by CEOs with innovation experience (inventor CEOs) have higher quality innovations and file more patents (Islam and Zein, 2020; Byun et al., 2021). For the economic importance of entrepreneurs to the success of their startups, see Becker and Hvide (2022).

[9] For about 20 years, the weight of stock with unequal voting rights in the MSCI World Index remained rather low and stable below 2% (1970-1990) and started to grow continuously to about 10% by 2017 (MSCI, 2018a).

[10] In 2021, 968 firms went public in the U.S., of which 613 were SPACs (63%), while the remaining 355 IPOs are operating companies. Of these 355 IPOs, 94 (26.6%) issued dual-class shares with 62 in the form of traditional IPOs, 6 direct listings and 25 de-SPAC mergers (CII, 2021). For recent analyses on the legal structures, costs and performance of SPACs, see Gahng et al. (2021) and Klausner et al. (2022).

[11] Recent examples are the exchanges in Singapore, Hong Kong, Shenzhen, and the STAR Market at the Shanghai Stock Exchange, alleviating the competitive disadvantage for attracting Asian companies (Yan, 2021a). In addition, the Indonesian Stock Exchange introduced multiple voting shares to boost unicorns IPOs (Tani, 2021) and Seoul plans to follow (Ye-Eun, 2021). On the company level, Alibaba is a perfect example, as it first listed in the U.S., as dual-class shares were disallowed in Asia, but cross-listed in Hong Kong as the dual-class share option became available. In Europe, Portugal allowed multiple-voting shares in 2022 (Festas and Reis, 2022).

higher returns (Lund, 2019). Although many of the more recent high-tech companies in the U.S. have not been public for very long, the available data suggests that these dual-class companies out-perform single-class structured companies for some years subsequent to the IPO (Kim and Michaely, 2019; Cremers et al., 2020). This in contrast to older U.S. studies that documented a relative valuation discount of dual-class firms compared to single-class firms (Gompers et al., 2010; Smart et al., 2008; Smart and Zutter, 2003). Due to the disproportionality of ownership and control, this structure always provoked controversial debates. This discussion intensified in 2017, when Snap Inc. issued shares to the public with no voting rights at all (Bebchuk and Kastiel, 2017; Berger, Bochnewr and Sonsini, 2017; Kalb and Yates, 2017; Nicholas and Marsh, 2017). Company founders argue that retaining superior voting power protects them from market pressure[12], being forced to deliver short-term results, but instead allowing them to focus on long-term shareholder value (Baran et al., 2020; Atanassov et al., 2018; Goshen and Hamdani, 2016; Jordan et al., 2016). This may also alleviate the agency conflict of underinvestment as non-voting shares allow financing positive net present value projects without diluting the founder's control rights (Banerjee and Masulis, 2018). Megginson et al. (2008) provide evidence for the U.S. for an earlier period that dual-class firms issue additional equity (SEOs) to finance growth opportunities. Moreover, inventor and founder CEOs having hands-on innovation experience, produce higher quality innovations and file more patents (Islam and Zein, 2020).[13]

However, the challenges persist as founders prefer keeping the private benefits of control through dual-class shares, while limiting their economic exposure, and possibly engaging less in long-term investments (Arugaslan et al., 2010). In contrast, controlling shareholders counter that the concentration of voting power enables them to express their views and participate in important corporate governance decisions. Therefore, dual-class shares are beneficial for investors as long as management performs well and outside monitoring and control by investors are less important for the moment and hardly value enhancing. In contrast, dual-class shares could be value destroying if management performs poorly and investors have no effective control over management or cannot replace it (Bebchuk and Kastiel, 2019a, 2017). The

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[12] This includes protection from hostile takeovers and uninformed shareholder demands as well as allowing signaling stability and credibility (bonding). There should be less managerial short-termism but the risks are entrenchment and the overall increase in agency costs.

[13] Google is an example of a successful dual-class company, providing high returns to investors since going public in 2004. In their founders' IPO letter in 2004, the owners clarified to investors what their position and their rights were by investing in Google: *"New investors will fully share in Google's long-term economic future but will have little ability to influence its strategic decisions through their voting rights"*. Therefore, it is essential to clarify the disproportionately low voting rights to investors.

quote at the top of this article from Andrew Hill summarized both possible outcomes well.

2.1.3   Performance of Dual-Class Shares and Market Indices

One controversial debate of dual-class shares is related to market indices (Hirst and Kastiel, 2019; Winden, 2018; Winden and Baker, 2019). The pivotal question is whether companies with multiple-voting shares should be eligible for inclusion in equity indices (FTSE, 2017; MSCI, 2018a, b). The alternative query is whether index providers should offer different indices, some with and others without dual-class shares. For institutional investors, a different perspective is more important, as they are mainly concerned about the higher or lower risk-return tradeoff of dual-class shares and the valuation effects of voting rights. Nevertheless, most of the U.S. index providers (S&P Dow Jones and FTSE Russell) are not including newly publicly listed companies with dual-class shares in their indices.

Interestingly, a recent study by MSCI (2018c) analyzing the performance of dual-class shares and the risk-return attribution in North America, concludes that they outperformed single-class shares by 4.5% annually. Company-specific effects accounted for 4% (with sectors adding 2% and style factors detracting about 1.5% per year). In emerging markets, only company-specific effects determine the outperformance, whereas in Europe, the exposure to common risk factor explains the outperformance of dual-class shares (MSCI, 2018c). These results indicate that in the U.S. and in emerging markets, the outperformance of individual companies having a dual-class share structure relates to the skills of the founder or entrepreneur, whereas in Europe, these benefits are currently unobservable. However, they may arise again in the future when more European high-tech firms list on European instead on U.S. exchanges.

2.1.4   Active versus Passive Institutional Investors and Dual-Class Shares

There are some intense and controversial debates whether dual-class shares favor investors by offering higher growth rates and abnormal performance, or whether dual-class shares are only benefitting management and disadvantaging investors, especially when there is no opportunity to amend or drop this multiple voting structure later on. Therefore, dual-class shares may result in an over-concentration of power in the hands of a few founding shareholders, amplifying the conflict of interest and agency problems that the "one-share-one-vote" principle should mitigate (Masulis et al., 2009; Burkart and Lee, 2008).

Generally, active investors are able to judge for themselves whether the growth prospects of a particular company or the superior skills of a visionary entrepreneur justify relinquishing voting rights. Even without equal voting rights, active investors can subsequently sell or short the stock of companies when growth prospects deteriorate or when insiders mismanage

the company. Consequently, active investors do not require a specific protection as they can always use the exit route. In contrast, passive investors have no such choices as Index Funds and ETFs usually include all index constituents (Bebchuk and Hirst, 2019a, b; Bessler and Hockmann, 2016, 2021). The same idea also holds for large index-oriented long-term institutional investors (quasi-indexers). For these investor groups, engagement through voting or public agitation is the only way to affect changes in corporate policy, making voting rights an important instrument for passive investors. One possible avenue is to support shareholder activism or to convince hedge funds to attack specific companies.[14]

However, not the individual investor exercises the voting right, but instead Index Funds and ETFs providers such as BlackRock, Vanguard, and State Street have the fiduciary duty to exercise the votes in shareholder meetings. They may perform their own detailed analysis on how to vote, but most often engage proxy advisory firms (ISS and Glass Lewis) which provide recommendations on each agenda item in the shareholders' meeting. Alternatively, they could support hedge funds or environmental activists, which usually engage more actively and aggressively with companies (Appel et al., 2019; Fisch et al., 2019; Ball et al., 2021).

2.1.5   *Controversies and Potential Solutions to the Dual-Class Shares Debate*

Therefore, many of the world's largest mutual funds and other investors have joined forces to take a strong stance against dual-class structures. Especially the institutional investor side in the U.S. expressed their thoughts of how to solve the dual-class shares problem. Some have called upon the NYSE and NASDAQ to require all companies that go public with dual-class shares to include a time-based "sunset provision" (Council of Institutional Investors, 2018), which, however, also entails particular problems and therefore is debatable as appropriate response to dual-class shares (Fisch and Solomon, 2019). Institutional investors also discourage index providers (S&P Dow Jones and FTSE Russell) to include firms with dual-class shares, and proxy advisory services oppose these structures as well (Berger and Hodrick, 2018). Even the SEC's Investor Advisory Committee has raised its own concerns about dual-class companies, calling on the SEC to "devote more resources" to "identify risks" arising out of governance disputes from dual-class shares (SEC, 2018). They all pretend that it is important

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[14]   The economic idea is that passive investments (ETFs) will generate a lower performance relative to active mutual funds if the index contains a few severely underperforming companies, which active managers can avoid to increase the relative share of outperformers. Although it is possible to hedge the risk of individual companies or an industry ETF (Huang et al., 2021), it is easier to attack these firms directly to generate a higher future performance. Therefore, ETFs and activist hedge funds may act together in that the ETF provider suggests to targeting a specific firm, and support the hedge funds later on with votes. For managing successful activism campaigns, hedge funds usually require the support of institutional investors (Bessler and Vendrasco, 2022a, b).

to protect shareholders' rights, particularly those of minority shareholders, by promoting the "one-share-one-vote" principle.

However, the intention of institutional investors might be to act in their own self-interest and not so much in that of minority shareholders. Therefore, the critical question is whether institutional investors are better equipped than the founders, inventors and entrepreneurs to decide on the research and innovation agenda and on the strategic challenges of the firm. The evidence suggests that this is hardly the case. However, institutional investors are usually supposed to perform an important monitoring function by controlling management, which they hardly perform perfectly today, as they substitute their own analysis by buying recommendations from proxy advisory firms.[15] Therefore, the concentration of voting rights of institutional investors as a group and the opportunity to use this power not only to exercise control but also to interfere in other major strategic decisions constitutes a major challenge. From the founder's perspective, this is a sensible issue and it is essential to avoid such a situation by keeping the majority of the votes. This is especially the case when the privately held start-up firm has already reached a unicorn valuation (more than 1 billion US$). Consequently, the founder's choice is either to go public with multiple-voting shares or stay private to keep control. Regulators and exchanges have to decide either to accommodate the founders' preferences or to witness how these firms list on a foreign exchange allowing dual-class shares, such as in the U.S.[16]

Interestingly, the entire discussion and all empirical studies exclude loyalty shares (Europe) or time-phased voting shares (U.S.), which are currently advancing as a new structure, at least in some European countries.

2.2 Dual-Class Shares in Europe

2.2.1   The Popularity of Shares with Unequal Voting Rights across European Countries

The renewed prominence of dual-class shares in the U.S. and Asia demands a comprehensive analysis of the benefits and costs for Europe.[17] Especially its ambiguous effects on

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[15]   This is understandable, as the competition between institutional investors is on net returns, so minimizing costs is essential, especially relative to low-cost passive funds (ETFs). Since mutual funds have to vote on all items at a shareholders' meeting, it is sensible from their perspective to follow the crowd (BlackRock, 2020). Interestingly, mutual funds try to signal the impression that they arrived at the decision based on their own analysis, although there is no evidence whether they performed it themselves or only followed the recommendations.

[16]   In fact, China introduced shares with multiple voting rights on its stock exchanges in Shanghai (STAR Market) and Shenzhen in 2019 and 2020, respectively. Before many Chinese firms went public in the U.S. with dual-class shares. However, there are two important developments. First, China is restricting firms to list in the U.S., and second, U.S. regulators force Chinese firms to delist from U.S. exchanges, as most of them do not comply with U.S. disclosure regulations. This left China with little choice other than permitting dual-class shares.

[17]   Currently, all European countries legally permit issuing dual-class shares with some restrictions on non-voting shares without any preferential rights such as dividends and shares with multiple voting rights (**Table 1**).

corporate governance quality and the market for corporate control require some further analysis. Whether the evidence is more against or in favor of dual-class shares is essentially an empirical question, possibly leading to stricter regulation or even a ban. It is also possible that countries will introduce shares with multiple voting rights, which they have previously prohibited. Therefore, the outcome and structure most likely is country dependent (Guerra-Martínez, 2021). Germany, for example, outlawed multiple-voting shares already more than two decades ago (1998). However, dual-class share structures have existed for more than a century in many European countries (Cronqvist and Nilsson, 2003; Bennedsen and Nielsen, 2010), providing sufficient empirical evidence from many decades of academic research[18] and practical experience.

Historically, European and in particular the Nordic countries revealed a high concentration of ownership and control. Moreover, family firms and companies led by an insider group often employed dual-class shares as control-enhancing mechanisms to benefit from a public listing, while still preserving the majority of control rights (Bennedsen and Nielsen, 2010). Often companies deemed dual-class structures essential for creating long-term shareholder value and for escaping short-termism pressure. Although favored in the Nordic countries (Henrekson and Jakobsson, 2012) and in Switzerland (Nüesch, 2016) for many decades, dual-class shares have lost importance. The increase of U.S. institutional investors in Europe since the new millennium, with their specific corporate governance perspectives ("one-share-one-vote"), may have inspired or forced companies in the Nordic countries to abandon this structure. Moreover, IPOs hardly employ dual-class shares any longer in the Nordic and other European countries. Interestingly, Italy allows the issuance of multiple-voting shares for non-listed companies and for firms going public since 2014. This is one initiative to make a public listing more attractive after some key Italian companies migrated to foreign countries (Sandrelli and Ventoruzzo, 2018; Santoro et al., 2015; Ventoruzzo, 2015).

In addition, loyalty shares advanced in Belgium, France, Italy and Spain as another form of shares with unequal voting rights, offering the owner double voting privileges after holding shares for more than two years (Becht et al., 2020; Belot et al., 2019; Bourveau et al., 2022).[19] Whether dual-class shares or loyalty shares are more beneficial with or without additional regulation is a controversially debated issue (Bebchuk and Kastiel, 2019a, 2017; Lund, 2019; Roe and Venezze, 2021) that requires further empirical evidence especially for Europe. This issue

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[18]   See Burkart and Lee (2008) and Adams and Ferreira (2008) for an excellent review and critical discussion of theoretical and empirical studies on dual-class shares on the state of research at that time, respectively.

[19]   In the U.S., these shares are classified as "time-phased voting" arrangements and have been controversially discussed since long, see Berger, Solomon and Benjamin (2017), Dallas and Barry (2016), and Quimby (2013).

Table 1: Institutional Background on Shares with Unequal Voting Rights in Europe

Jurisdiction	Issuing a class of shares with: Limited voting rights	Without voting rights	And without preferential rights to dividends	Multiple voting rights	Loyalty Shares
Austria	Allowed	Allowed	Not allowed	Not allowed	-
Belgium	Allowed	Allowed	Allowed	Allowed	Allowed (2020)
Denmark	Allowed	Allowed	Allowed	Allowed	-
Finland	Allowed	Allowed	Allowed	Allowed	-
France	Allowed	Allowed (Max 25%)	-	Allowed	Allowed (2014, opt-out)
Germany	Allowed	Allowed: (Max 50%)	Not allowed	Not allowed	-
Italy	Allowed (Max 50%)	Allowed (Max 50%)	-	Allowed	Allowed (2014)
Norway	Allowed	Allowed	-	Allowed	-
Portugal	Allowed	Allowed (Max 50%)	Allowed	Allowed (2022)	-
Spain	Allowed	Allowed (Max 50%)	Not allowed	Not allowed	Allowed (2021)
Sweden	Allowed	Not allowed	-	Allowed (1/10)	-
Switzerland	Allowed	Allowed	Allowed	Allowed	-
United Kingdom	Allowed	Allowed	Allowed	Allowed	-

Notes: The table above represents an overview on the regulation related issuing a class of shares with limited voting rights or multiple voting rights across the jurisdictions included in our sample. Source: OECD Corporate Governance Factbook 2021 with further amendments related to loyalty shares by the authors.

might even develop into a regulatory competition between European jurisdictions and may add substantial complexity for creating a European Capital Market Union.[20] The efforts for capital market integration and the harmonization of capital market and corporate governance standards in Europe are an important and critical issue that these diverse developments could jeopardize.

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[20] See the discussion in Howell (2010), page 7, how the three U.S. exchanges (NYSE, AMEX, and NASDAQ) agreed on the definition and rules in May 1994. In this context, see also Lel et al. (2021) for the market reactions and economic consequences of these regulatory events.

2.2.2 Value of the Voting Rights and Share Unifications in Europe

The value of voting rights is pivotal in corporate governance research (Yermack, 2010; Nenova, 2003 for cross-country studies). Most studies document a positive price differential between shares with and without voting rights (spread)[21]. The reasons are agency, control and other governance concerns as well as liquidity issues,[22] indicating that the value of voting rights reflects the private benefits of control (Dyck and Zingales, 2004; Zingales, 1995). This value usually decreases in better information environments, for example, with more transparent and comparable financial reporting standards such as after the introduction of IFRS (Hong, 2013). In contrast, dual-class firms may provide inferior information due to employing accrual-based earnings management (Li and Zaiats, 2017, Tinaikar, 2017). They face difficulties in fair price discovery of voting and non-voting shares (Niehoff, 2016) as well as the risk of a stock price crash (Hong et al., 2017).

An interesting issue in Europe is that dual-class shares owners possessing the majority of the voting rights are at some stage willing to abandon their voting dominance. The typical step is to grant all shares equal votes by unifying all share classes.[23] The empirical evidence on the determinants and consequences is as follows. Firms with lower scores of private benefits of control, higher institutional ownership, higher growth opportunities and a greater need for external financing have a higher likelihood to unify their shares (Bigelli et al., 2011; Maury and Pajuste, 2011; Pajuste, 2005). In addition, higher costs of capital (Ehrhardt et al., 2008), media and reputational pressure (Braggion and Gianetti, 2019; Lauterbach and Pajuste, 2017), the magnitude of the reduced voting power (Dittmann and Ulbricht, 2008) as well as index membership (Betzer et al., 2017) expedite the unification decision. Most studies conclude that voluntary stock unifications lead to enhanced corporate governance mechanisms resulting in positive announcement (Maury and Pajuste, 2011; Dittmann and Ulbricht, 2008; Ehrhardt et al.,

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[21] Kalay et al. (2014) proposed a new method using option prices to estimate the value of the voting right.

[22] For the empirical evidence, see the following country studies. Denmark (Neumann, 2003), Finland (Broussard and Vaihekoski, 2019), France (Boubaker et al., 2014; Muus, 1998), Germany (Niehoff, 2016; Jaron, 2011; Dittmann, 2003; Daske and Ehrhardt, 2002; Fatemi and Krahnen, 2000), Italy (Bigelli and Croci, 2013; Caprio and Croci, 2008; Nicodano, 1998; and Zingales, 1994), Norway (Ødegaard, 2007), Switzerland (Gardiol, 1997; Horner, 1988) and the U.K. (Megginson, 1990). Non-U.S. firms that are cross-listed on U.S. exchanges have a lower voting premium and private benefits of control, suggesting that bonding to stronger investor protection improves corporate governance (Doidge, 2004).

[23] In contrast, the consolidation of control through dual-class recapitalizations, in that firms change from "one-share-one-vote" into a dual-class shares structure is associated with positive valuation effects in British firms (Ang and Megginson, 1989). For the U.S., many studies focused on dual-class recapitalizations from different perspectives (Dimitrov and Jain, 2006; Amoako-Adu and Smith, 2001; Lehn et al., 1990; Jarrell and Poulsen, 1988).

2008; Pajuste, 2005) and long-term valuation effects (Lauterbach and Pajuste, 2015). In contrast, controlling shareholders repurchasing shares to increase their relative holding ex-ante, offsetting partially the expected control dilution, experience insignificant price reactions (Lauterbach and Yafeh, 2011). As most start-up firms go through a life cycle with respect to the relative advantages of the founder, inventor and entrepreneur, the above empirical evidence is important for determining the best point in time and the optimal mechanisms to convert dual-class into single-class shares. A decision based on market valuation effects and discount seem superior to a time-based conversion.[24]

2.3 Hypotheses on the Valuation Effects of Dual-Class Shares and Potential Channels

Based on the discussed literature and our own perspective, we derive six hypotheses in this section that we test empirically for firms from 13 European countries. Given the previous empirical evidence from Europe and the current observations from the U.S, the intriguing question is why some European countries experience a decline in listed firms with dual-class shares as well as fewer IPOs employing this structure. One possible reason is the well-documented valuation discount for dual-class firms relative to single-class firms. Especially, control-enhancing mechanisms such as pyramidal and dual-class shares structures often results in lower firm valuations on European stock markets (Bennedsen and Nielsen, 2010; Eklund and Poulsen, 2014; Laeven and Levine, 2008). This evidence finds support in many other studies.[25] Based on the literature, we postulate our first hypothesis:

Hypothesis 1:   **Dual-class firms** have a **lower** firm valuation relative to single-class firms (Tobin's Q).

Despite being lower valued, it is still possible that, due to the founders' insights and abilities, dual-class firms are operationally the superior-managed entities. From the above arguments and the previous literature, we derive our second hypothesis on operating performance:

Hypothesis 2:   **Dual-class firms** have a **superior** operating performance relative to single-class firms.

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[24] There are several positive examples of extremely successful dual-class firms (e.g. Google) and single-class firms (e.g. Amazon). In contrast, the concentration of voting rights through multiple-voting shares in information technology conglomerates such as Facebook is critical in many aspects.

[25] See for Finland (Maury and Pajuste, 2005), Germany (Ehrhardt and Nowak, 2015), the Netherlands (Roosenboom and Goot, 2005, 2003), Sweden (Bjuggren and Palmberg, 2010; Bjuggren et al., 2009; Holmén and Nivorozhkin, 2007; Cronqvist and Nilsson, 2003), and Switzerland (Nüesch, 2016; Schmid, 2009). In contrast, Nüesch (2016) finds that the effect of dual-class shares on operating performance is positive for firms with a need for external finance, which may increase the external monitoring.

For testing this hypothesis, we employ *Return on Assets*, *Returns on Equity, Returns on Sales,* and *Returns on Investments* as dependent variables (Hettler and Forst, 2019).

However, it is important to explicate the factors that determine the differences in firm valuation and operating performance. One reason is that founding families mainly exercise control in European firms with dual-class shares (Holmén and Högfeldt, 2004; Cronqvist and Nilsson, 2003). The entrenchment effect[26] advocates that often the owners of majority voting rights extract private benefits of control at the expense of minority shareholders (Bennedsen and Nielsen, 2010). Furthermore, with unequal ownership and control rights the controlling shareholder has relatively less economic exposure resulting in a lower incentive to monitor management. Moreover, families and entrepreneurs retaining the majority of the voting rights hardly face hostile attacks from activist investors or in general from the market for corporate control (Grossman and Hart, 1988), leading to a lower valuation. This may also result in less efficient investment decisions (Bebchuk and Kastiel, 2019a).[27] In fact, various studies for Swedish family firms with dual-class shares find an inferior investment policy (Bjuggren and Palmberg, 2010; Bjuggren et al., 2007) and a lower probability of being taken over (Holmén and Nivorozhkin, 2007; Cronqvist and Nilsson, 2003). Both aspects typically result in lower valuations. Finally, family firms relative to non-family firms, both with dual-class, trade at an even larger discount in Europe (Bennedsen and Nielsen, 2010) and especially in Sweden (Holmén and Högfeldt, 2004; Cronqvist and Nilsson, 2003). Following these observations and arguments for family firms, we derive our third hypothesis:

Hypothesis 3:   ***Family controlled* dual-class** firm experience an even **larger** valuation discount relative to non-family dual-class firms.

In addition, agency conflicts and corporate governance issues arising from the separation of ownership and control should have a high explanatory power. The life-cycle theory of Bebchuk and Kastiel (2017) suggests that the early benefits of dual-class shares tend to vanish over time, whereas agency costs typically increase. Based on these arguments and the empirical evidence, we formulate the fourth hypothesis:

Hypothesis 4*:**   **Dual-class firms** are associated with an **increase** in agency problems ***over time.

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[26] The counteracting effect is the incentive of the shareholder to monitor the management when his economic exposure increases with ownership (incentive effect) (Bennedsen and Nielsen, 2010).

[27] Alternatively, dual-class shares might be beneficial in mitigating managerial myopia in the context of takeovers (Burkart and Lee, 2008) and for shareholders in general (Bennedsen and Nielsen, 2010).

Moreover, the deteriorating operational efficiency of dual-class shares over time potentially reflects the increasing agency costs. For the U.S., Kim and Michaely (2019) provide supporting evidence for declining operating margins and labor efficiency in dual-class firms. From this follows our next hypothesis:

Hypothesis 5*:**   **Dual-class firms** experience **lower** operational efficiency ***over time.

To test this hypothesis, we estimate the real effects of dual-class structures in more detail using *Operating Margin, Asset Turnover,* and *Labor Productivity* as dependent variables.

Another potential channel is that the agency issues of dual-class firms are associated with higher systematic risk due to management entrenchment effects, such as the aversion to divest assets and lay-off employees during times of economic difficulties ("quiet life"). The higher downward adjustment costs are a potential source for this systematic risk. Kim and Michaely (2019) provide empirical evidence for this conjecture for dual-class share firms in the U.S. This observation results in our sixth and final hypothesis:

***Hypothesis 6*:**   **Dual-class firms** are associated with **higher** downward adjustment costs.

For testing this hypothesis, we examine the *q*-sensitivity of dual-class firms in terms of investment and employment decisions. Finally, we summarize all our hypotheses and the testing results in **Table 9.**

3.   Data and Methodology

3.1 Data

For our empirical analysis, we construct a dataset from 13 developed countries within Europe for the period from 1994 to 2020 (Refinitiv Datastream's constituent lists, research lists, Worldscope lists and dead stock lists)[28]. Beginning with the entire stock universe, we exclude foreign firms and match our data set with Worldscope's accounting and financial information. We also omit all firm-year observations with missing, negative or zero values in the following variables: total assets, equity, sales, and market capitalization. Ownership information (2007 to 2016) on the global ultimate owner (GUO) are from the Osiris database (Bureau van Dijk). We

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[28]   We followed the identification process by Hanauer (2014). The countries are Denmark, Finland, Norway, Sweden, Austria, Belgium, Germany, Switzerland, France, Italy, Portugal, Spain and the U.K.

assign firms to one of four ownership groups[29], based on additional information hand-collected from various sources such as annual reports, Bloomberg, firms' websites, and Thomson Reuters. We also tracked the firms' current dual-class shares structure on a yearly basis by employing several publicly available information sources such as annual reports, official filings, and press releases.

The final data set consists of 11,995 publicly listed firms of which 1,302 firms (10.85%) had shares with unequal voting rights at least for one year during the 1994 to 2020 period (**Table 2**). This translates into 123,140 firm-year observations with 15,261 firm-year observations related to dual-class shares in the respective years (12.39%). We apply propensity score matching to construct a matched sample of single- and dual-class firms based on firm size (market capitalization) and industry affiliation (Fama-French 12-industry classification). The aim is to match a single-class firm with the nearest propensity score for each dual-class firm in a given year.

3.2 Description of our Data Set: Dual-Class Shares in Europe

We provide the numbers of single- and dual-class firms for each of our 13 European countries as well as the yearly numbers of firms for the 1994 to 2020 period in **Table 2, Panels A and B**, respectively. **Figure 1** (**Panel A**), portrays the relative share of dual-class firms for each country in the first (1994) and last year (2020) of our sample period. Evidently, the relevance of dual-class shares deteriorated substantially since 1994. In **Panel B**, we depict the development for the relative share of dual-class firms over time in the Nordic countries, which had the highest prevalence of dual-class shares in Europe, and observe a continuous downward trend over the 1994-2020 period. We present the development for the other countries of our sample in the *Appendix*, **Figure A1**, revealing a sharp decline until the turn of the millennium. Subsequently, there is some steady downward trend, which appears rather smaller in the more recent period.

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[29] (1) *Founding Family:* Ultimate owner is an individual person or a family that is the founder or related by blood or marriage to one of the founders and holds more than 25% of the voting rights. (2) *Firms controlled by individuals:* Ultimate owner is an individual person or a family related neither to the founders nor to any of their relatives and holds more than 25% of the voting rights. (3) *Firms controlled by others:* Ultimate owner is neither an individual person nor a family, and is unrelated to the founders and holds more than 25% of the voting rights. (4) *Widely-held firms*: No ultimate owner holding at least 25% of the voting rights identified.

Figure 1: Relative Share of Dual-Class Firms by Country from 1994 to 2020 in Europe

Panel A: Cross-Country Variation of Dual-Class Firms in 1994 (left bar) and 2020 (right bar)
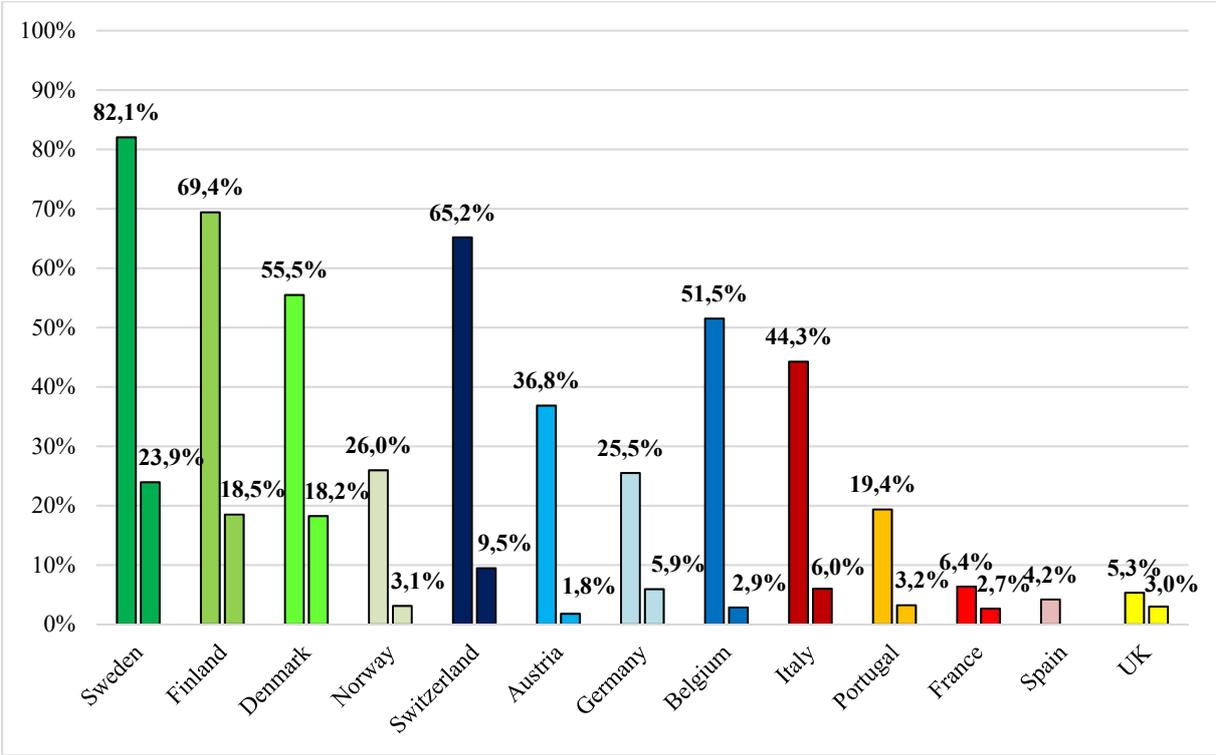
Panel B: Time-Series Variation of Dual-Class Firms in the Nordic Countries
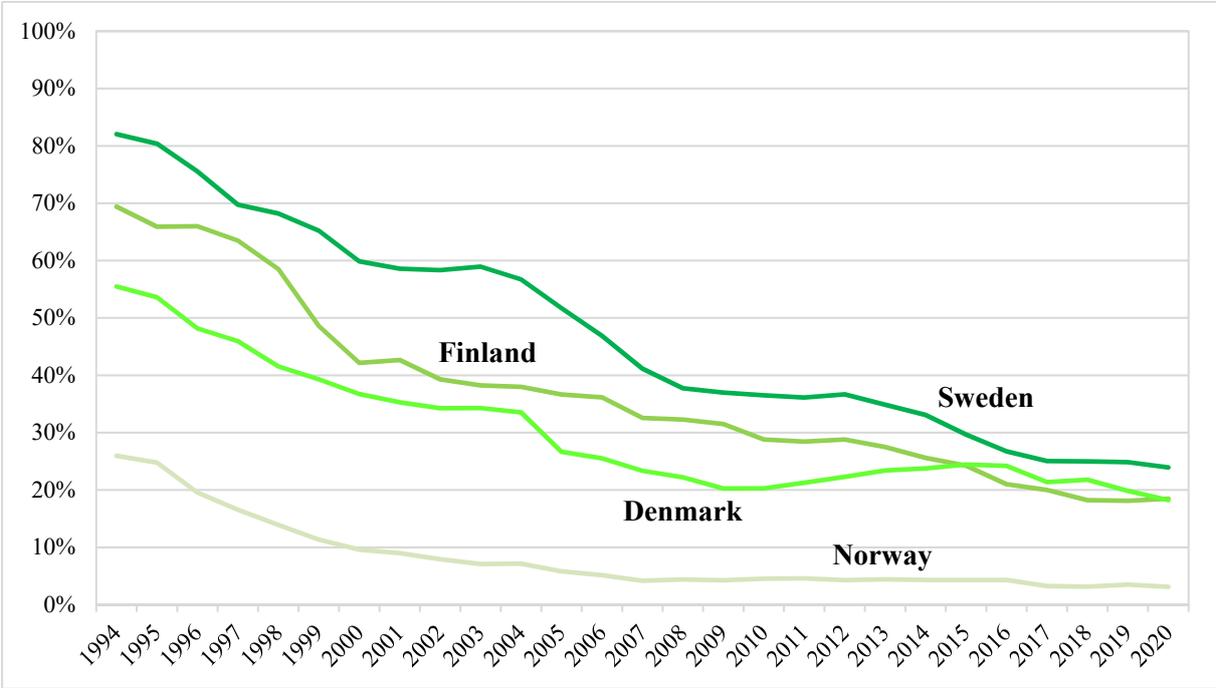
Notes: The figures above represent the relative share of firm-year observations with dual-class shares of the total firm-year observations for each country in the first and last year of the sample period (Panel A) and the relative share of firms with dual-class shares in the Nordic countries over the period from 1994 to 2020 (Panel B). Source: Own calculation based on data from Refinitiv Datastream, annual reports, official filings and press releases.

Table 2: Sample Overview of Dual-Class Shares Firms in Europe

Panel A: Firms with dual-class shares by country

Country	Sample - Firm Years				Sample - Unique Firms			
	Total	Single-Class	Dual-Class	(%)	Total	Single-Class	Dual-Class	(%)
Denmark	4,731	3,288	1,443	30.50%	399	283	116	29.07%
Finland	3,459	2,224	1,235	35.70%	259	170	89	34.36%
Norway	5,218	4,847	371	7.11%	595	557	38	6.39%
Sweden	10,449	6,118	4,331	41.45%	1,151	800	351	30.50%
Nordic countries	23,857	16,477	7,380	30.93%	2,404	1,810	594	24.71%
U.K.	36,756	35,461	1,295	3.52%	4,124	4,001	123	2.98%
Belgium	3,252	2,706	546	16.79%	261	198	63	24.14%
France	19,033	18,295	738	3.88%	1,731	1,681	50	2.89%
Italy	6,815	5,547	1,268	18.61%	653	547	106	16.23%
Portugal	1,565	1,411	154	9.84%	142	123	19	13.38%
Spain	4,375	4,287	88	2.01%	439	430	9	2.05%
Southern countries	35,040	32,246	2,794	7.97%	3,226	2,979	247	7.66%
Austria	2,166	1,820	346	15.97%	186	153	33	17.74%
Germany	19,376	17,244	2,132	11.00%	1,655	1,478	177	10.69%
Switzerland	5,945	4,631	1,314	22.10%	400	272	128	32.00%
German-speaking countries	27,487	23,695	3,792	13.80%	2,241	1,903	338	15.08%
Total	**123,140**	**107,879**	**15,261**	**12.39%**	**11,995**	**10,693**	**1,302**	**10.85%**

Panel B: Firms with dual-class shares by year

Year	Sample - Firm Years			
	Total	**Single-Class**	**Dual-Class**	**(%)**
1994	3,617	2,801	816	22.56%
1995	3,641	2,832	809	22.22%
1996	4,238	3,381	857	20.22%
1997	4,552	3,685	867	19.05%
1998	4,737	3,894	843	17.80%
1999	4,841	4,041	800	16.53%
2000	5,162	4,400	762	14.76%
2001	5,107	4,377	730	14.29%
2002	4,798	4,122	676	14.09%
2003	4,507	3,872	635	14.09%
2004	4,516	3,914	602	13.33%
2005	4,811	4,238	573	11.91%
2006	5,130	4,588	542	10.57%
2007	5,309	4,784	525	9.89%
2008	5,090	4,588	502	9.86%
2009	4,859	4,376	483	9.94%
2010	4,725	4,256	469	9.93%
2011	4,592	4,138	454	9.89%
2012	4,394	3,963	431	9.81%
2013	4,279	3,871	408	9.53%
2014	4,299	3,912	387	9.00%
2015	4,324	3,955	369	8.53%
2016	4,335	3,980	355	8.19%
2017	4,362	4,016	346	7.93%
2018	4,401	4,057	344	7.82%
2019	4,333	3,990	343	7.92%
2020	4,181	3,848	333	7.96%
Total	**123,140**	**107,879**	**15,261**	**12.39%**

Panel C: Firms with dual-class shares by ownership type (2007-2016)

Country	Single-Class Firms						Dual-Class Firms					
	Total	FFF	ICF	OCF	WH	n/a	Total	FFF	ICF	OCF	WH	n/a
Denmark	1,259	77	27	275	522	358	501	0	0	17	7	477
Finland	841	71	24	180	453	113	417	20	0	23	97	277
Norway	2,003	134	96	359	700	714	129	0	4	6	0	119
Sweden	2,793	99	134	477	1295	788	1,581	71	42	163	270	1,035
Nordic countries	6,896	381	281	1,291	2,970	1,973	2,628	91	46	209	374	1,908
U.K.	34,972	5,908	3,040	8,034	16,289	1,701	407	13	6	24	112	252
Belgium	1,018	129	60	387	308	134	228	5	2	32	25	164
France	6,736	2,182	705	1,435	1,542	872	311	44	18	32	55	162
Italy	2,151	617	212	659	386	277	450	22	21	82	25	300
Portugal	401	105	62	116	71	47	65	0	0	5	4	56
Spain	1,458	221	81	337	609	210	150	20	0	23	97	10
Southern countries	11,764	3,254	1,120	2,934	2,916	1,540	1,204	91	41	174	206	692
Austria	637	57	75	258	144	103	99	0	1	20	1	77
Germany	6,610	1,164	757	1,607	1,916	1,166	708	65	11	90	36	506
Switzerland	1,595	90	109	376	734	286	729	37	6	22	8	656
German-speaking countries	8,842	1,311	941	2,241	2,794	1,555	1,536	102	18	132	45	1,239
Total	**62,474**	**10,854**	**5,382**	**14,500**	**24,969**	**6,769**	**5,775**	**297**	**111**	**539**	**737**	**4,091**

Notes: The table presents our sample of single-class and dual-class firms. Panel A shows the distribution by country and region, Panel B the distribution by year and Panel C the distribution by ownership types. The sample includes publicly listed firms from 13 European countries between 1994 and 2020, which we clustered into four regions. We obtain ownership information for the period 2007 to 2016 only and create five categories: (1) *Founding Family (FFF):* Ultimate owner is an individual person or a family that is the founder or related by blood or marriage to one of the founders. (2) *Firms controlled by individuals (ICF):* Ultimate owner is an individual person or a family that is related neither to the founders nor to any of their relatives. (3) *Firms controlled by others (OCF):* Ultimate owner is neither an individual person nor a family and is not related to the founders. (4) *Widely-held firms (WH)*: No ultimate owner holding at least 25% of the voting rights identified (5) n/a: No ownership data available.

In **Figure 2**, we graph the evolution of the number of listed firms, new listings and delistings (both cumulated) for the four Nordic countries during the 1994 to 2020 period.[30] To provide as considerable detail, we distinguish between single and dual-class firms and provide the cumulated number of firms that went public and later delisted (M&A, going private or bankruptcy) from the stock markets during the same period (delist of new lists).

We observe evidently a heterogeneous listing pattern across the Nordic countries. Sweden had 156 listed firms in 1994 that increased to 634 in 2020, whereas the ratio of dual-class firms declined sharply from 82.1% to 23.9%, respectively. In Finland, listings grew from 85 to 143 firms with a sharp decline of the relative share of dual-class firms from 69.4% to 18.5%. In both Nordic countries, however, the new listings exceed the delistings, which is contrast to the listing gap in the U.S. (Doidge et al., 2017; Lattanzio et al., 2022; Eckbo and Lithell, 2022) and other countries (Bessler et al., 2021, 2022). Sweden has 1,044 entries and 565 exits, and Finland 182 entries and 121 exists. In Norway, 356 firms delisted and 509 firms newly listed, increasing the number of listed firms by 146%. However, the relative number of dual-class firms also sharply decreased from 26.0 % to 3.1%. In Denmark, the delistings exceed the new listings resulting in a 14.0% decline from 155 to 136 listed firms, with dual-class shares even dropping from 55.5% to 18.2%. In the *Appendix*, we describe the development for the other European countries (**Section A.1, Figure A.2**). Overall, we observe a declining relative quota of dual-class firms across all Nordic countries, which historically had the largest relative number of dual class firms in Europe. Therefore, it is important to analyze the reasons for these developments in more detail.

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[30] To analyze the number of new lists and delists, we follow Doidge et al. (2017) and classify in the year a firm enters the dataset as new lists and as delist in the year when it exits the data set.

Figure 2: Number of Listed Firms, New Listings and Delistings in the Nordic Countries
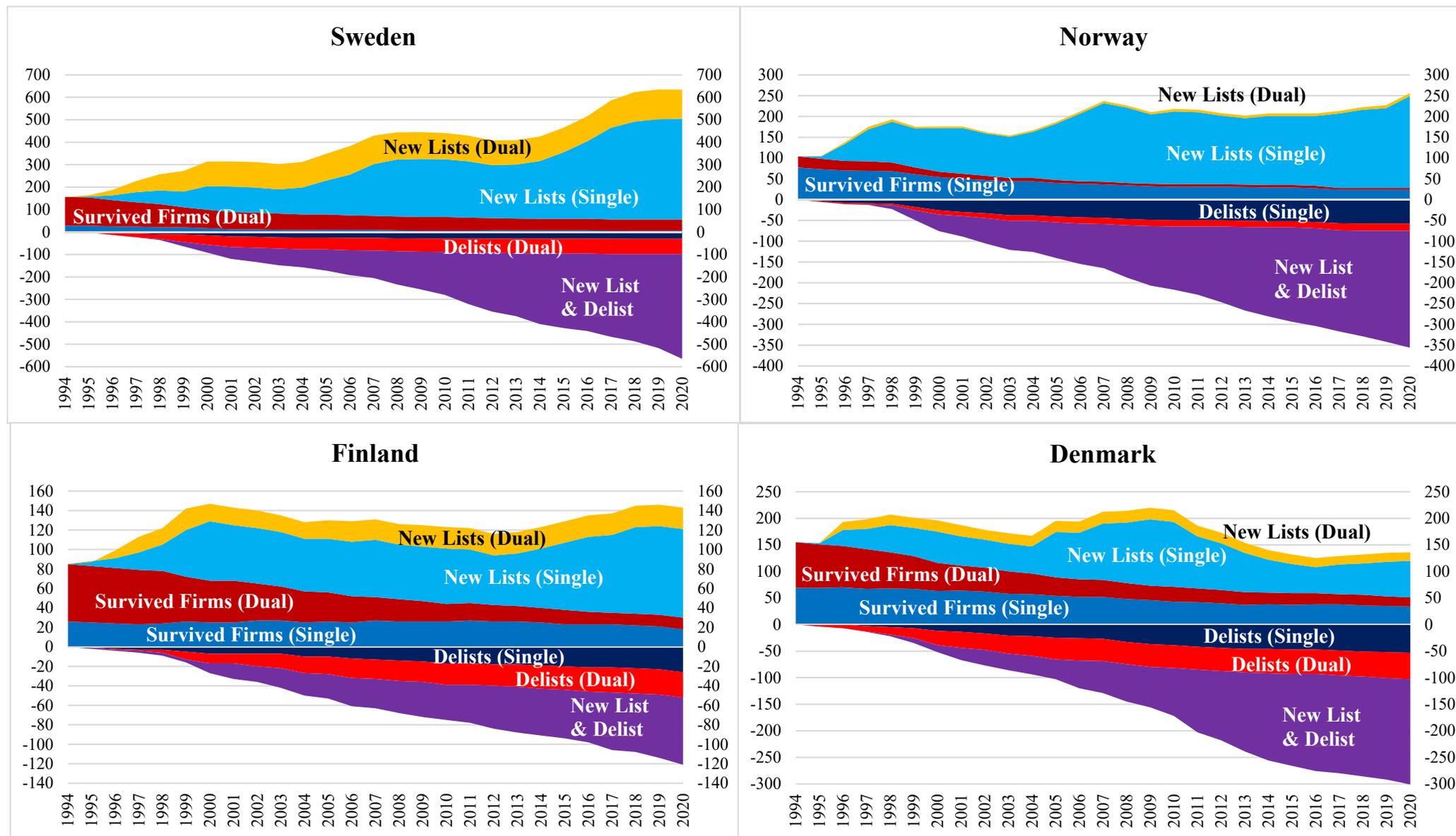
Notes: The figures represent the development of the number of listed firms, new listing (cumulated), delisting (cumulated), and delisting of firms that newly listed during our sample period (cumulated) for the Nordic countries over the period from 1994 to 2020. We do not report detailed data but it is available upon request from the authors. Source: Own calculation based on data from Refinitiv Datastream, annual reports, official filings and press release.

3.3 Methodology

3.3.1 Panel Regressions: Baseline

To test the effects of dual-class shares on firm valuation (*Tobin's Q*) and operating performance (*Return on Assets, Equity, Sales* and *Investment*) we estimate the following model:

$$Dependent\ Variable\ _{i,t} = \beta_1 DCS_{i,t} + \gamma'X_{i,t} + \varphi_{i,t} + \phi_{i,t} + \theta_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where $X_{i,t}$ is a vector of control variables. We control for firm size (natural logarithm of total assets), capital structure (total debt divided by total assets and asset tangibility), investment decisions (R&D scaled by sales and CapEx divided by total assets), payouts (cash dividends relative to total assets), cash holdings scaled by total assets. We also control for unobservable specific characteristics in countries ($\varphi_{i,t}$), years ($\phi_{i,t}$) and Fama-French 12 industries ($\theta_{i,t}$) by including fixed-effects dummies (Kim and Michaely, 2019, Cremers et al., 2020; Kim et al., 2018). However, our main variable of interest is an indicator variable for *Dual-Class Shares (DCS)*, which takes the value of one, if the firm has a dual-class shares structure in the respective year (firm-year), and zero otherwise. $\varepsilon_{i,t}$ represents robust standard errors clustered at the firm-level. **Table 3** includes all definitions and data sources of our variables.

3.3.2 Entrepreneurial High-Growth Firms

Founders, innovators and entrepreneur managed (CEO owned) innovative firms might possess a specific technological knowledge, which may result in superior insights and higher growth opportunities, especially when protected from the short-term capital market pressure. Therefore, we investigate the effects of dual-class shares in entrepreneurial high-growth firms by estimating the following variant of Equation (1):

$$Dependent\ Variable\ _{i,t} = \beta_1 DCS_{i,t} + \beta_2 High\ Growth_{i,t} + \beta_3 DCS_{i,t} \times$$
$$High\ Growth_{i,t} + \gamma'X_{i,t} + \varphi_{i,t} + \phi_{i,t} + \theta_{i,t} + \varepsilon_{i,t} \qquad (2)$$

where *High Growth* is a dummy variable equal to one for each firm of the top tercile in firm-level sales growth rates (Jordan et al., 2016). All the remaining variables we define in Equation (1).

3.3.3 The Role of Family Ownership in Dual-Class Firms

We are also interested in the channels via which dual-class shares affect firm valuation and operating performance and analyze the moderating effects of founding family ownership, the life cycle of the firm, operational efficiency and investment sensitivity. We include a series of ownership variables and construct various groups (as in Anderson et al., 2018) based on our dummies for *Dual-Class Shares* and *Founding Families* in our regression models.

Table 3: Variable Definitions

Variable	Data Source	Description and Construction Principles
Dual-Class Shares	Worldscope, Annual Reports, Filings	Dummy variable, 1 if the firm has dual-class shares with unequal voting rights, zero otherwise.
Tobin's Q	Worldscope	Total assets plus the market value of equity minus the book value of equity divided by total assets.
Size	Worldscope	Total assets of a firm, logarithmized.
Sales Growth	Worldscope	Change in net sales from year t-1 to t, logarithmized.
Return on Assets	Worldscope	Net income relative to total assets.
Return on Equity	Worldscope	Net income relative to book value of equity.
Return on Sales	Worldscope	Net income relative to net sales.
Return on Investments	Worldscope	Net income relative to long-term debt and book value of equity.
Leverage	Worldscope	Total debt relative to total assets.
Tangibility	Worldscope	Net property, plant and equipment relative to total assets.
CapEx	Worldscope	Capital expenditures relative to total assets.
R&D	Worldscope	Research and development expenses relative to net sales.
Dividends	Worldscope	Total common and preferred dividends paid to shareholders of the company relative to total assets.
Cash	Worldscope	Cash holdings relative to total assets.
Founding Family	Osiris	Dummy variable, 1 if the ultimate owner is an individual person or a family that is the founder or related by blood or marriage to one of the founders and holds at least 25% of the voting rights, zero otherwise.
Controlled by Individuals	Osiris	Dummy variable, 1 if the ultimate owner is an individual person or a family that is neither related to the founders nor to any of their relatives and holds at least 25% of the voting rights, zero otherwise.
Controlled by Others	Osiris	Dummy variable, 1 if the ultimate owner is neither an individual person nor a family and is not related to the founders and holds at least 25% of the voting rights, zero otherwise.
Widely-Held	Osiris	Dummy variable, 1 if no ultimate owner holding at least 25% of the voting rights identified, zero otherwise.
Listing Duration	Worldscope	Number of years since the firm went public based on the year the firm enters the dataset.
Mature	Authors' Calculation	Dummy variable, 1 if a firm's listing duration (years from IPO) is above the median in the country where the firm is primarily listed (Kim et al., 2018), zero otherwise.
Operating Margin	Worldscope	EBITDA relative to net sales.
Asset Turnover	Worldscope	Net sales relative to lagged total assets.
Labor Productivity	Worldscope	Net sales relative to lagged number of employees.
Employment Growth	Worldscope	Change in number of employees from year t-1 to t, logarithmized.
Cash Flow	Worldscope	Net income and depreciation & amortization relative to lagged total assets.

Notes: This table represents the data sources, description and calculations of the used variables in our analysis.

We estimate the following variant of Equation (1):

$$Dependent\ Variable_{i,t} = \beta_1 Single - Class\ Founding\ Family_{i,t} + \beta_2 Dual -$$
$$Class\ Founding\ Family_{i,t} + \beta_3 Dual - Class\ Non - Founding\ Family_{i,t} + \gamma' X_{i,t} +$$
$$\varphi_{i,t} + \phi_{i,t} + \theta_{i,t} + \varepsilon_{i,t} \tag{3}$$

where the coefficient of β_1 represents the effect of specific type of controlling shareholder, β_2 controls for the presence of the controlling shareholder in the dual-class firm and β_3 captures the effect of the dual-class shares structure without the specific type of controlling shareholder. Consequently, we disentangle the confounding effect of a certain ownership structure within the relationship between dual-class structures and firm value or performance. All other variables we define in Equation (1).

3.3.4   The Interaction with the Life-Cycle Effect

As Bebchuk and Kastiel (2017) outlined in their life cycle theory, the costs and benefits of dual-class shares are time-variant but declining. Assuming that the comparative advantages and insights of the founder relative to competitors deteriorate over time, we expect a diminishing effect on creating shareholder value relative to single-class firms when dual-class firms mature. For these conjectures, Kim and Michaely (2019) and Cremers et al. (2020) provide empirical evidence for the U.S. by presenting a decreasing valuation premium of dual-class IPOs relative to single-class IPOs over time. We estimate the following variant of Equation (1) to examine the life-cycle effect:

$$Dependent\ Variable_{i,t} = \beta_1 DCS_{i,t} + \beta_2 Mature_{i,t} + \beta_3 DCS_{i,t} \times Mature_{i,t} +$$
$$\gamma' X_{i,t} + \varphi_{i,t} + \phi_{i,t} + \theta_{i,t} + \varepsilon_{i,t} \tag{4}$$

where $Mature_{i,t}$ is a dummy variable that takes the value of one when a firm's listing duration is above the median in the country where the firm is incorporated (Kim and Michaely, 2019; Kim et al., 2018), and zero otherwise. To approximate the firms' public market age, we calculate the years since going public (*Listing Duration*). All other variables are defined as in Equation (1).

3.3.5   Operational Efficiency and Sensitivity to Investment and Employment Decisions

With respect to operational efficiency, we estimate the impact on alternative measures of operating performance by using *Operating Margin, Asset Turnover,* and *Labor Productivity* as dependent variable in Equation (4). Finally, we follow Kim and Michaely (2019) and use the sensitivity of investments (*CapEx*) and employment (*Employment Growth*) decisions to growth opportunities (*Tobin's Q*) as proxy for potential agency problems in a firm. For this, we estimate

the following regression equation:

$$Investments_{i,t} = \beta_1 Tobin's\ Q_{i,t} + \beta_2 Tobin's\ Q_{i,t} \times DCS_{i,t} + \beta_3 Cash\ Flow_{i,t} +$$
$$\varphi_{i,t} + \phi_{i,t} + \theta_{i,t} + \varepsilon_{i,t} \tag{5}$$

where for $Investments_{i,t}$ we use *CapEx* scaled by lagged total assets or *Employment Growth* rate relative to the previous year as proxy for the investment behavior, *Tobin's Q* as a measure for growth opportunities and *Cash Flow* as control variable. As we are interested in different effects of dual-class shares on corporate investments for young and mature firm, we split the sample into these two sub-groups. In addition, as the demand for downward adjustments is higher in firms with the lowest growth rates, our focus is on a sub-sample of the first quartile of sales growth.

4.   Empirical Analysis on Corporate Governance and Dual-Class Shares in Europe

We divide the presentation of our empirical findings for the different dual-class share structures in various sections grouped by regions consisting of countries with similar legal environments. In section 1, we discuss the results for multiple-voting shares in the Nordic countries, and in section 2 the results for the United Kingdom, which recently adjusted its dual-class shares regulation. We then focus on the findings for non-voting preference shares and multiple-voting shares in the southern European countries, in section 3. Finally, we discuss the special aspects of dual-class share structures in the German-speaking countries in section 4. Here the focus is on preference shares, which Austria and Germany only permits.

4.1 Multiple-Voting Shares in the Nordic Countries

4.1.1   The Nordic Corporate Governance Model and the Importance of Dual-Class Shares

Although the integration of the world economy and financial systems have contributed to a convergence of capital markets and corporate governance systems towards the Anglo-Saxon standards (Aggarwal et al., 2011), the Nordic corporate governance model still prevailed as a unique system (Thomsen, 2016; Ilmonen, 2015). One important feature is the pivotal role of controlling shareholders. Typically, they have sufficient economic incentives and instruments to take a long-term perspective, actively participating in the governance of their firms and creating value for all stakeholders (Lekvall et al., 2014; Skog and Lidman, 2016). The Nordic model yields significant power to the shareholders' meeting for controlling the board of directors and management (Lekvall, 2018).[31] In addition, the company law allows using various

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[31]   More specifically, the Nordic board structure has two tiers with some overlaps between the supervisory board

control-enhancing mechanisms, such as shares with multiple voting rights. This allows major shareholders to strengthen their governance role, which has been one of the key corporate governance characteristics (Bennedsen and Nielsen, 2010; Bjuggren and Palmberg, 2010; Holmén and Nivorozhkin, 2007; Becht and Boehmer, 2003, 1999; Cronqvist and Nilsson, 2003; LaPorta et al., 1999; Bergström and Rydqvist, 1992, 1990). Nevertheless, evidence for exploiting the private benefits of control at the expense of minority shareholders seems relatively minor (Dyck and Zingales, 2004; Nenova, 2003). Reasons are high investor protection and many effective 'extralegal' institutions (e.g. high tax compliance, low crime rates, media pressure, and labor unions), social norms, and the non-financial value of control (Ilmonen, 2015; Holmén and Knopf, 2004). In the Nordic countries, it is the common understanding that the combination of concentrated ownership and enhancement of control are a necessary pre-condition for the success of individual firms and the economy as a whole (Holmén and Högfeldt, 2004).

4.1.2 *Explanations for Decline of Dual-Class Shares in the Nordic Countries*

Despite all the well-documented advantages and success in the past, the number of listed firms with dual-class shares has declined in the Nordic countries (**Figures 1 and 2**). There are many possible explanations. *First*, under the pressure of the increasing influence of foreign institutional investors from the U.S. and U.K., dual-class firms themselves decided to adjust to the preferences and demands of these investors (Fogel et al., 2013; Henrekson and Jakobsson, 2012). In 1993, Finland and Sweden lifted the restrictions on foreign ownership (Norway followed in 1995), which suddenly put a relative valuation discount on Swedish dual-class firms (Holmén, 2011). *Second*, investors and the media perceived any mechanism that contributes to the entrenchment of the management and major shareholders with large skepticism after several corporate governance scandals in the beginning of this century (Lauterbach and Pajuste, 2017). *Third*, the harmonization of EU corporate governance regulation geared more toward the structure of the U.S. market-based system. This, however, is opposite to many fundamental characteristics of the historic Nordic corporate governance system (Ilmonen, 2015; Skog, 2004) and therefore substantial institutional pressure on dual-class firms emerged (Maury and Pajuste, 2011).[32] *Fourth*, the multiple considerations of the European Commission mandating a "one-share-one-vote" structure (2001, 2007) may have resulted in some anticipative actions.

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and executive management. Therefore, the board is not only restricted to the supervision of management, but also is responsible for running the business. In addition, employee co-determination in the form of representation on the supervisory board is optional and limited to one third of the board seats (Lekvall, 2018).

[32] For instance, the principle of equal treatment constituted in the EU Takeover Directive 2004 substantially lowers the economic incentives for large shareholders to take an active stance in the governance of publicly listed firms in the Nordic countries (Skog and Lidman, 2016).

Table 4: Descriptive Statistics

Variable	Nordic Countries			U.K.			Southern Countries		
	Single-Class mean	Dual-Class mean	Difference	Single-Class mean	Dual-Class mean	Difference	Single-Class mean	Dual-Class mean	Difference
Dependent Variables									
Tobin's Q	1.899	1.676	**0.223***	1.823	1.491	**0.333***	1.465	1.237	**0.228***
Return on Assets	-0.035	0.013	**-0.048***	-0.025	0.028	**-0.053***	0.011	0.016	-0.004*
Return on Equity	-0.112	-0.001	**-0.111***	-0.085	0.046	**-0.132***	-0.022	0.027	**-0.049***
Return on Sales	-0.868	-0.263	**-0.605***	-0.718	-0.016	**-0.702***	-0.13	0.006	**-0.135***
Return on Investments	-0.071	0.013	**-0.084***	-0.053	0.040	**-0.092***	0.007	0.025	**-0.018***
Firm-Level Controls									
ln(Total Assets)	11.657	12.218	**-0.561***	11.588	13.051	**-1.463***	12.43	14.612	**-2.181***
Leverage	0.232	0.242	**-0.009***	0.172	0.208	**-0.035***	0.241	0.295	**-0.054***
Tangibility	0.233	0.280	**-0.047***	0.268	0.426	**-0.158***	0.236	0.207	**0.030***
CapEx	0.042	0.046	**-0.004***	0.046	0.053	**-0.007***	0.040	0.035	**0.005***
R&D / Sales	0.016	0.016	0.001	0.020	0.008	**0.012***	0.011	0.007	**0.004***
Dividends	0.015	0.019	**-0.005***	0.018	0.020	**-0.002***	0.012	0.01	**0.002***
Cash	0.160	0.137	**0.023***	0.164	0.096	**0.068***	0.137	0.096	**0.041***
N	**15,531**	**7,260**	**22,791**	**34,191**	**1,172**	**35,363**	**31,438**	**2,753**	**34,191**

Variable	Switzerland			Austria			Germany		
	Single-Class mean	Dual-Class mean	Difference	Single-Class mean	Dual-Class mean	Difference	Single-Class mean	Dual-Class mean	Difference
Dependent Variables									
Tobin's Q	1.63	1.43	**0.200***	1.32	1.189	**0.131****	1.697	1.536	**0.160***
Return on Assets	0.018	0.035	**-0.017***	0.012	0.016	-0.004	-0.009	0.027	**-0.036***
Return on Equity	0.023	0.059	**-0.036***	-0.004	0.058	**-0.063****	-0.072	0.026	**-0.098***
Return on Sales	-0.228	0.007	**-0.235***	-0.144	0.061	**-0.205***	-0.256	-0.081	**-0.174***
Return on Investments	0.028	0.056	**-0.027***	0.018	0.04	-0.021	-0.034	0.039	**-0.073***
Firm-Level Controls									
ln(Total Assets)	13.428	13.472	-0.044	12.993	13.731	**-0.737***	11.854	13.043	**-1.189***
Leverage	0.224	0.224	-0.001	0.257	0.294	**-0.037***	0.197	0.23	**-0.033***
Tangibility	0.286	0.295	-0.009	0.311	0.264	**0.047***	0.220	0.326	**-0.106***
CapEx	0.036	0.038	-0.002	0.051	0.041	**0.010***	0.041	0.056	**-0.014***
R&D / Sales	0.024	0.016	**0.008***	0.008	0.001	**0.007***	0.017	0.01	**0.007***
Dividends	0.015	0.014	0.001	0.013	0.007	**0.006***	0.012	0.015	**-0.004***
Cash	0.153	0.156	-0.003	0.118	0.051	**0.067***	0.163	0.105	**0.058***
N	**4,474**	**1,296**	**5,770**	**1,796**	**341**	**2,137**	**16,639**	**2,088**	**18,727**

Notes: The table presents the univariate analysis. The sample includes publicly listed firms from 13 European countries between 1994 and 2020. *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

Overall, the dramatic decline in the private benefits of control relative to the valuation discount led to a lower attractiveness of dual-class shares for controlling shareholders. Next, we analyze the effects of dual-class shares on firm valuation and operating performance to evaluate the costs and benefits of shares with unequal voting rights in the Nordic countries.[33]

4.1.3 Descriptive Statistics on Differences in Firm Characteristics

We present the descriptive statistics of our sample in **Table 4**. As we are especially interested in firm characteristic differences between firms with and without shares with multiple voting rights, we divide our sample accordingly into two groups. Data sources, definitions and calculation principles of all our variables are contained in **Table 3**.

Nordic **single-class firms** are smaller (*Total Assets*) and have higher growth opportunities (*Tobin's Q*)[34] compared to Nordic **dual-class firms**, whereas dual-class firms are more profitable (*Return on Assets/Equity/Sales and Investments*). Moreover, dual-class firms have a higher leverage, more tangible assets, and invest more in capital expenditures (*CapEx*). They also have lower cash holdings and pay higher dividends, possibly aiming to mitigate the agency costs of the dual-class structure (Jordan et al., 2014).

4.1.4 Valuation Effects and Operational Performance of Multiple-Voting Shares

To determine whether there is a life-cycle effect, we focus on IPOs and analyze the valuation **(Figure 3 and Table A.1, Panels A)**[35] and performance difference between single- and dual-class firms over time (Cremers et al., 2020). For the average *Tobin's Q* and *Return on Assets* of single-class and dual-class firms relative to the time of the IPO, we observe that dual-class firms are, on average, lower valuated relative to firms in the sample of unmatched single-class firms. These results hold for the IPO and during the subsequent periods, supporting our **Hypothesis 1**. Consequently, firms with multiple-voting shares trade at a discount, possibly due to higher agency costs. Hence, majority investors extract some private benefits of control (Cremers et al., 2020) and implement effective anti-takeover devices (Bebchuk and Kastiel, 2019a). However, this close control results in a higher operating performance (RoA) of dual-class compared to single-class firms, which is in line with our **Hypothesis 2**.

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[33] In the Nordic countries, shares with multiple voting rights are the predominant form of dual-class shares.

[34] For the analysis of Tobin's Q, our measure assumes an equal price for all classes of shares (trading or non-trading), which follows Kim and Michaely (2019), Cremers et al. (2020) and Gompers et al. (2010). More specifically, for the market value of equity we used Refinitiv Datastream's variable Market Capitalization (WC08001) that multiplies the total number of shares outstanding (WC05301) with the year-end market price (WC05001) of the major share class in terms of market value and liquidity.

[35] We only included IPOs firms that went public during our sample period between 1994 and 2020.

Figure 3: Evolution of Tobin's Q and Return on Assets relative to the IPO year

Panel A: Nordic Countries
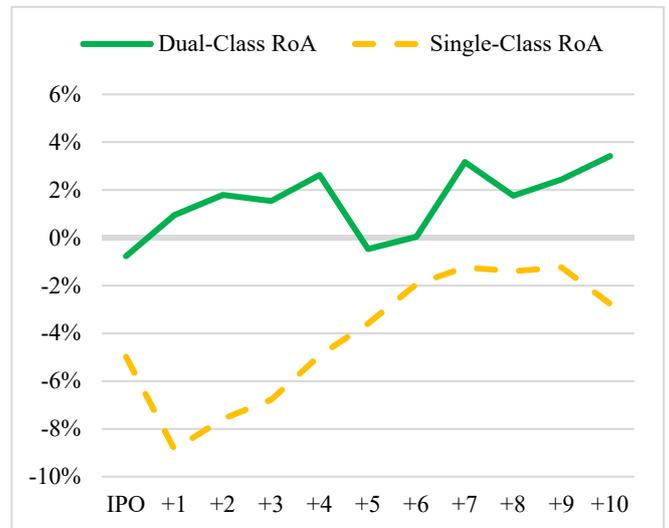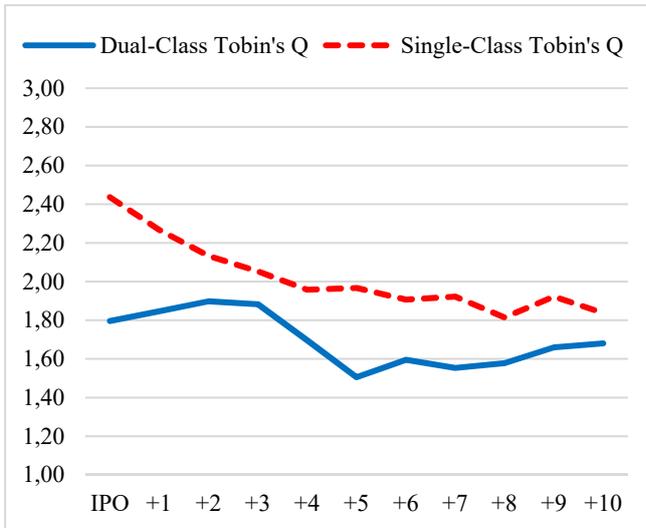
Panel B: U.K.
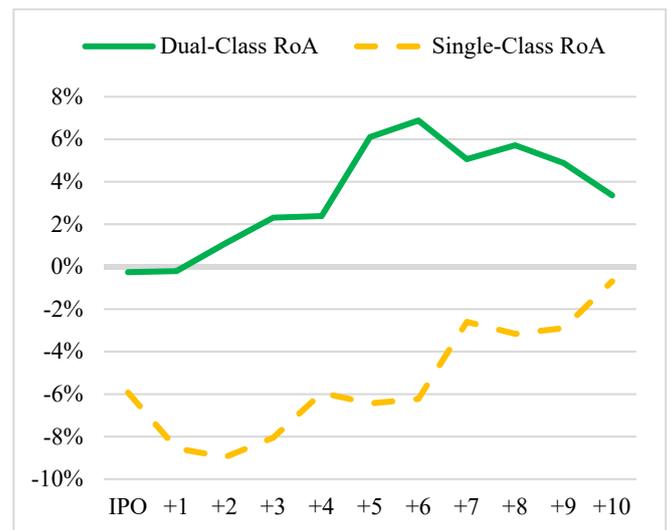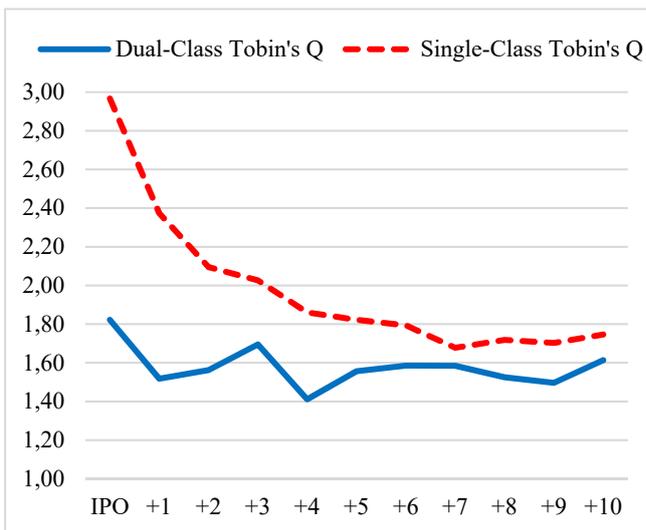
Panel C: Southern Countries
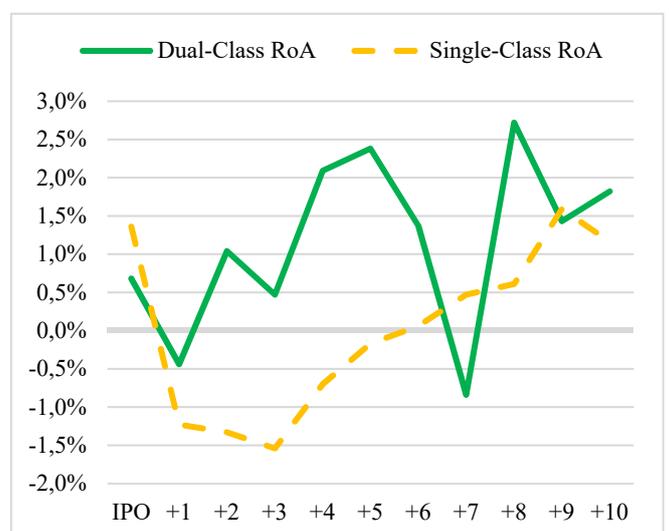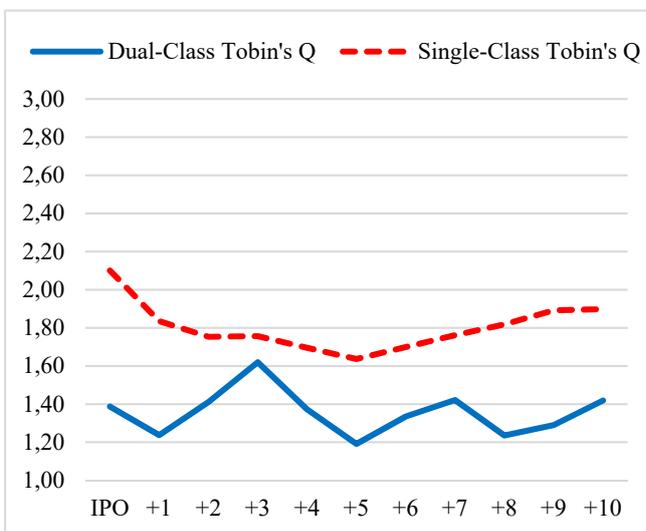
Panel D: Switzerland
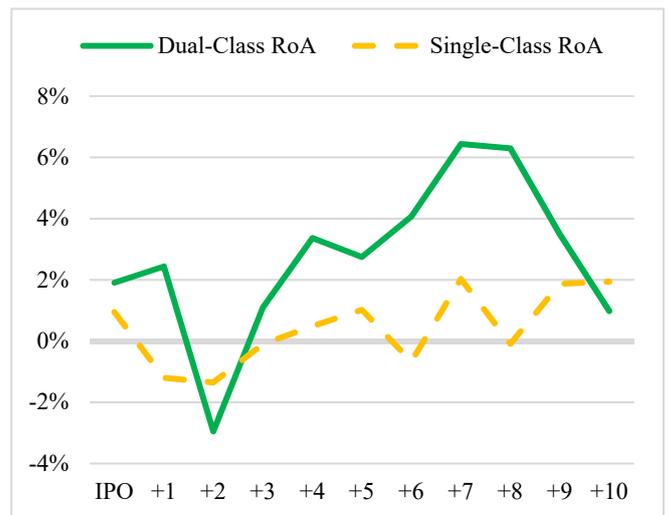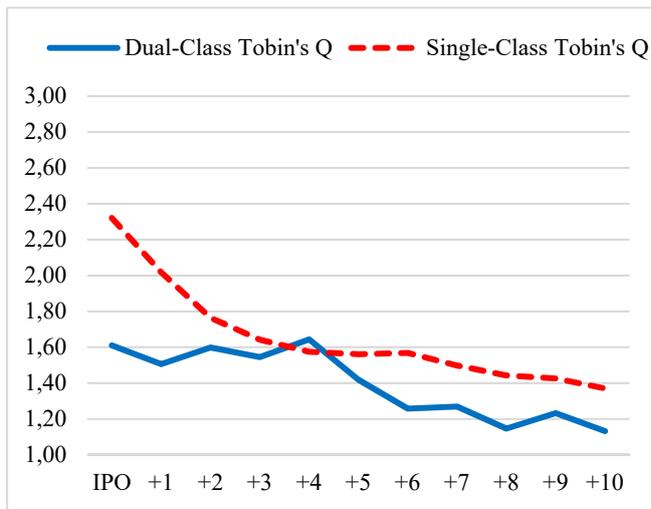
Panel E: Austria
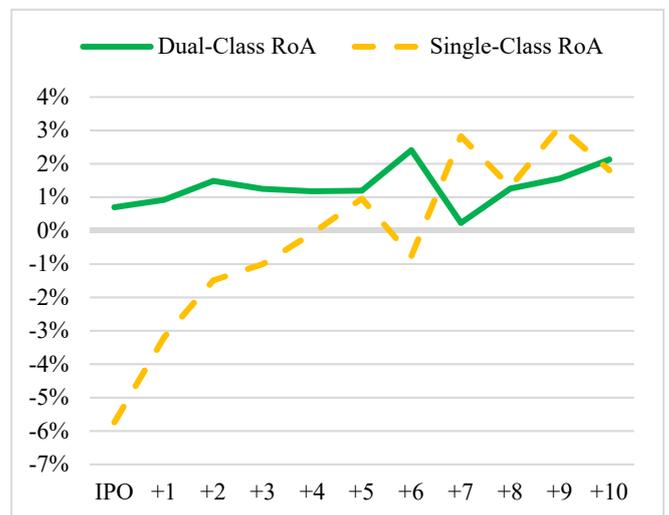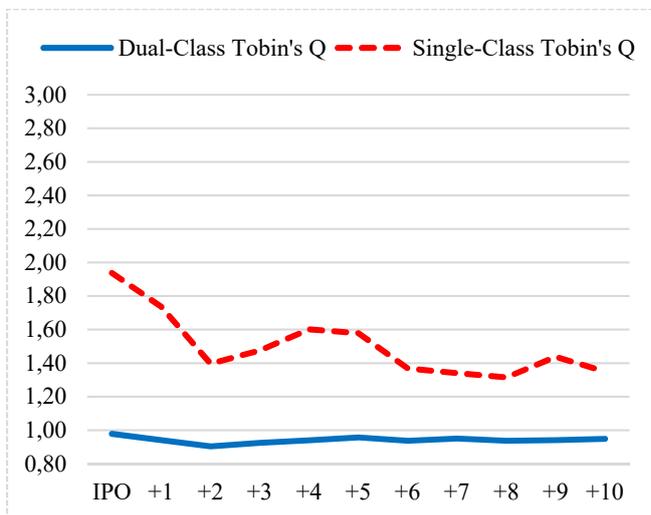
Panel F: Germany
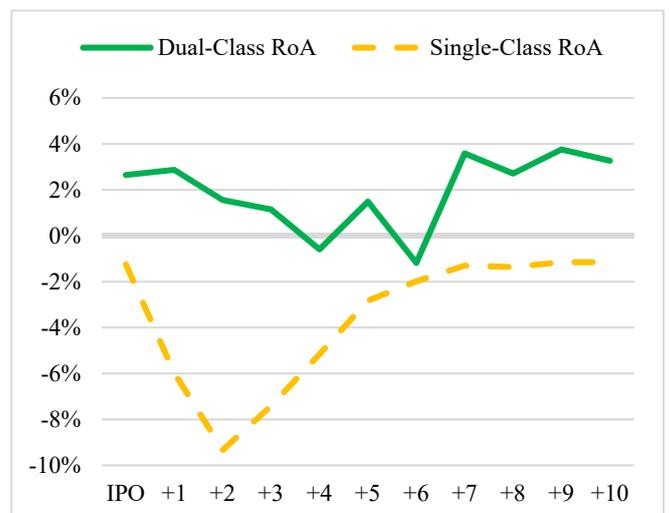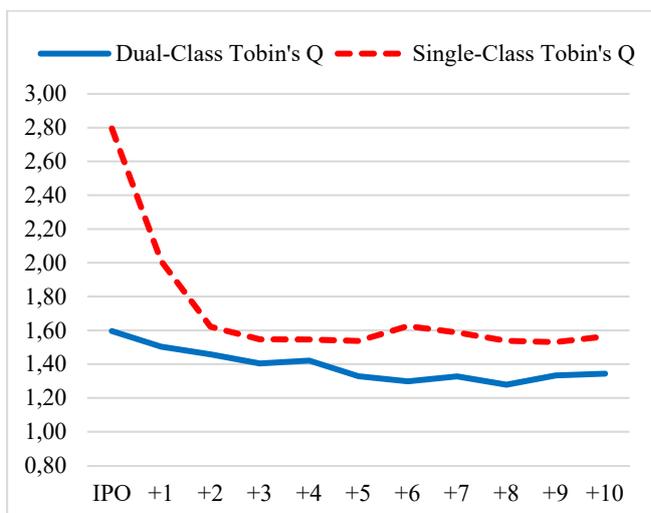
Notes: The figure presents the development of Tobin's Q and Return on Assets in years relative to the IPO by single- and dual-class firms. The sample includes publicly listed firms from 13 European countries that filed for an IPO between 1994 and 2020.

We next analyze in panel regressions the valuation effects and operational performance and employ *Tobin's Q*, *Return on Assets*, *Returns on Equity, Returns on Sales,* and *Returns on Investments* (Hettler and Forst, 2019) as the *Dependent Variable$_{i,t}$* (**Table 5**). We estimate our regression models for every single Nordic country and the region to obtain additional insights into the specific effects of dual-class shares. In column 1 of **Table 5, Panel A**, we report a negative and statistically significant effect of multiple-voting shares on firm value (*Tobin's Q*) for Denmark and Finland as well as for the Nordic countries as a region, consistent with **Hypothesis 1**. The profitability results are country-specific in the unmatched full data setting. More specifically, shares with multiple voting rights have a positive effect in Denmark (*Return on Sales*), Finland (*Return on Sales*), whereas they have a negative effect in Norway (*Return on Assets, Equity and Investments*). However, the coefficients for the Nordic region are positive (*Return on Assets* and *Sales*). Our control variables (unreported) have the same signs and similar statistical significance as in previous studies (Kim and Michaely, 2019; Bennedsen and Nielsen, 2010), and are available upon request.

In **Panel B**, we present the results for our matched sample for dual-class firms relative to single-class firms that are comparable by size (market capitalization) and industry affiliation (Fama-French 12 industries) in a given year. We find a statistically significant valuation discount (*Tobin's Q*) in Denmark, Finland, and Sweden, while the differences in operating performance vanish completely. We therefore provide supporting evidence for **Hypothesis 1** (valuation discount) in the Nordic countries. With respect to **Hypothesis 2** (stronger economic performance), our findings confirm the expectations for most Nordic countries and the region.

To investigate the argument that entrepreneurial high-growth firms with multiple-voting shares are more successful, we include a dummy for *High Growth* firms. For the Nordic countries as a region, the results indicate that the coefficients of these interaction terms are significantly positive for *Tobin's Q* and *Return on Assets* in the full sample (**Panels C and D, columns 1 and 2**). In the matched sample, only the coefficient for *Return on Assets* is significant, suggesting that innovative high-growth firms with dual-class shares outperform in the Nordic countries.

Table 5: Valuation Effects and Operating Performance of Dual-Class Shares

Panel A: Regional and Country-Specific Results - Full Sample

		Dual-Class Shares (DCS) Coefficients				
		I	II	III	IV	V
Dependent variable:	n	Tobin's Q	Return on Assets	Return on Equity	Return on Sales	Return on Investment
Nordic Countries	21,624	**-0.168***** [**-3.60**]	**0.009*** [**1.79**]	0.005 [0.34]	**0.202**** [**2.09**]	0.01 [0.97]
Denmark	4,444	**-0.220**** [**-1.99**]	0.010 [1.29]	0.004 [0.16]	**0.162*** [**1.71**]	0.011 [0.65]
Finland	3,379	**-0.233***** [**-3.97**]	0.001 [0.19]	-0.007 [-0.32]	**0.091*** [**1.92**]	0.000 [-0.03]
Norway	4,131	0.095 [1.28]	**-0.031***** [**-2.81**]	**-0.083**** [**-2.20**]	-0.19 [-0.99]	**-0.057***** [**-2.61**]
Sweden	9,670	-0.111 [-1.55]	0.003 [0.31]	-0.011 [-0.47]	0.148 [0.87]	-0.001 [-0.05]
German-Speaking Countries	26,258	-0.044 [-0.79]	**0.007**** [**2.35**]	0.015 [1.17]	-0.061 [-0.90]	0.01 [1.38]
Austria	1,890	0.168 [1.36]	0.002 [0.54]	**0.046*** [**1.88**]	0.04 [0.31]	0.014 [1.37]
Germany	18,634	-0.023 [-0.27]	0.007 [1.56]	0.01 [0.54]	-0.147 [-1.36]	0.008 [0.73]
Switzerland	5,734	-0.074 [-1.27]	0.005 [1.19]	-0.001 [-0.05]	0.081 [1.04]	0.004 [0.43]
Southern countries	32,874	0.033 [0.93]	**-0.008***** [**-2.80**]	-0.014 [-1.14]	-0.01 [-0.23]	**-0.019***** [**-2.60**]
Belgium	3,160	0.042 [0.57]	**-0.015*** [**-1.90**]	-0.024 [-1.07]	-0.205 [-1.30]	-0.02 [-1.37]
France	18,262	0.089 [1.42]	0.004 [0.71]	**0.035*** [**1.73**]	0.008 [0.11]	0.005 [0.35]
Italy	6,531	0.032 [0.57]	**-0.013**** [**-2.56**]	**-0.059**** [**-2.19**]	-0.025 [-0.49]	**-0.040**** [**-2.55**]
Portugal	1,380	0.129 [0.95]	-0.012 [-1.55]	-0.036 [-0.92]	-0.037 [-0.75]	-0.035 [-1.46]
Spain	3,541	-0.228 [-1.33]	-0.009 [-0.82]	**0.082*** [**1.83**]	-0.374 [-0.95]	0.009 [0.49]
U.K.	35,257	0.042 [0.67]	-0.004 [-0.46]	-0.026 [-0.95]	0.024 [0.20]	-0.017 [-0.92]
Controls Count., Ind., Year FE		yes no/yes	yes no/yes	yes no/yes	yes no/yes	yes no/yes

Panel B: Regional and Country-Specific Results - Matched Sample

		Dual-Class Shares (DCS) Coefficients				
		I	II	III	IV	V
Dependent variable:	n	Tobin's Q	Return on Assets	Return on Equity	Return on Sales	Return on Investment
Nordic Countries	8,920	**-0.215***** [**-3.82**]	0.008 [1.16]	0.008 [0.43]	0.141 [1.10]	0.008 [0.63]
Denmark	1,802	**-0.298**** [**-2.03**]	0.01 [0.79]	-0.021 [-0.64]	0.214 [1.00]	-0.004 [-0.19]
Finland	1,638	**-0.223***** [**-3.08**]	0 [0.01]	-0.013 [-0.54]	0.077 [1.04]	0.002 [0.10]
Norway	841	0.029 [0.50]	-0.006 [-0.53]	-0.02 [-0.57]	0.215 [1.00]	-0.005 [-0.24]
Sweden	4,639	**-0.270**** [**-2.53**]	0.015 [0.96]	0.035 [0.88]	0.021 [0.07]	0.018 [0.68]
German-Speaking Countries	6,998	-0.097 [-1.52]	**0.008**** [**2.36**]	0.01 [0.72]	-0.066 [-0.81]	0.012 [1.44]
Austria	604	0.073 [0.48]	0.011 [1.49]	**0.115**** [**2.20**]	0.109 [0.73]	**0.037**** [**1.98**]
Germany	4,356	-0.096 [-1.03]	**0.010*** [**1.91**]	0.001 [0.05]	-0.121 [-0.95]	0.011 [0.87]
Switzerland	2,038	**-0.148**** [**-2.02**]	0.00 [0.01]	-0.012 [-0.72]	0.001 [0.02]	-0.005 [-0.59]
Southern Countries	7,409	-0.035 [-1.01]	-0.004 [-1.36]	-0.017 [-1.31]	-0.008 [-0.16]	-0.013 [-1.62]
Belgium	913	-0.05 [-0.78]	0.00 [0.05]	0.006 [0.19]	0.073 [0.26]	0.008 [0.44]
France	3,264	-0.066 [-0.96]	0.007 [1.39]	0.01 [0.65]	**0.075*** [**1.95**]	0.004 [0.34]
Italy	2,060	0.019 [0.34]	**-0.016***** [**-2.64**]	**-0.075**** [**-2.53**]	**-0.078*** [**-1.67**]	**-0.050***** [**-2.63**]
Portugal	391	0.092 [1.12]	-0.007 [-0.87]	-0.04 [-0.83]	-0.047 [-0.98]	-0.034 [-1.13]
Spain	781	-0.313 [-1.60]	-0.007 [-0.89]	0.013 [0.28]	-0.306 [-0.76]	-0.004 [-0.18]
U.K.	6,025	-0.086 [-1.49]	0.011 [1.57]	0.018 [0.78]	**0.139*** [**1.80**]	0.015 [0.99]
Controls Count., Ind., Year FE		yes no/yes	yes no/yes	yes no/yes	yes no/yes	yes no/yes

Panel C: Full Sample - High Growth based on Top Tercile of Firm-Level Sales Growth

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA
Dual-Class Shares (DCS)	**-0.136*****	0.008	0.102	0.003	**0.065****	**-0.006***	**-0.061**	**0.010****	0.146	**0.005**	**-0.027**	0.010**
	[-3.10]	[1.55]	[1.60]	[0.32]	**[2.08]**	**[-1.92]**	**[-1.19]**	**[2.13]**	[1.40]	**[0.99]**	**[-0.32]**	[2.09]
High Growth	**0.331*****	**0.028*****	**0.203*****	**0.037*****	**0.186*****	**0.021*****	**0.295*****	**0.032*****	**0.110***	**0.024*****	**0.179*****	**0.040*****
	[10.43]	**[7.40]**	**[10.31]**	**[16.04]**	**[10.91]**	**[12.77]**	**[3.91]**	**[6.51]**	**[1.80]**	**[3.67]**	**[5.65]**	**[13.20]**
DCS * High Growth	**0.127****	**0.044*****	0.135	**0.023***	**0.144****	**0.009****	**0.176***	**0.023*****	0.355	**0.019*****	0.198	**0.040*****
	[1.97]	**[6.92]**	[1.61]	**[1.88]**	**[2.19]**	**[2.09]**	**[1.66]**	**[3.36]**	[1.53]	**[2.97]**	[1.52]	**[7.29]**
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country, Industry, Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.342	0.292	0.271	0.300	0.223	0.203	0.402	0.268	0.371	0.212	0.175	0.175
N	21,624	21,624	35,257	35,257	32,874	32,874	5,734	5,734	1,890	1,890	18,634	18,634

Panel D: Matched Sample - High Growth based on Top Tercile of Firm-Level Sales Growth

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA
Dual-Class Shares (DCS)	**-0.194*****	0.008	-0.031	**0.016****	-0.002	-0.004	-0.062	0.004	0.061	0.01	-0.089	**0.012****
	[-3.41]	[1.14]	[-0.53]	**[2.17]**	[-0.06]	[-1.20]	[-0.95]	[0.98]	[0.45]	[1.37]	[-0.96]	**[2.04]**
High Growth	**0.304*****	**0.028*****	**0.198*****	**0.035*****	**0.179*****	**0.012*****	**0.542*****	**0.025*****	**0.207****	**0.015****	**0.234*****	**0.030*****
	[4.58]	**[3.99]**	**[4.40]**	**[7.20]**	**[5.15]**	**[4.65]**	**[3.82]**	**[3.24]**	**[2.09]**	**[2.08]**	**[3.14]**	**[4.12]**
DCS * High Growth	0.091	**0.042*****	0.017	**0.040*****	0.077	**0.011*****	**0.193***	**0.016****	0.298	**0.025****	0.147	**0.041*****
	[1.28]	**[5.14]**	[0.22]	**[4.46]**	[1.21]	**[2.77]**	**[1.82]**	**[2.48]**	[1.22]	**[2.43]**	[1.10]	**[6.55]**
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country, Industry, Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.302	0.272	0.308	0.288	0.26	0.188	0.41	0.252	0.317	0.207	0.211	0.197
N	8,920	8,920	6,025	6,025	7,409	7,409	2,038	2,038	604	604	4,356	4,356

Notes: The table presents our results from OLS regressions on *Tobin's Q* and *Return on Assets* as the dependent variables. Panel A (B) reports the country and regional specifics results in the full data set (matched sample) setting. In Panel C and D, we are interested in high and low-growth firms, where *High Growth* equals one if a firm is in the top tercile based on sales growth in the given year. The sample includes publicly listed firms from 13 European countries between 1994 and 2020. Our main variable of interest is the dummy for *Dual-Class Shares,* which takes the value of one when the firm issued share classes in a given year. For reason of space, we do not report the coefficients of the controls. We control for country, industry and year effects, and report t-values based on robust standard errors clustered at firm-level in parentheses. *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

4.1.5   Channels via which Multiple-Voting Shares Impact the Firms

We are also interested in the channels through which shares with multiple voting rights affect the valuation discount and superior operating performance. For this analysis, we estimate the moderating effects of founding families and firm age as well as the impact on operational efficiency and investment sensitivity.

We begin with the effects of founding families on valuation and operating performance of dual-class firms for the shorter period from 2007 to 2016. In **Table 6, Panels A and B, column 1**), the results indicate that single-class firms under the control of a founding family have a lower firm valuation (*Tobin's Q*), suggesting a general discount of family ownership in the Nordic countries. In contrast, pure family control is positively associated with the operational performance (RoA). Interestingly, multiple-voting shares have a negative effect on the valuation of non-family firms, while the effect is insignificant in family firms. This contrasts with previous evidence from European (Bennedsen and Nielsen, 2010) and Swedish studies (Cronqvist and Nilsson, 2003), and leads to a rejection of **Hypothesis 3**. Overall, our results reveal that Nordic family firms with multiple-voting shares do not experience an even larger valuation discount or lower economic performance due to agency conflicts resulting from ownership concentration and control-enhancing mechanisms.[36] This finding could result from the special social relationships in the Nordic countries between family ownership and employees.

We now investigate the valuation and performance effects over the firms' life cycle, with a particular interest on the interaction effects with shares with multiple voting rights in the Nordic countries. We present the results of the life-cycle effect in **Table 7**. In **column 1 of Panel A and B**, we find that mature firms trade at a valuation discount, which is, however, lower in mature firms with multiple-voting share structures. Thus, we do not find supporting evidence for our **Hypothesis 4** in this analysis, which contrasts the theoretical predictions of Bebchuk and Kastiel (2017) and empirical evidence of Cremers et al. (2020) and Kim and Michaely (2019) for the U.S. Again, this result might be due to country-specific peculiarities such as the social responsibilities and interaction between all stakeholders in the Nordic countries, which we do not observe in the U.S.

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[36] In the *Appendix*, we also present the effects of other controlling shareholders (**Table A.2**).

Table 6: The Role of Founding Family Control in Dual-Class Firms

Panel A: Full Sample - Founding Family Firm

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA
Single-Class Founding Family	0.01	**0.033***	0.062	**0.047***	-0.032	**0.023***	0.097	0.001	-0.085	0.014	-0.061	**0.029***
	[0.11]	**[1.95]**	[0.81]	**[5.06]**	[-0.83]	**[6.93]**	[0.74]	[0.05]	[-0.76]	[1.34]	[-0.78]	**[3.86]**
Dual-Class Founding Family	0.445	0.019	**0.511***	0.029	-0.078	0.006	-0.603***	0.034	0	0	-0.015	0.011
	[1.27]	[0.45]	**[5.72]**	[0.77]	[-0.95]	[0.40]	**[-3.00]**	[1.50]	[.]	[.]	[-0.09]	[0.80]
Dual-Class Non-Founding Family	-0.039	0.010	0.143	-0.011	0.081	-0.007	-0.138	-0.002	0.317	0.007	0.484	-0.004
	[-0.36]	[0.82]	[1.10]	[-0.51]	[1.16]	[-1.17]	[-1.04]	[-0.18]	[1.40]	[0.57]	[1.26]	[-0.28]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.353	0.28	0.285	0.307	0.254	0.217	0.468	0.365	0.411	0.231	0.172	0.152
N	5,490	5,490	10,922	10,922	10,897	10,897	1,529	1,529	581	581	5,655	5,655

Panel B: Matched Sample - Founding Family Firm

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA
Single-Class Founding Family	**-0.265***	**0.045****	**0.274***	**0.047****	-0.087	**0.020***	0.349	0.009	0.073	0.026	0.027	**0.039***
	[-1.79]	**[2.54]**	**[1.68]**	**[2.32]**	[-1.24]	**[3.64]**	[1.36]	[0.79]	[0.84]	[1.09]	[0.16]	**[3.75]**
Dual-Class Founding Family	0.298	0.006	**0.439****	**0.027***	**-0.163***	0.008	-0.885***	0.01	0	0	-0.031	0.019
	[0.84]	[0.15]	**[2.12]**	**[1.74]**	**[-2.07]**	[0.65]	**[-2.77]**	[0.38]	[.]	[.]	[-0.18]	[1.49]
Dual-Class Non-Founding Family	**-0.192***	0.018	0.062	0.004	0.015	0	-0.134	0.004	0.175	0.022	0.453	-0.003
	[-1.66]	[1.27]	[0.48]	[0.23]	[0.20]	[0.07]	[-1.09]	[0.35]	[0.56]	[1.44]	[1.02]	[-0.19]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.353	0.254	0.325	0.311	0.358	0.268	0.583	0.439	0.65	0.506	0.232	0.211
N	1,365	1,365	1,679	1,679	2,047	2,047	297	297	105	105	746	746

Notes: The table presents our results from OLS regressions on *Tobin's Q* and *Return on Assets* as the dependent variables. Panel A and B report the results for the full data set and matched sample. Our main variable of interest is the dummy for *Dual-Class Shares,* which takes the value of one when the firm issued share classes in a given year, which is used for the combinations with *Founding Family:* Ultimate owner is an individual person or a family that is the founder or related by blood or marriage to one of the founders. The sample includes publicly listed firms from 13 European countries between 2007 and 2016. For reason of space, we do not report the coefficients of the controls. We control for country, industry and year effects, and report t-values based on robust standard errors clustered at firm-level in parentheses. *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

Table 7: The Interaction between Dual-Class Shares and the Corporate Life Cycle

Panel A: Full Sample

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		**U.K.**		**Southern Countries**		**Switzerland**		**Austria**		**Germany**	
Dependent variable:	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA
Dual-Class Shares	**-0.245*****	0.011	-0.002	-0.019	0.044	-0.007	-0.107	0.006	0.228	0.012	**-0.184*****	**0.016***
(DCS)	**[-3.66]**	[1.34]	[-0.02]	[-1.50]	[0.57]	[-1.26]	[-1.20]	[0.77]	[0.81]	[1.49]	**[-2.63]**	**[1.76]**
Mature	**-0.235*****	**0.009***	**-0.318*****	**0.008****	**-0.217*****	**0.006*****	**-0.132****	-0.001	**-0.131***	**0.016****	-0.013	**0.027*****
	[-5.50]	**[1.78]**	**[-11.80]**	**[2.52]**	**[-8.93]**	**[2.95]**	**[-1.99]**	[-0.24]	**[-1.92]**	**[2.57]**	[-0.30]	**[6.39]**
DCS * Mature	**0.140***	-0.003	-0.001	0.023	0.019	-0.004	0.081	-0.005	-0.064	-0.015	**0.351****	-0.014
	[1.85]	[-0.34]	[-0.01]	[1.39]	[0.23]	[-0.58]	[0.72]	[-0.53]	[-0.26]	[-1.47]	**[2.47]**	[-1.46]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.346	0.289	0.279	0.295	0.232	0.199	0.396	0.263	0.383	0.212	0.175	0.17
N	19,169	19,169	34,440	34,440	31,823	31,823	5,285	5,285	1,802	1,802	18,135	18,135

Panel B: Matched Sample

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		**U.K.**		**Southern Countries**		**Switzerland**		**Austria**		**Germany**	
Dependent variable:	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA	Tobin's Q	RoA
Dual-Class Shares	**-0.262****	-0.002	**-0.176****	-0.006	-0.009	-0.007	**-0.285****	-0.003	0.216	**0.026***	**-0.229****	0.015
(DCS)	**[-2.56]**	[-0.23]	**[-2.05]**	[-0.53]	[-0.13]	[-1.24]	**[-2.43]**	[-0.41]	[0.70]	**[1.77]**	**[-2.44]**	[1.21]
Mature	**-0.276*****	-0.005	**-0.307*****	-0.008	**-0.143*****	-0.002	**-0.326*****	-0.005	-0.127	**0.025***	-0.017	**0.019*****
	[-3.32]	[-0.42]	**[-6.50]**	[-1.40]	**[-4.14]**	[-0.80]	**[-2.70]**	[-0.84]	[-1.32]	**[1.83]**	[-0.24]	**[2.66]**
DCS * Mature	0.066	0.02	0.081	**0.028****	0.014	0.002	0.237	0.002	-0.185	-0.027	**0.271****	-0.009
	[0.58]	[1.46]	[0.70]	**[1.99]**	[0.18]	[0.35]	[1.47]	[0.21]	[-0.66]	[-1.46]	**[2.01]**	[-0.72]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.323	0.262	0.310	0.287	0.272	0.183	0.399	0.273	0.337	0.225	0.213	0.189
N	7,060	7,060	5,652	5,652	6,842	6,842	1,711	1,711	549	549	3,947	3,947

Notes: The table presents results from OLS regressions on *Tobin's Q* and *Return on Assets* as the dependent variables. Panel A (B) reports the results for the life cycle effect and its interaction with dual-class shares structures in the full data set (matched sample) setting. Our main variable of interest is the dummy for *Dual-Class Shares,* which takes the value of one when the firm issued share classes in a given year. *Mature* equals one if a firm's listing duration is above the median in the country where the firm is incorporated (Kim and Michaely, 2019; Kim et al., 2018). The sample includes publicly listed firms from 13 European countries between 1994 and 2020. For reason of space, we do not report the coefficients of the controls. We control for country, industry, and year effects and report t-values based on robust standard errors clustered at firm-level in parentheses. *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

Next, we estimate the impact on alternative measures of operating performance conditional on the maturity of the firm by using *Operating Margin, Asset Turnover,* and *Labor Productivity* as dependent variable in Equation (4) in **Table 8**. The presumption is that dual-class shares are associated with increasing agency costs, which a decline in operational efficiency should reflect (Kim and Michaely, 2019).

Our results indicate that *Dual-Class Shares* and *Mature* have a positive (negative) effect on the operating margin (labor productivity) in the Nordic region. In contrast, the coefficients for the *Dual-Class Shares * Mature* interaction term are insignificant, which suggests that multiple-voting shares have no impact on this relationship. **Hypothesis 5** predicts an increase of agency costs reflected in lower operational efficiency of dual-class firms over time. Our findings support the hypothesis for the Nordic countries. Therefore, the evidence does suggest at least partially a detrimental effect of shares with multiple voting rights on operational efficiency throughout this region.

It is also important to examine the sensitivity of investments (*CapEx*) and employment (*Employment Growth*) decisions to growth opportunities (*Tobin's Q*) of a dual-class firm (Kim and Michaely, 2019). In **Table 8, Panel C, columns 1 to 4**, our results reveal a negative coefficient for the *Dual-Class Shares * Tobin's Q* interaction term for slow-growing firms with respect to *Capex* in the Nordic countries, albeit statistically insignificant. Therefore, our results for the Nordic countries do not support the notion that dual-class firms are associated with higher agency problems (higher downward adjustments costs), which again may reflect the common understanding and trust between the various stakeholder groups in the Nordic countries that dual-class shares are a prerequisite for the long-term success of the firm.

Overall, our findings indicate that one characteristic of dual-class firms in the Nordic countries is a lower valuation. However, they are more profitable than single-class firms. Moreover, multiple-voting shares are particularly beneficial for high-growth firms, for which capital markets assess a valuation premium. These findings are consistent with the results for the U.S. (Hettler and Forst, 2019; Kim and Michaely, 2019; Cremers et al., 2020; Jordan et al., 2016). Finally, we observe that founding families, firm maturity and downward adjustment costs do not have explanatory power for explaining the valuation and operating performance effects of dual-class shares in the Nordic countries. This may indicate that there are relatively less pronounced agency problems than in other countries.

Table 8: Channels How Dual-Class Shares Impact the Valuation Effects and Operating Performance

Panel A: Full Sample

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII
	Nordic Countries			U.K.			Southern Countries			Switzerland			Austria			Germany		
Dep. variable:	OM	AT	LP	OM	AT	LP	OM	AT	LP	OM	AT	LP	OM	AT	LP	OM	AT	LP
Dual-Class Shares	**0.237***	-0.012	-0.08	-0.043	**0.255***	-0.233	-0.009	**-0.101****	**-0.302***	**0.183***	0.016	-0.128	0.15	**-0.238***	0.222	-0.028	0.098	-0.147
	[1.88]	[-0.30]	[-1.34]	[-0.23]	**[-3.38]**	[-1.63]	[-0.16]	**[-2.48]**	**[-3.99]**	**[1.75]**	[0.20]	[-1.43]	[1.04]	**[-2.31]**	[1.21]	[-0.25]	[1.48]	[-1.64]
Mature	**0.300***	0.009	-0.038	**0.271***	0.002	**-0.067***	**0.069***	**-0.036***	**-0.124***	0.04	**0.106***	0.034	**0.242***	**-0.168***	**0.199***	**0.135***	0.006	**-0.131***
	[3.62]	[0.37]	[-0.93]	**[5.30]**	[0.07]	**[-2.35]**	**[2.67]**	**[-2.04]**	**[-3.89]**	[0.43]	**[1.94]**	[0.48]	**[1.97]**	**[-2.26]**	**[2.09]**	**[2.42]**	[0.20]	**[-3.18]**
DCS * Mature	-0.126	-0.019	-0.041	0.071	0.081	0.125	-0.022	0.07	0.139	**-0.227***	-0.15	-0.011	-0.248	**0.269***	0.069	-0.095	**-0.206***	0.142
	[-0.95]	[-0.41]	[-0.61]	[0.34]	[0.72]	[0.73]	[-0.32]	[1.46]	[1.48]	**[-1.82]**	[-1.48]	[-0.09]	[-1.47]	**[2.11]**	[0.30]	[-0.81]	**[-2.59]**	[1.34]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.15	0.409	0.281	0.197	0.335	0.267	0.135	0.396	0.3	0.162	0.496	0.445	0.068	0.499	0.426	0.07	0.319	0.31
N	18,514	17,400	15,633	33,502	30,022	28,550	30,409	28,655	26,137	4,755	4,947	4,439	1,653	1,631	1,460	17,118	16,395	14,862

Panel B: Matched Sample

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII
	Nordic Countries			U.K.			Southern Countries			Switzerland			Austria			Germany		
Dep. variable:	OM	AT	LP	OM	AT	LP	OM	AT	LP	OM	AT	LP	OM	AT	LP	OM	AT	LP
Dual-Class Shares	-0.024	-0.01	**-0.170***	0.071	**0.256***	**-0.332***	-0.027	-0.077	**-0.273***	0.091	0.071	-0.142	0.034	**-0.267***	0.159	-0.036	0.105	-0.022
	[-0.14]	[-0.18]	**[-1.96]**	[0.75]	**[-3.32]**	**[-2.37]**	[-0.50]	[-1.54]	**[-3.50]**	[1.08]	[1.02]	[-1.33]	[0.37]	**[-2.15]**	[0.74]	[-0.24]	[1.42]	[-0.21]
Mature	0.048	-0.028	**-0.134***	0.084	**-0.068***	**-0.133***	0.021	-0.029	**-0.100***	0.044	**0.183***	0.09	**0.166***	-0.116	-0.024	0.099	0.025	-0.092
	[0.28]	[-0.59]	**[-1.75]**	[1.08]	**[-1.81]**	**[-2.73]**	[0.73]	[-1.08]	**[-2.15]**	[0.62]	**[3.01]**	[0.91]	**[2.02]**	[-1.22]	[-0.17]	[1.24]	[0.53]	[-1.31]
DCS * Mature	0.252	0.024	0.087	0.026	0.08	0.175	-0.028	0.055	0.095	**-0.148***	**-0.185***	-0.093	-0.139	0.202	0.141	-0.024	**-0.225***	0.093
	[1.14]	[0.36]	[0.90]	[0.19]	[0.72]	[1.04]	[-0.46]	[1.05]	[0.98]	**[-1.73]**	**[-1.99]**	[-0.68]	[-1.37]	[1.47]	[0.62]	[-0.17]	**[-2.49]**	[0.77]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.124	0.413	0.287	0.172	0.37	0.339	0.033	0.462	0.323	0.11	0.491	0.504	0.191	0.66	0.45	0.07	0.435	0.361
N	6,929	6,609	6,186	5,530	4,880	4,754	6,485	6,156	5,890	1,551	1,595	1,472	480	491	472	3,686	3,541	3,328

Panel C: First Quartile of Sales Growth

	I	II	III	IV	V	VI	VII	VIII
	Nordic Countries				**U.K.**			
Dependent variable:	CapEx		Employment Growth		CapEx		Employment Growth	
	Young	*Mature*	*Young*	*Mature*	*Young*	*Mature*	*Young*	*Mature*
Tobin's Q	0.002	0.001	**0.043***	**0.020***	**0.003***	**0.004***	**0.025***	**0.018***
	[1.57]	[1.43]	**[5.73]**	**[2.67]**	**[3.80]**	**[5.86]**	**[5.96]**	**[3.56]**
DCS * Tobin's Q	-0.001	-0.002	-0.015	0.005	0.004	0.003	-**0.064***	-0.019
	[-1.09]	[-1.33]	[-1.64]	[0.72]	[0.76]	[0.89]	**[-2.72]**	[-1.36]
Cash Flow	**0.018***	**0.037***	0.041	0.074	**0.020***	**0.053***	**0.110***	**0.108***
	[2.78]	**[5.96]**	[0.74]	[1.57]	**[4.00]**	**[10.47]**	**[3.41]**	**[3.38]**
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.135	0.181	0.062	0.023	0.097	0.149	0.065	0.066
N	1,606	2,586	1,305	2,235	2,935	4,635	2,592	4,431

	IX	X	XI	XII	XIII	XIV	XV	XVI
	Southern Countries				**Switzerland**			
Dependent variable:	CapEx		Employment Growth		CapEx		Employment Growth	
	Young	*Mature*	*Young*	*Mature*	*Young*	*Mature*	*Young*	*Mature*
Tobin's Q	0.001	0.002	**0.031***	0.008	-0.001	0.005	**0.031***	0.011
	[0.53]	[0.97]	**[4.60]**	[1.04]	[-0.86]	[1.31]	**[4.01]**	[0.81]
DCS * Tobin's Q	-0.001	0.003	**-0.045***	**-0.034****	0.001	-0.003	-0.029	0.024
	[-0.27]	[1.19]	**[-1.84]**	**[-2.26]**	[0.38]	[-0.81]	[-1.40]	[1.55]
Cash Flow	**0.039***	**0.065***	**0.217***	**0.180****	**0.040***	0.028	0.189	**0.344***
	[3.59]	**[5.65]**	**[4.78]**	**[2.57]**	**[3.52]**	[1.24]	[1.47]	**[1.70]**
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.05	0.09	0.046	0.022	0.176	0.255	0.162	0.152
N	2,514	3,769	2,054	3,316	496	599	404	538

	XVII	XVII	XIX	XX	XXI	XXII	XIII	XXIV
	Austria				**Germany**			
Dependent variable:	CapEx		Employment Growth		CapEx		Employment Growth	
	Young	*Mature*	*Young*	*Mature*	*Young*	*Mature*	*Young*	*Mature*
Tobin's Q	-0.001	-0.01	**-0.028***	0.011	0.001	-0.001	0.013	0.006
	[-0.22]	[-0.83]	**[-1.67]**	[0.24]	[1.03]	[-0.76]	[1.42]	[1.04]
DCS * Tobin's Q	0.027	-0.009	-0.125	**0.058***	0.002	-0.001	-0.032	0.004
	[1.53]	[-0.93]	[-1.37]	**[1.73]**	[0.52]	[-0.93]	[-1.36]	[0.33]
Cash Flow	**0.056****	**0.115***	0.237	0.184	**0.034***	**0.058***	**0.150***	0.063
	[2.56]	**[2.00]**	[0.58]	[0.41]	**[4.69]**	**[5.25]**	**[3.03]**	[1.12]
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.441	0.339	0.234	0.346	0.073	0.114	0.082	0.033
N	147	186	117	164	1,868	2,444	1,584	2,116

Notes: The table presents results from OLS regressions on *Operating Margin (OM), Asset Turnover (AT)* and ln of *Labor Productivity (LP)* (Panel A to B) as well as *CapEx* and *Employment Growth* (Panel C) as the dependent variables. Panel C reports the effects of dual-class shares on capital investments and employment conditional on growth opportunities and firm maturity. It analyzes a subset of firms with sales growth in the first quartile. Our main variable of interest is the dummy for *Dual-Class Shares,* which takes the value of one when the firm issued share classes in a given year. *Mature* equals one if a firm's listing duration is above the median in the country where the firm is incorporated (Kim and Michaely, 2019; Kim et al., 2018). The sample includes publicly listed firms from 13 European countries between 1994 and 2020. For reason of space, we do not report the coefficients of the controls. We control for country, industry, and year effects and report t-values based on robust standard errors clustered at firm-level in parentheses. *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

4.2 Multiple-Voting Shares in the United Kingdom

The use of dual-class shares in the U.K. were allowed since long (Megginson, 1990), but declined many decades ago due to the valuation discount relative to firms with single share classes (Braggion and Giannetti, 2019). Most importantly, institutional investors view the dual-class share construction critically and therefore firms did not extensively use them. However, the competition from the U.S. and from Asian financial centers, Brexit, and the decline in the number of IPOs changed the perspective in the U.K., resulting in some new legislation. In this section, we analyze the valuation and performance effects for a sample of dual-class shares in the U.K.[37]

4.2.1   Descriptive Statistics on Differences in Firm Characteristics

We present the characteristics of firms with and without dual-class shares for the U.K. in **Table 4, column 2**. As for other European countries, we find a lower firm valuation (*Tobin's Q*) but higher profitability (*Return on Assets/Equity/Sales* and *Investment*) for dual-class firms. This finding supports our **Hypotheses 1 and 2**. Moreover, dual-class firms are larger (*Total Assets*), have a higher leverage, and possess more tangible assets. Interestingly, firms with multiple-voting shares invest more in capex but less in R&D. Finally, our results reveal that dual-class firms have less cash holdings but pay higher dividends, possibly to mitigate the agency problems from this voting structure. These findings may result from the observation that dual-class firms in the U.K. are older firms that went public long ago. Therefore, these firms do not fit well into the current discussion that focusses on the benefits of shares with multiple voting rights for high-growth start-up firms in which the owner, inventor or entrepreneur has a comparative advantage that may lead to a financial and operating outperformance for its shareholders.

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[37] Shares with multiple voting rights are the most relevant form of dual-class shares in the U.K.

4.2.2   Valuation Effects and Operating Performance of Multiple-Voting Shares

During our sample period 1994-2020, only few IPOs in the U.K. used dual-class shares. However, for the firms which did, we compare the yearly development of *Tobin's Q* and *Return on Assets* of dual-class with single-class IPOs in **Figure 3 and Table A.1, Panels B**, and observe a lower firm valuation for dual-class firms at the time of the IPO and in subsequent years. Interestingly, the differences narrow over time. In contrast, firms using shares with multiple voting rights at the IPO reveal a higher economic performance. This is consistent with the idea that founders, innovators and entrepreneurs initially are able to generate a longer-term outperformance. Our findings are consistent with the **Hypotheses 1 and 2**.

In **Table 5,** we present the results from panel regressions in which we control for country-, industry- and country-specific characteristics and time-varying factors. For the full data sample (**Panel A**), we do not find neither a positive nor a negative effect of multiple-voting shares on firm valuation and on operating performance. In the matched sample (**Panel B**), we observe a positive coefficient for *Return on Sales* with low statistical significance (10% level). The results in **Panels C and D (column 3-4)** suggest that even high-growth firms with multiple-voting shares, despite having a superior operating performance, are not higher valued. Therefore, our results only provide supporting evidence for **Hypothesis 2.**

4.2.3   Channels via which Multiple-Voting Shares Impact the Firms

Next, we investigate for the U.K. the mechanisms through which shares with multiple voting rights affect firm performance. We start with the role of controlling shareholders (**Table 6, columns 3-4**). Interestingly, **Panels A and B** indicate a positive effect of founding families on *Tobin's Q* and *Return on Assets* in general. The effect is even stronger for family firms with multiple-voting shares. This is in contrast to the general notion that family firms do exploit the private benefits of control, resulting in negative agency costs effects, especially when ownership concentration and dual-class structure occur jointly (**Hypothesis 3**). This finding lends again support to the idea that founders, innovators and entrepreneurs have a comparative advantage, which enables them to generate abnormal operating and financial performance, at least for some time. However, with a long-term commitment and perspective from owners in managing their enterprise, they should be aware that exploiting benefits of control might only yield short-term gains. Moreover, it might damage their reputation, and when it comes to raising additional funds via bank loans (higher interest rates) or equity (lower share price when issuing additional equity; SEO), the cost of capital could be higher. The critical perception of institutional investor may have contributed to these results in the U.K., which also reflects the half-hearted recent reforms in the U.K.

To examine whether these advantages persist or decay over time, we analyze the life-cycle effects of shares with multiple voting rights. We present the results in **Table 7** and observe that mature firms trade in general at a valuation discount, whereas multiple-voting shares provide no additional explanatory power in this context. This contrasts with our **Hypothesis 4** on the increase of agency problems of dual-class shares over time. Again, the above arguments may apply here as well.

Finally, we analyze the difference in operational efficiency between single- and dual-class firms. Consistent with our **Hypothesis 5**, we find that *Asset Turnover* and *Labor Productivity* is lower in firms with multiple-voting shares (**Table 8, Panels A and B**). Finally, we are interested in the sensitivity of dual-class firms to investment opportunities. In **Panel C, column 7**, our results reveal a negative coefficient for the *Dual-Class Shares * Tobin's Q* interaction term in slow-growing and young firms with respect to employment growth. This support our **Hypothesis 6** on the higher agency problems associated with shares with multiple voting rights, which at least partially explains the negative valuation effects.

Overall, the relative share of dual-class firms in the U.K. has declined over many decades and is relatively low nowadays. Reasons for this are the opposing views and intensive lobbying of institutional investors, as well as the restriction to lower-ranked listing segments of the LSE (*Standard Main Market* and *AIM*). Based on the final recommendations of the U.K. Listing Review (2021), the U.K. revised its listing rules and permitted shares with multiple voting rights in the *Premium Main Market* segment of the LSE in December 2021. However, the reform attaches several restrictions to the issuance of multiple-voting shares and therefore fails to attract large entrepreneurial high-tech firms such as in the U.S. (Reddy, 2022). An important aspect is the five-year limitation of the dual-class shares structure, which will probably discourage founders from listing in the premium segment. As the successful implementation of their unique vision and strategy requires a long-term commitment and perspective, a pre-determined period appears less sensible. Moreover, the superior leadership skills and technological expertise of entrepreneurs do not disappear after a certain period and vary at the firm level. Consequently, the recent reform will most likely not result in an increase in dual-class listings of high-growth firms in the U.K., but renders the market less attractive relative to other market places. To have any positive impact on attracting new listings, reforms require a structural break with the past.

4.3 Dual-Class Shares in the Southern European Countries and Belgium

In contrast to the Nordic countries, the development of dual-class shares followed a different path in some other countries, mostly initiated by the governments, in that loyalty shares

advanced as the favored construction and classical US style shares with multiple voting rights only take a minor role. In this section, we investigate the differences in valuation and operating performance of dual-class firms in France, Italy, Portugal, Spain, and Belgium.

4.3.1   Introduction of Loyalty Shares and Multiple-Voting Shares

Academics (Bolton and Samama, 2013) and regulators (EU, 2020b) suggested the broader use of loyalty shares for listed companies in some countries. The idea is that this should limit the short-termism demands of capital markets and reward long-term "loyal" investors by giving them extra votes when they holding shares continuously longer than a pre-specific period.[38] Relative to shares with multiple voting rights, the main advantages of loyalty shares are often stated as follows (ECGI, 2018): (1) Only one class of shares and one market price exists, facilitating index inclusion. (2) The investor has the voting privilege in lieu of the share and it is not perpetual because the extra votes are non-transferable[39]. (3) They limit the disproportionality of ownership-control structures through restricted vote multipliers. In contrast, the disadvantages discussed are (4) loyalty shares are less transparent, (5) the registration process is too complicated and administrative burdensome for institutional investors. Some countries followed these arguments and introduced loyalty shares during the last decade.

4.3.2   Institutional Background on Loyalty Shares in Europe

In France, the Florange Act (*Loi Florange*), enacted on March 29, 2014, offers double voting right when the investor holds shares for at least two years (Becht et al., 2020; Bourveau et al., 2022). Before, listed companies already had the opportunity to use loyalty shares with a two third majority of shareholder votes (*opt-in rule*).[40] This provision reversed in that shareholders now have to vote for preserving the "one-share-one-vote" structure with a two-third majority (*opt-out rule*). In Italy, companies can use both types of shares with multiple voting rights. The Competitiveness Decree No. 91 of June 24, 2014 (*Decreto Competitivitá*) introduced both classes of shares, shares with multiple voting rights and loyalty shares. Although only firms when going public are allowed to issue multiple-voting shares (with a maximum of three votes per share), firms that are already publicly listed may employ loyalty shares with a double voting after a holding period of two years (Sandrelli and Ventoruzzo, 2018; Santoro et al., 2015;

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[38]   Moreover, possible rewards are additional rights such as warrants, bonus dividend, bonus shares, or a reduced capital gains tax rate (Quimby, 2013). For a more skeptical view on loyalty shares to promote more long-termism in U.S. firms, see Roe and Venezze (2021).

[39]   With some exceptions varying between the countries such as donations, inheritance and mergers without change in ultimate control (Mosca, 2019).

[40]   As of 13 November 1933, the French law maker prohibited shares with multiple voting rights, but as compensation allowed that shareholders of French nationality can obtain double voting rights after a holding period of at least two years (Conanc, 2005), which was the exception throughout Europe for many decades.

Ventoruzzo, 2015). However, the adoption of loyalty shares is not the default rule and therefore requires a two-third shareholder majority (*opt-in rule*). With similar arrangements, Belgium implemented on January 1, 2020 (Mosca, 2019) the new Code of Companies and Associations that allows loyalty shares. In Spain, the Law No. 5/2021 (April 21, 2021) permitted loyalty shares (Garcia de Enterria, 2022). Finally, the Netherlands already allow loyalty shares programs but they mostly become only visible in takeovers.

4.3.3 *Empirical Evidence on the Effects of Loyalty Shares*

One consequence associated with the *Loi Florange* in France is a change in ownership structure. The long-term oriented foreign institutional investors reduced their investments in firms that automatically changed their voting structure from "one-share-one-vote" to the double voting system, while the ownership of controlling individuals and families increased (Bourveau et al., 2022; Becht et al., 2020), indicating who disliked these changes and who benefitted from them. Supporting the arguments of the opposing institutional investors, firms that rejected the default adoption of loyalty shares experienced significantly higher stock returns and firm value. However, Belot et al. (2019) observe negative market reactions for firms that announced to opt out. With respect to IPOs, the question is whether loyalty shares incentivized some firms to go public that otherwise would have stayed private. Becht et al. (2020) find that the relative share of firms going public with loyalty shares increased from 50.0% to 61.4%, albeit the difference is statistically insignificant. For the *Decreto Competitivitá* in Italy, Bajo et al. (2020) reports that firms with a controlling family shareholder are most likely to introduce loyalty shares, whereas institutional investors have not reduced their holdings. Moreover, their results do not indicate any significant valuation effects associated with the introduction of loyalty shares. Finally, Mio et al. (2020) find that firms with loyalty shares decreased earnings management, which suggests a lower exposure to short-termism.

Overall, the empirical evidence indicated an increase in ownership concentration and control among family shareholders and blockholders after the adoption of loyalty shares. For institutional investors this seems less beneficial, as they usually engage less in corporate control (often using proxy advisor firms on their voting decisions) and may have little interest in registering their shares and doubling their voting rights. Moreover, there is no evidence of positive performance effects, which investors may prefer. Overall, there exists no clear evidence whether loyalty shares are a beneficial mechanism to limit short-termism and encourage a long-term shareholder value perspective. Since we are mainly interested in the valuation and operating performance of classical dual-class firms in Europe, we next focus in our own empirical

analysis only on non-voting preference shares and multiple-voting shares in the Southern countries.[41]

4.3.4 Descriptive Statistics on Differences in Firm Characteristics

The different characteristics between firms with and without preference shares from the Southern countries we present in **column 3 of Table 4**. Our results reveal, on average, a valuation discount (*Tobin's Q*) for firms with unequal voting shares, which confirms our **Hypothesis 1**. In line with **Hypothesis 2**, we find a higher economic performance as measured by *Return on Equity, Sales* and *Investments*. Moreover, dual-class firms are larger (*Total Assets*), have more debt, and less fixed assets. In contrast to the notion that preference shares protect the management from short-term pressure of capital markets in favor of a long-term focus and the founder's idiosyncratic vision, we find that dual-class firms invest less in capex and R&D. This also suggests that more established firms in southern European countries, which went public a long time ago, use preference shares and should be distinguished from the current discussion on multiple-voting shares for entrepreneurial high-tech firms with highly innovative and skilled founders and owners.

4.3.5 Valuation Effects and Operating Performance of Non-Voting Preference Shares

In **Figure 3 and Table A.1, Panels C**, we investigate the yearly development of *Tobin's Q* and *Return on Assets* for single- and dual-class IPOs. We observe that firms with unequal voting structures trade at a valuation discount at the time of the IPO and the following years, which supports our **Hypothesis 1**. In contrast, preference shares exhibit a higher operating performance (*Return on Assets*) relative to "one-share-one-vote" structures, which is again consistent with **Hypothesis 2**.

Our results from the panel regressions suggest that dual-class firms have neither a valuation discount nor premium relative to single-class firms in the Southern countries and region (**Table 5**). We find inconclusive evidence for the effects of preference shares on operating performance. More specifically, our results suggest a negative effect on *Return on Assets* in Belgium and Italy where also *Return on Equity* and *Investments* are lower. In contrast, France and Spain have higher *Returns on Equity*, albeit weakly significant. However, the effects for the Southern countries as a region are negative with respect to *Return on Assets* and *Investments*.

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[41] In the southern European countries, controlling shareholders predominantly employ loyalty shares and non-voting preference shares as a form of dual-class shares. Recently, shares with multiple voting rights were introduced in Italy (2014) and Portugal (2022), but only four Italian firms used them so far. Loyalty shares with double voting rights advanced in Belgium (2020), France (2014), Italy (2014) and Spain (2021). As there exists already sufficient empirical literature with critical conclusions, we exclude them from our own empirical analysis.

In the matched sample, we confirm our previous results for France and Italy. Finally, preference shares are beneficial in entrepreneurial firms with high-growth opportunities, as they reveal a higher profitability and a valuation premium (**Panels C and D, columns 5-6**). This finding is in contrast to the empirical evidence for loyalty shares and somewhat inconsistent with the notion that multiple-voting shares are more attractive for start-ups firms.

4.3.6 *Channels via which Non-Voting Preference Shares Impact the Firms*

We now explore the potential channels via which preference shares have an impact on firm valuation and operating performance. We begin with the moderating role of founding families using non-voting preference shares as control-enhancing mechanism. We observe that the pure family control increases *Return on Assets* (**Table 6, columns 5-6**), while family firms with preference shares have a lower firm valuation in the Southern region (**Panel B**). This supports our **Hypothesis 3**, expecting a higher valuation discount in firms controlled by founding families. With respect to life-cycle effects, our results reveal that mature firms in general are lower valued but are more profitable in the Southern region (**Table 7, columns 5-6**). However, preference shares provide no additional explanatory power, leading to rejecting **Hypothesis 4**.

Next, we analyze the impact of non-voting preference shares on alternative operating performance measures and present the results in **Table 8 (columns 7-9)**. In line with our **Hypothesis 5**, Southern firms with unequal voting rights have a lower asset turnover and labor productivity, suggesting a poorer operational efficiency that possibly translates into the valuation discount. To obtain more insights into the agency problems of dual-class firms, we perform an analysis that estimates the sensitivity of investment and employment decisions to growth opportunities. In **Panel C**, **columns 11-12**, we find a negative and significant coefficient for the *Dual-Class Shares * Tobin's Q* interaction term in slow-growing firms with respect to employment growth. Therefore, our results support the notion that preference shares are associated with higher agency problems in the Southern region, which is consistent with our **Hypothesis 6**.

Overall, our own empirical analysis for southern European countries indicates that dual-class firms trade neither at a valuation discount nor at a premium. However, the effects on operating performance are mixed. While firms with non-voting preference shares are less profitable in Belgium and Italy, they outperform in France and Spain. Our analysis of the mechanisms via which these voting structures affect firm outcomes reveals that agency problems arising from concentrated founding family ownership, lower operational efficiency and higher downward adjustment costs are more severe in dual-class firms. Therefore, our results indicate that non-voting preference shares do not offer much benefit in the Southern European countries. As

previous studies suggest that loyalty shares are also less advantageous when it comes to bringing entrepreneurial high-tech start-up firms to the public equity markets, shares with multiple voting rights remain as an alternative solution. Even though Italy (2014) and Portugal (2022) permits multiple-voting shares for IPOs, firms too rarely use them to provide sufficient data for reliable conclusions.

4.4 Dual-Class Shares in the German-Speaking Countries

The German-speaking countries Austria and Germany are unique within Europe, as they have remarkably different dual-class share structures, containing distinct features relative to the Nordic and the Southern European countries as well as to the U.S. and to Asian countries. Switzerland as the third country is different as it permits shares with multiple voting rights and is therefore comparable to the Nordic countries and U.K. Consequently, we expect similar empirical findings. In contrast, Austria and Germany do not allow multiple-voting shares but instead permit **preference shares** as the only dual-class share structure. This structure grant firms the right to issue two different kinds of shares, voting shares securing one vote and non-voting shares with preferential rights attached. These serves as a compensation for giving up the voting right. Often this preference is a "preferred" higher dividend relative to the voting shares. Therefore, any comparison across European countries is challenging requiring a careful and differentiated analysis. Due to these major differences, we present and discuss all country-specific findings in separate sections (Switzerland, Austria and Germany). As before, we present the descriptive statistics and analyze the differences in firm characteristics, valuation effects and operating performance. We also discuss the channels through which dual-class shares affect firms. Finally, we draw several conclusions for each German-speaking country based on our findings for the different dual-class share structures.

4.4.1 Analysis for Switzerland

Comparing previous studies for Switzerland reveals that the earlier empirical evidence for multiple-voting shares in Switzerland is rather inconclusive. Nüesch (2016) reports that shares with multiple voting rights neither increase nor decrease the financial and operational performance, while the effect is positive for firms that require higher external financing. In contrast, Schmid (2009) documents a valuation discount for firms with dual-class share structures. From our own analysis of multiple-voting shares in Switzerland, we first report the univariate differences in characteristics between single-class and dual-class firms in **Table 4, column 4**. Compared to single-class structures, shares with multiple voting rights experience a valuation discount at the market (*Tobin's Q*), but generate a higher operating performance (*Re-*

turn on Assets/Equity/Sales/Investments). Moreover, Swiss dual-class firms spend less on research and development (*R&D*). This may result from the fact that many established firms implemented multiple-voting shares long ago and therefore this group is different from entrepreneurial high-tech start-up firms, which are the focus of the current discussion, and which domestic stock exchanges aim to attract. In **Figure 3 and Table A.1**, we detail the development of *Tobin's Q* and *Return on Assets* along the firms' life cycle after the IPO. Our results in **Panels D** indicate that dual-class IPOs experience a valuation discount relative to single-class IPOs, supporting our **Hypothesis 1**. With respect to profitability*,* dual-class firms have higher *Return on Assets* in every year following the IPO, which is in line with **Hypothesis 2**. The estimates of the panel regressions for the valuation and operating performance effects appear in **Table 5, Panels A and B**. Consistent with our **Hypothesis 1**, we find for firms with multiple-voting shares a lower *Tobin's Q*. However, the coefficients are insignificant across all operating performance measures. For high-growth firms with multiple-voting shares, we observe a higher profitability, which the capital market rewards with a valuation premium (**Panels C and D, columns 7-8)**.

We next investigate how the potential interaction of dual-class shares with other variables affect the firm valuation and economic performance in Switzerland. One important aspect is the role of family ownership in dual-class firms. Our results in **Table 6, columns 7-8,** indicate that founding families with multiple-voting shares are lower valued in Switzerland supporting **Hypothesis 3**. Moreover, we find that mature firms are also lower valued, while dual-class shares structures provide no additional explanatory power in this context (**Table 7, columns 7-8)**. With respect to operational efficiency, we observe a lower operating margin and asset turnover in mature firms with multiple-voting shares (**Table 8, Panels A and B, column 10-12**), which may at least partially explain the valuation discount and is consistent with **Hypothesis 5**. We report the results from the investment-sensitivity analysis to growth opportunities in **Panel C, columns 13-16**. Our findings do not suggest that mature and slow-growing dual-class firms suffer from greater agency problems resulting from higher downward adjustment costs.

Overall, our results for Switzerland suggest that firms with multiple-voting shares trade at a valuation discount, while their operating performance is similar to firms without these voting structures. Most importantly, our analysis provides new evidence for Switzerland that dual-class firms controlled by founding families experience an even lower firm valuation, possibly due to the extraction of private benefits of control at the expense of other shareholders. Moreover, we observe that multiple-voting shares are associated with lower operational efficiency.

Therefore, agency problems arising from ownership concentration and management inefficiencies may provide the most likely explanations for the valuation discount of multiple-voting shares in Switzerland.

4.4.2 Analysis for Austria

Austria allows the issuance of **non-voting preference shares** as compensation for giving up the voting rights with additional dividend payments. Our results for the valuation and operating performance effects of these preference shares structures are as follows. The descriptive statistics for Austria **(Table 4, column 5)** indicate that firms with preference shares trade at a valuation discount but are more profitable as measured by *Return on Equity* and *Sales*. Moreover, they have a lower tangibility, invest less in capex and R&D, and pay less dividends. IPO firms issuing voting common shares and non-voting preference shares are lower valued (*Tobin's Q*) in the years subsequent to the IPO, whereas they are more profitable (*Returns on Assets*) **(Panels E of Figure 3 and Table A.1)**. These observations support both **Hypotheses 1 and 2**. Our panel regressions results (**Table 5**) reveal that dual-class firms experience neither a valuation discount nor a premium, while the coefficient for *Return on Equity* and *Investments* is positive. This indicates a superior operating performance of dual-class shares in Austria relative to "one-share-one-vote" structures and is in line with our **Hypothesis 2**. Interestingly, we observe for high-growth firms with preference shares that they are even more successful as measured by *Return on Assets*, which again supports the notion that a dual-class share structure can be beneficial for some firms. However, the coefficient for *Tobin's Q* is insignificant **(Panels C and D, columns 9-10)**.

The findings for founding families in Austria reveal that neither pure family control nor family firms with preference shares provide statistically significantly superior results **(Table 6, columns 9-10)**. For the life cycle effects in Austria, we find that mature firms in general trade at a valuation discount but are more profitable (**Table 7, columns 9-10**). However, preference shares do not provide additional explanatory power. We also observe that dual-class firms have a lower asset turnover, supporting our **Hypothesis 5** on the operational efficiency (**Table 8, Panels A-B, columns 13-15**). With respect to agency problems resulting from higher downward adjustment costs, there exists neither a higher nor a lower investment-sensitivity to growth opportunities in Austrian firms with preference shares (**Panels C-D, columns 17-20**).

Overall, our empirical findings reveal that dual-class firms have a higher operating performance and similar firm valuations relative to single-class firms. In this context, founding family ownership, firm age, and agency problems are not relevant factors that affect firms with

dual-class share structures. Therefore, non-voting preference shares are not associated with negative effects for firm outcomes in Austria.

4.4.3   Analysis for Germany

Germany introduced a different legal structure for dual-class shares at the turn of the millennium. Whereas the U.S. and the Nordic countries allow dual-class shares with multiple voting rights and the southern European countries use loyalty shares as their standard, Germany does not permit multiple-voting shares and loyalty shares. Instead, it only admits a preference share structure as described in the introduction of this section.[42] However, the use of preference shares declined from a high of 128 firms in 1994, as many companies unified their different share classes to remain included in one of the major German stock indices (Betzer et al., 2017; Daske, 2019).[43] In 2020, there were only 32 firms left with this voting structure.[44] It is therefore important to discuss our empirical findings in the context of preference shares of already established firms. Previous empirical research indicates that preference shares have a lower firm valuation and operational performance relative to single-class shares in Germany (Ehrhardt and Nowak, 2015). Moreover, the price difference between voting common shares and non-voting preference shares is positive, with private benefits of control and market liquidity as important determinants of this voting right premium (Fatemi and Krahnen, 2000). In this study, we provide new evidence for Germany on the valuation effects and operational performance of preference shares.

We begin with our univariate results for dual-class firms. Comparing the characteristics of dual-class to single-class structures, we report the differences in **column 6 of Table 4** and find that firms with non-voting preference shares are associated with a valuation discount (*Tobin's Q*), whereas they generate a higher operating performance (*Return on Assets/Equity/Sales/Investments*). In addition, they are larger (*Total Assets*), have a higher leverage, more tangible assets, invest more in capex, spend less for R&D, have lower cash holdings, and pay higher dividends. As we detail in **Figure 3 and Table A.1, Panels F**, dual-class IPOs issuing

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[42]   German dual-class firms are mostly traditional family firms that went public during the 1980s and 1990s. At that time, IPO firms had an average age of more than 60 years and the reason for going public was to raise additional equity while keeping control within the family (Thies, 2000; Daske, 2019).

[43]   Since 2002, the calculation of the index weighting for major stock indices in Germany (DAX family) uses the market capitalization of the free float and therefore favors more liquid shares. However, either the voting common share or the non-voting preference share is included in the index, but not both. For this reason, many dual-class firms converted to single-class firms to increase their free float and index weighing.

[44]   In the *Appendix*, we present the long-term development of firms with preference shares in Germany (**Figure A.3**). For many decades, non-voting preference shares were less important until the 1980s, when a large number of family firms went public using this voting structure. However, the number of preference shares declined continuously since 1996 (Daske, 2019).

preference shares trade at a valuation discount but are more profitable (*Return on Assets*) than single-class IPOs in the first years after going public, which is consistent with **Hypotheses 1 and 2**. We present the estimations of the panel regression results in **Table 5, Panels A and B,** which suggest neither a higher nor a lower valuation of dual-class firms in Germany (*Tobin's Q*). With respect to operating performance, we find a significantly positive effect of preference shares on *Return on Assets*, which confirms our **Hypothesis 2**. For firms with high growth opportunities, we observe that preference shares are even more beneficial and outperform single-class structures (**Panels C and D, columns 11-12**). Therefore, the panel regressions confirm our univariate results.

Next, we analyze the mechanisms through which preference shares affect the firm valuation and operating performance. We start with the effects of founding family ownership and find that family control has a positive effect on operational performance (*Return on Assets*) in general (**Table 6, columns 11-12**). Interestingly, dual-class firms controlled by founding families have neither a valuation premium nor discount (*Tobin's Q*) and have a similar operating performance. With respect to the corporate life-cycle effects (**Table 7, columns 11-12),** our findings suggest that dual-class firms experience a general valuation discount, which is lower for mature firms, but generate a superior operating performance. Therefore, our evidence for mature dual-class firms remains inconclusive (**Hypothesis 4).** For the operational efficiency of preference shares in Germany (**Table 8, Panels A-B, columns 16-18**), our results reveal a lower asset turnover for mature dual-class firms, which is consistent with our **Hypothesis 5**. Finally, the estimates from the investment-sensitivity analysis to growth opportunities appears in **Table 8, Panels C-D, columns 21-24**. Our findings do not indicate that, on average, German firms with preference shares are associated with higher downward adjustments costs and have therefore higher agency problems compared to single-class firms.

Overall, our results for Germany reveal that firms with preference shares have neither a valuation discount nor premium, but a superior operating performance relative to single-class firms. Interestingly, high-growth firms with dual-class shares are even more successful. In this context, agency problems from concentrated ownership of founding families or higher downward adjustments costs do not have a significant impact. Finally, we do not observe any time-variant life cycle effects, which would have suggested that established firms with preference shares have higher agency costs. Nevertheless, the unique features of German style dual-class shares are hardly comparable to multiple-voting shares used by entrepreneurial high-tech firms, which are currently at the center of the policy and academic debate. The typical argument nowadays is that they are essential to protect the founder's idiosyncratic vision and abilities. Instead,

it seems that firms with preference shares in Germany are older and in general mainly trying to avoid capital market control by dominating the board and the annual general meeting. This usually also precludes undesirable takeover attempts and activist shareholder attacks.

5. Discussion of the Empirical Results

5.1 Summary of our Findings

Overall, our empirical analysis indicates that the effects of dual-class-shares on firm valuation and operating performance are regional and country-specific. This finding is in accordance with the earlier conclusion in a study for the European Union by Adams and Ferreira (2008), who do not find that the "one-share-one-vote" principal is significantly superior in all circumstances and therefore should not become the only permitted structure within Europe. Moreover, consistent with the evidence provided in U.S. studies, we do not find that dual-class firms trade at a general valuation discount. For countries allowing multiple-voting shares in Europe, we find a valuation discount for Danish, Finnish, Swedish, as well as Swiss dual-class firms (*Tobin's Q*), while they positively affect the operating performance (*Return on Assets/Equity/Sales and Investments*) in Denmark, Finland, and U.K. In contrast, the results for preference shares in Austria and Germany are insignificant. Independent of the specific dual-class structure, we detect for Europe that the superior voting rights are particularly beneficial for high-growth firms, as capital markets reward them with a valuation premium. This is consistent with the recent results for the U.S. (Hettler and Forst, 2019; Kim and Michaely, 2019; Cremers et al., 2020 and Jordan et al., 2016). However, there is also evidence for a negative association between dual-class shares and profitability in Norway and Italy, which may depend on other country-specific factors and seems unrelated to the multiple-voting share and preference share structures per se.

Our analysis of how unequal voting rights affect the firm valuation and operating performance in Europe indicates country-specific firm outcomes. We find that founding family ownership amplifies the negative relationship in Switzerland and Southern Europe, which allow multiple-voting shares and preference shares, respectively. Regardless of the legal structure of dual-class shares, operational inefficiencies have some explanatory power for the negative valuation effects. In contrast to the findings for dual-class IPOs in the U.S. (Cremers et al., 2020; Kim and Michaely, 2019), our results do not provide support for the notion that agency problems increase when firms mature and therefore the benefits of any dual-class share structure decline. Finally, dual-class firms with multiple-voting shares (U.K.) and preference shares

(Southern countries) are associated with higher downward adjustment costs. In **Table 9**, we provide an overview of our hypothesis tests.

Table 9: Summary of Hypotheses Tests

	H1: Valua-tion	H2: Profit-ability	H3: Family Control	H4: Maturity	H5: Op. Effi-ciency	H6: Agency Costs
Nordic Countries	✓	✓	n.s.	✗	✓	n.s.
U.K.	n.s.	✓	✗	n.s.	✓	✓
Southern Countries	n.s.	✗	✓	n.s.	✓	✓
Germany	n.s.	✓	n.s.	✗	✓	n.s.
Austria	n.s.	✓	n.s.	n.s.	✓	n.s.
Switzerland	✓	n.s.	✓	n.s.	✓	n.s.

Notes: The table presents the summary of our hypotheses tests, where ✓ denotes support for the hypothesis, ✗ denotes rejection of the hypothesis and n.s. denotes not significant results.

5.2 Discussion of Recent Developments in different Countries

5.2.1 Current State in the U.S.

Whether the value of the firm increases by separating ownership and control is open for debate, but evidently, some investors favor greater voting rights, whereas others prefer a larger share of future cash distributions. Founders typically strive to possess the majority of the votes after going public, as they are the driving force behind ideas, innovation, success, and outper-formance of the firm. Investors, at least initially and for some time may agree and benefit from this proposition, but may get upset during times of poor performance when they cannot enforce control. Consequently, investors view unequal voting structures sometimes as beneficial and at other times as detrimental.[45] As policy makers have to react to extreme situations by imple-menting regulations, we observe periods with and without dual-class shares in the U.S.[46] and periods with increasing and declining numbers in other countries.

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[45] The quote at the beginning of this article by Andrew Hill expresses this conflict very well.

[46] The U.S. introduced dual-class shares first in 1898, later on banned them in 1926, and finally permitted them again in 1994, as all U.S. stock exchanges agreed on specific rules for dual-class shares (Lel et al., 2021; Howell, 2017).

This debate has resulted in substantial theoretical and empirical research with period dependent outcomes. Some theoretical research argues that dual-class shares create substantial agency problems between management and shareholders (Grossman and Hart, 1988; Harris and Raviv, 1988; Bebchuk and Kastiel, 2017) due to the separation of ownership and control. Consequently, the earlier evidence suggests that dual-class firms usually trade at a valuation discount relative to single-class firms (Gompers et al., 2010; Smart et al., 2008; Cronqvist and Nilsson, 2003). In contrast, recent studies argue in favor of dual-class shares for young and high-growth firms, as they postulate that the greater insights, superior leadership and technological skills of the founder, inventor or entrepreneur create abnormally high additional value for shareholders (Jordan et al., 2016; Chemmanur and Jiao, 2012).[47] In the U.S., the most recent empirical evidence clearly indicates, on average, a higher operational performance of dual-class firms, which also translates into a valuation premium in the years subsequent to the IPO (Cremers et al., 2020; Kim and Michaely, 2019). Overall, for innovative start-up companies the odds have flipped again this time in favor of dual-class shares. However, to support this notion for Europe, it is essential to provide sufficient empirical evidence by analyzing different countries or regions separately.

5.2.2 Current State in Selected European Countries

Europe instituted country-specific regulation with respect to dual-class shares. In the Nordic countries (Sweden, Denmark, Finland, and Norway), management and investors appreciated multiple-voting shares for many decades. However, foreign (mainly U.S.) institutional investor demanded adjustments which changed the Nordic corporate governance model in the 1990s, resulting in a drastic decline of dual-class shares since then. This trend may have reversed recently as the benefits or the expectations of unicorn IPOs in particular find some support. The southern European countries (France, Italy and Spain) share a different perspective on the optimal allocation of cash flow and voting rights. They allocate these rights according to the length of the investors' investment period. As the preference is for "loyal" long-term shareholders, such as families and the government, they receive double voting rights over time. For inventors and entrepreneurs with a clear strategic vision this structure is less appealing.[48]

Germany constitutes another example of how to allocate cash flow and voting rights with dual-class shares. German style preference shares are structured in such a way that one

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[47] For the entrepreneur, the benefit of shares with multiple voting rights is that holding only **9.1%** of the shares is sufficient to secure the majority of the votes. However, these votes are usually not transferable.

[48] If the entrepreneur favors holding the majority of the votes, it is necessary to own **33.4%** of the shares facing substantial economic exposure. This restricts external financing and therefore limits growth, as it depends on the ability of the founder to keep 33.4%% of the shares after each financing round.

group has one vote per share, whereas the other group has no-votes but often receives a pre-ferred dividend for giving up the voting power. Obviously, this allocation creates substantial agency problems, as this structure allows insiders to dominate and manage the firm without significant outside interventions. Since there is hardly any capital market control leading to takeovers attempts or shareholder activism attacks, the effects could be detrimental for non-voting investors as evidenced by the many scandals at Volkswagen AG (Barth et al., 2022; Allen et al., 2021; Elson et al., 2015). From an international corporate governance perspective, non-voting preference shares seem very outdated, and entrepreneurial firms nowadays do not employ them when going public in Germany.[49] The same holds for alternative legal structures such as the limited partnership with shares (KGaA)[50], which circumvents some disadvantages of preference shares while keeping control of the founders over the company.[51] Currently, there are only 24 firms listed with this legal construction and 32 firms with preference shares. How-ever, after disallowing shares with multiple voting rights in 1998, Germany currently discusses to introduce them again to keep unicorns listed at home.

6.   Conclusions

For many decades, academics viewed the U.S. corporate governance system as a role model due to its dispersed ownership structure and adhering to the classic "one-share-one-vote" principle. This structure typically minimizes agency problems between management and share-holders as well as between majority and minority shareholders. In Europe, different models for allocating ownership and control rights exist. In the Nordic countries, firms employed dual-class shares granting multiple voting rights often and successfully for many decades (Sweden, Finland, Denmark and Norway). However, multiple-voting shares frequently received strong

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[49]   Consequently, to have the majority of the voting rights for all possible voting situations (75%) in the annual shareholders' meeting, the entrepreneur needs to own 37.6% of all shares. This is quite substantial for entre-preneurs in need for raising additional equity to finance growth. It also constitutes a major economic exposure.

[50]   The organizational legal form „Kommanditgesellschaft auf Aktien, KGaA" (limited partnership with shares) consists of two owner types: a general partner ("Komplementär") with personal and unlimited liability and a limited partner ("Kommanditist") with limited liability. Members of the management board are only general partners, while the supervisory board is less influential. In contrast to the common legal form "Aktiengesell-schaft, AG" ("stock corporation") for publicly listed firms in Germany, the supervisory board of the KGaA neither appoints members of the management board nor approves major business decisions. In the *Appendix*, **Table A.3**, we provide an overview of listed KGaAs in Germany.

[51]   Interestingly, during the new economy period (1997-2003), the regulation at the "Neuer Markt" did not permit dual-class shares for high-tech growth firms (Biotech, Internet, Telecom) when going public. Instead, regula-tion went into the opposite direction and reduced the founders voting power substantially when some early investors exited at the IPO, as this triggered the mandatory issuance of additional shares. Bessler and Kurth (2007) provide details on this regulation. This resulted in the unique situation that firms had to issue more shares at the IPO than needed and then repurchased their own shares relatively quickly to mitigate the high agency costs and to reverse the declining stock prices (Bessler et al., 2016).

criticism from academia and institutional investors for representing an inferior corporate governance structure. The idea of implementing a "one-share-one-vote" governance system within the European Union faced some obstacles as a review of the empirical evidence provided a rather ambiguous outcome (Adams and Ferreira, 2008). Obviously, there are pros and cons for each avenue and the preference for one or the other model has been historically country-specific.

Since the new millennium, we observe some fundamental changes in the allocation of cash flow and voting rights. The U.S. financial and governance system has adjusted towards a much more concentrated ownership structure with large active (mutual funds) and passive (ETFs) institutional investors as dominating shareholders. In addition, the U.S. experienced a substantial shift in the private and public equity market environment for start-up firms. As a result, firms stay longer private, as sufficient private equity is available (McKinsey, 2022), and when they eventually go public, they already have achieved unicorn status. A considerable fraction of these unicorns employs nowadays a multiple-voting structure, as founders, inventors and entrepreneurs are less willing to transfer the majority of the voting rights to outside institutional investors. Either of these aforementioned developments result in a concentration of voting rights, as the founders of the company (insiders) or the group of institutional investors (outsiders) control the majority of the voting rights.

Interestingly, securities markets in Asia such as Singapore, Hong Kong, Shenzhen, Shanghai, and Jakarta, have all turned to the current U.S. model by allowing a dual-class structure with multiple-voting shares. Especially, China adjusted the structure to force successful domestic growth firms and unicorns to list at their national securities markets and to motivate the ones that originally listed in the U.S. to return or cross-list at home. One puzzling aspect is why ever more companies in Europe abandoned the historically preferred dual-class share structure by share class unifications or by using single-class shares when going public. France, for example, adopted in 2014 a unique loyalty share model, with limited success for performance and corporate control. In Germany, the government took an extreme position when disallowing shares with multiple voting rights in 1998. Firms in the Nordic countries that historically had allowed multiple-voting shares as a legitimate and successful governance structure marginalized dual-class shares. In fact, the relative numbers of listed firms with multiple-voting shares decreased and firms hardly employ this structure anymore when going public.

In this study, we analyze the different corporate governance issues as well as financial and operating performance for dual-class shares in Europe. Our empirical findings suggest that firms employing dual-class shares when going public experience a relative valuation discount

compared to firms with "one-share-one-vote" structures (H1). However, dual-class firms in most regions achieve a superior profitability (H2), most likely due to the specific skills of the founders. Our regression analysis supports these findings. This leads to two conclusions. Potential agency problems are the reason for the valuation discount, and superior technological and strategic abilities of founders, innovators and entrepreneurs explain the superior operating performance. Combing all firm-year observations, we do not observe any evidence that dual-class shares are negatively associated with Tobin's Q relative to single-class shares, whereas the results from the regional and country-specific analysis suggests a valuation discount in Denmark, Finland, Sweden and Switzerland (H1). Moreover, the results for the profitability variables indicate a higher operating performance of dual-class firms in Denmark, Finland, Austria, Germany, France, Spain and the U.K. (H2). In this context, founding family ownership has only explanatory power for the negative valuation effects (discount) of dual-class shares in Southern Europe (H3). We find no support for the notion that mature dual-class firms are associated with higher agency problems and costs (H4). Finally, the analysis on potential mechanisms via which dual-class shares affect European firms reveals that operational efficiency (H5) and downward adjustment cost (H6) may explain the firm valuation and performance results in some regions.

For future research, it is important to determine whether regulators, securities exchanges, and index providers should or should not constrain the use of shares with multiple voting rights in the U.S. and in Europe. The prevalent view is that they violate good corporate governance standards and possibly are dangerous for investors, despite initially offering a higher performance. However, constraining the use of dual-class shares might hurt public equity markets and investors as more companies might delist and fewer companies might go public. Especially, successful entrepreneurial and founder (inventor) managed companies may want to escape the influence and dominance of large institutional investors and proxy advisors demanding the "one-share-one-vote" principle. However, unsuccessful founder-dominated companies may harm public equity markets and investors. Therefore, it is essential to determine the optimal point in time when the disadvantages exceed the advantages and dual-class shares should be restricted or have to convert into single-class shares. Investigating this issue, we leave for future research.

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Appendix

A.1   Description of our Data Set: Dual-class Shares in Europe

Figure A.2 plots the development of the number of listed firms, new listings (cumulated) and delistings (cumulated) for the all European countries in total, U.K., Belgium, German-speaking countries, and Southern countries over the period from 1994 to 2020. We distinguish between single- and dual-class firms, and report the cumulated number of firms that went public and delisted over the sample period ("new list & delist").

For the UK, **Panel A** clearly illustrates the downward trend (-36.74%) from 1,489 to 942 listed firms since 2000, while the decline of dual-class firms from 62 to 44 is lower (-29.03%).[52] The number of new listings is with 3,142 entries much smaller than the number of the 3,456 exists. This negative net listing rate holds for almost every single year.

The evolution of listings for the southern European countries (Italy, Spain, France and Portugal) we present in **Panel B**. In Italy and Spain, the number of listed firms remained relative stable since 2000, due to almost equal numbers listing and delisting firms. In contrast, France has a high delisting activity (1,350) relative to new listings (1,296), resulting in a negative net trend of -39.2% (844 to 513) from 2000 to 2020. For Portugal, we also observe a declining number of public firms. In almost every year, the number of delisting is higher than the number of new listings. Finally, Spain and Portugal have a smaller number of dual-class firms as this share structure never gained any importance in these countries.

The developments for the German-speaking countries (Switzerland, Austria, Germany) in **Panel C,** reveals a significant decreased in the number of listed firms in this region with the strongest decline in Germany (-41.9%, from 952 to 553) and Austria (-47.0%, from 100 to 53) since 2000. Moreover, the fraction of dual-class firms fell substantially across all countries. In Switzerland and Germany, these figures dropped most dramatically from 65.2% to 9.5% and from 25.5% to 5.9%, respectively. In contrast, the number of firms going public remained at a rather low level in these countries, resulting in the well-known negative listing gap, for which the large number of firms exiting from public equity markets are responsible (Bessler et al. 2021, 2022).

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[52]   In December 2021, the Financial Conduct Authority (FCA) followed the recommendations of the UK Listing Review (2021) and allowed dual-class shares in the premium market segment of the London Stock Exchange. For a discussion, see Lidman and Skog (2021), Reddy (2021) and Yan (2021b).

Figure A.1: Time Series Variation of Dual-Class Firms by Country

Panel A: Southern Countries, Belgium, U.K.
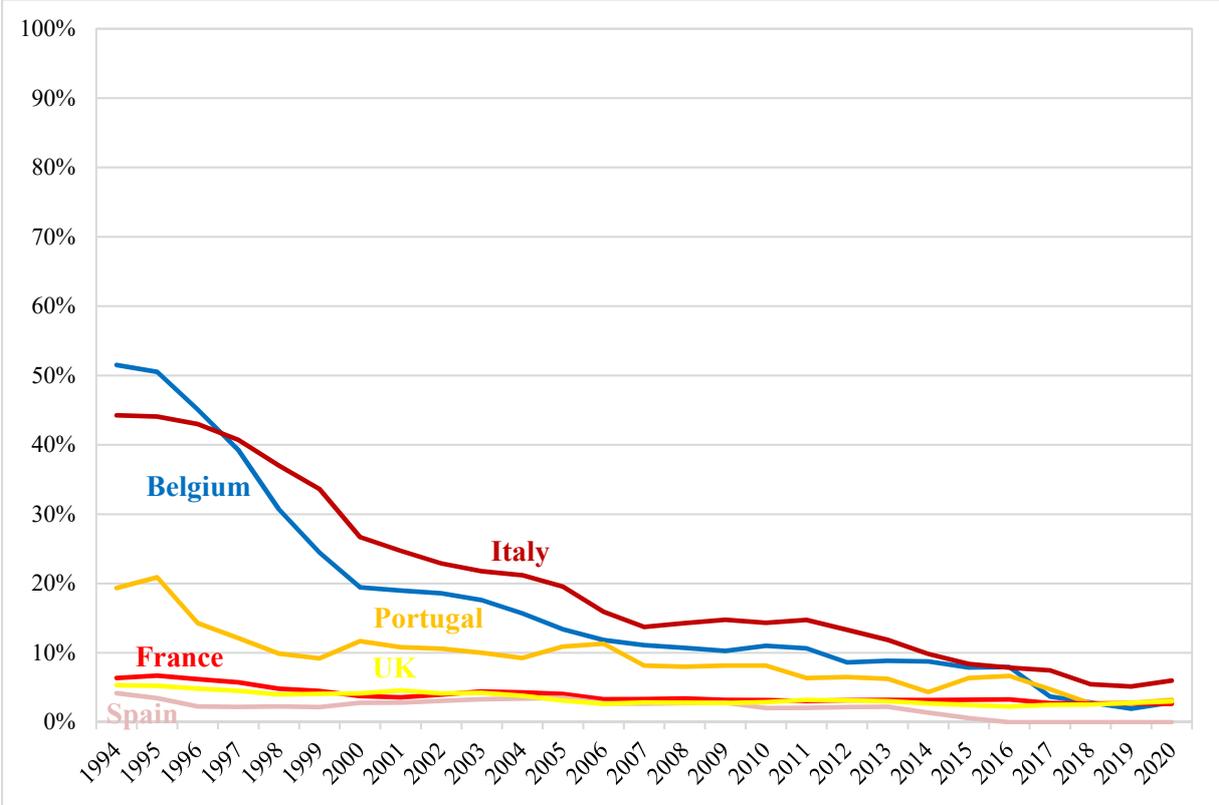
Panel B: Switzerland, Austria, Germany
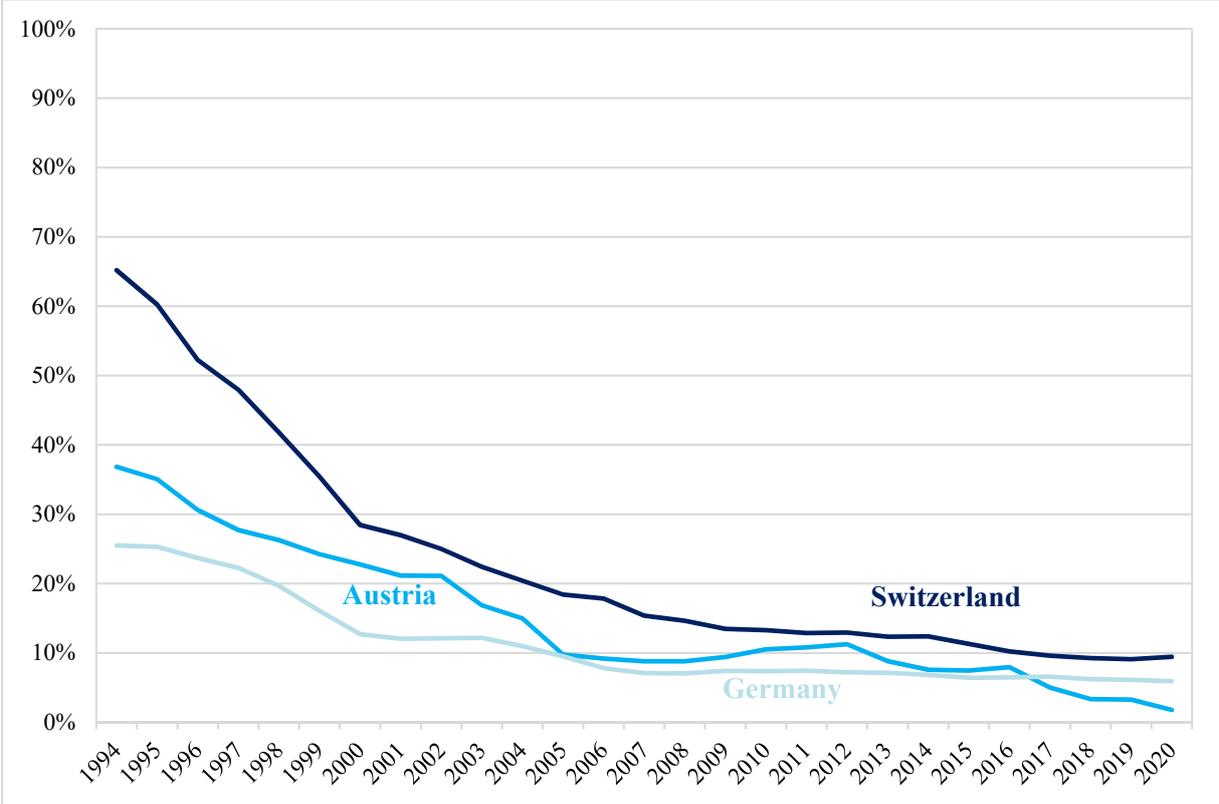
Figure A.2: Number of Listed Firms, New Listings and Delistings in Europe

Panel A: All Countries, U.K. and Belgium

69
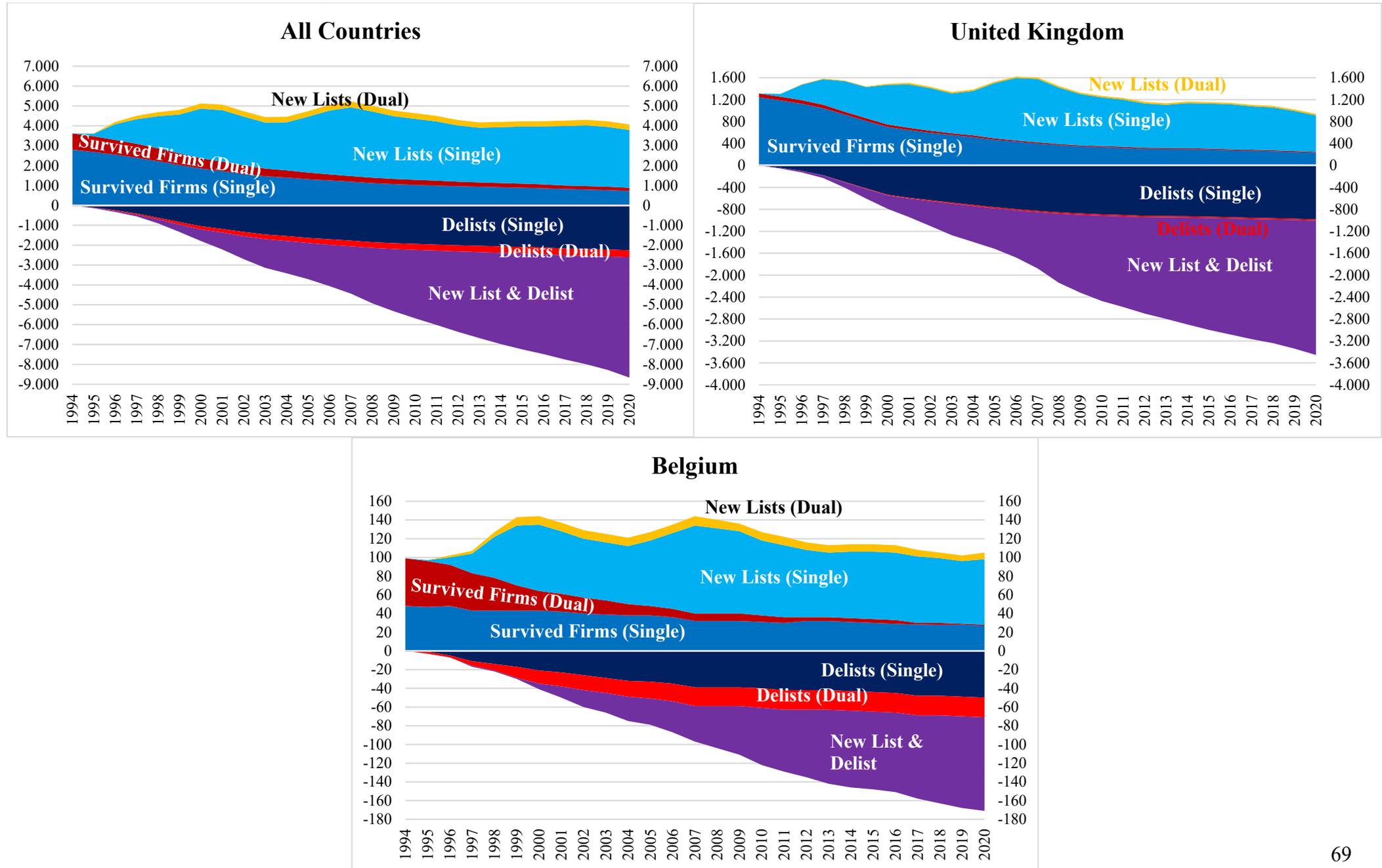
Panel B: Southern Countries
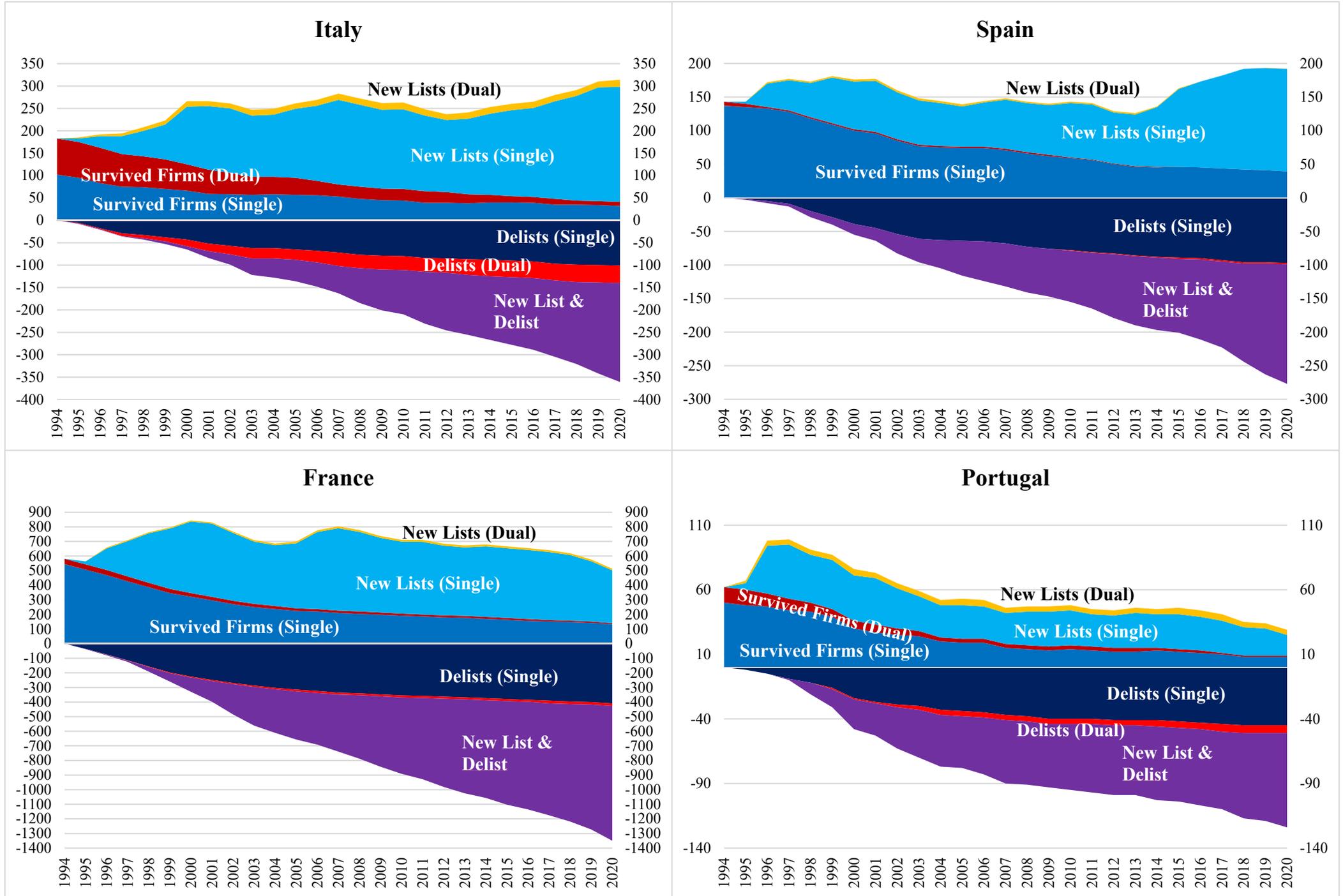
Panel C: German-Speaking Countries
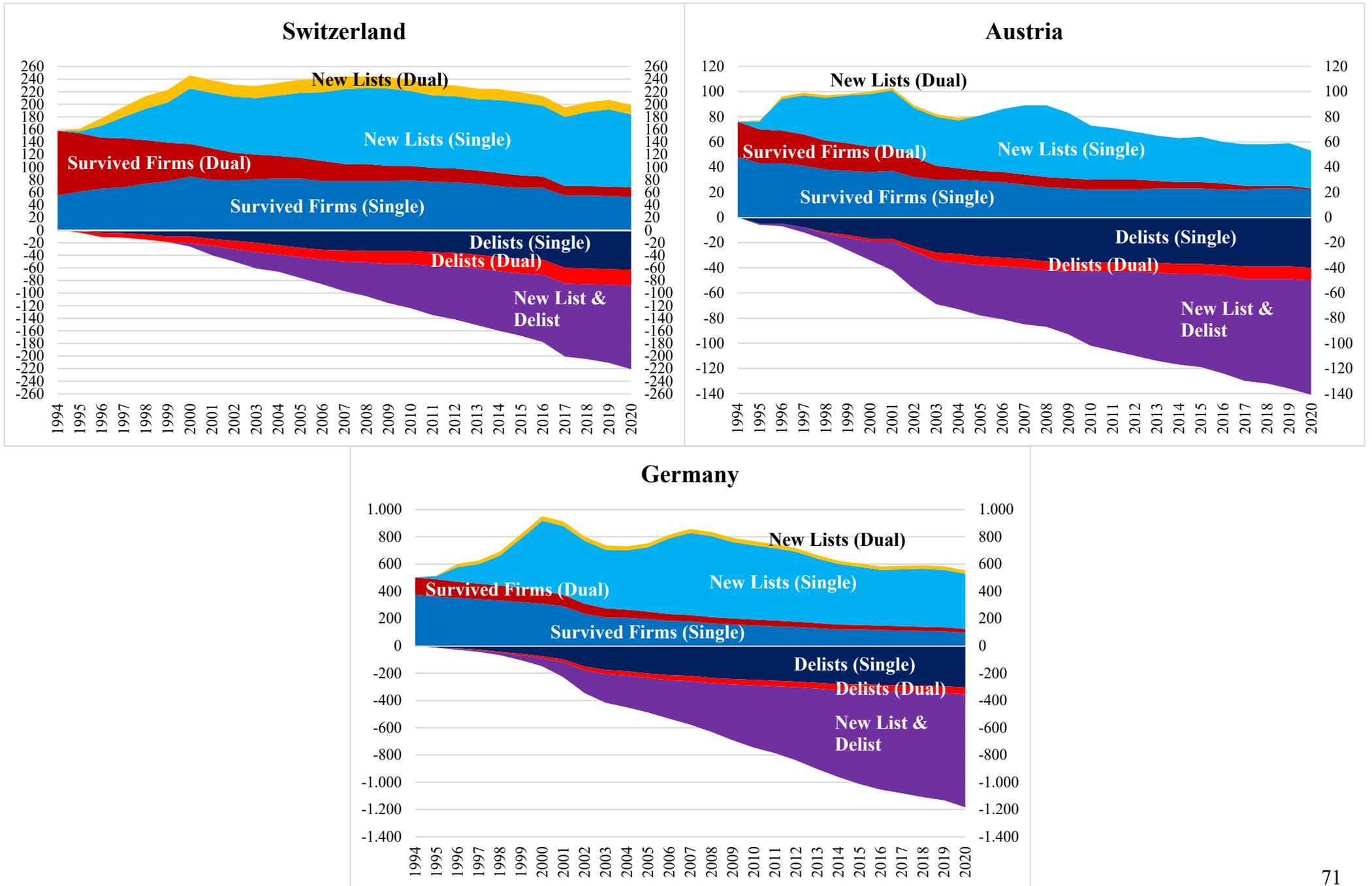
Switzerland

Austria

Germany

Notes: The figures represent the development of the number of listed firms, new listings (cumulated), delistings (cumulated), and delistings of firms that newly listed during our sample period (cumulated) for 13 European countries over the period from 1994 to 2020. We distinguish between single- and dual-class firms and cluster our sample countries into four different regions: Full sample, U.K. and Belgium (Panel A), Southern countries (Panel B), and German-speaking countries (Panel C). We do not report detailed data but is available upon request from the authors. Source: Own calculation based on data from Refinitiv Datastream, annual reports, official filings and press release.

Figure A.3: Development of Listed Firms with Preference Shares in Germany
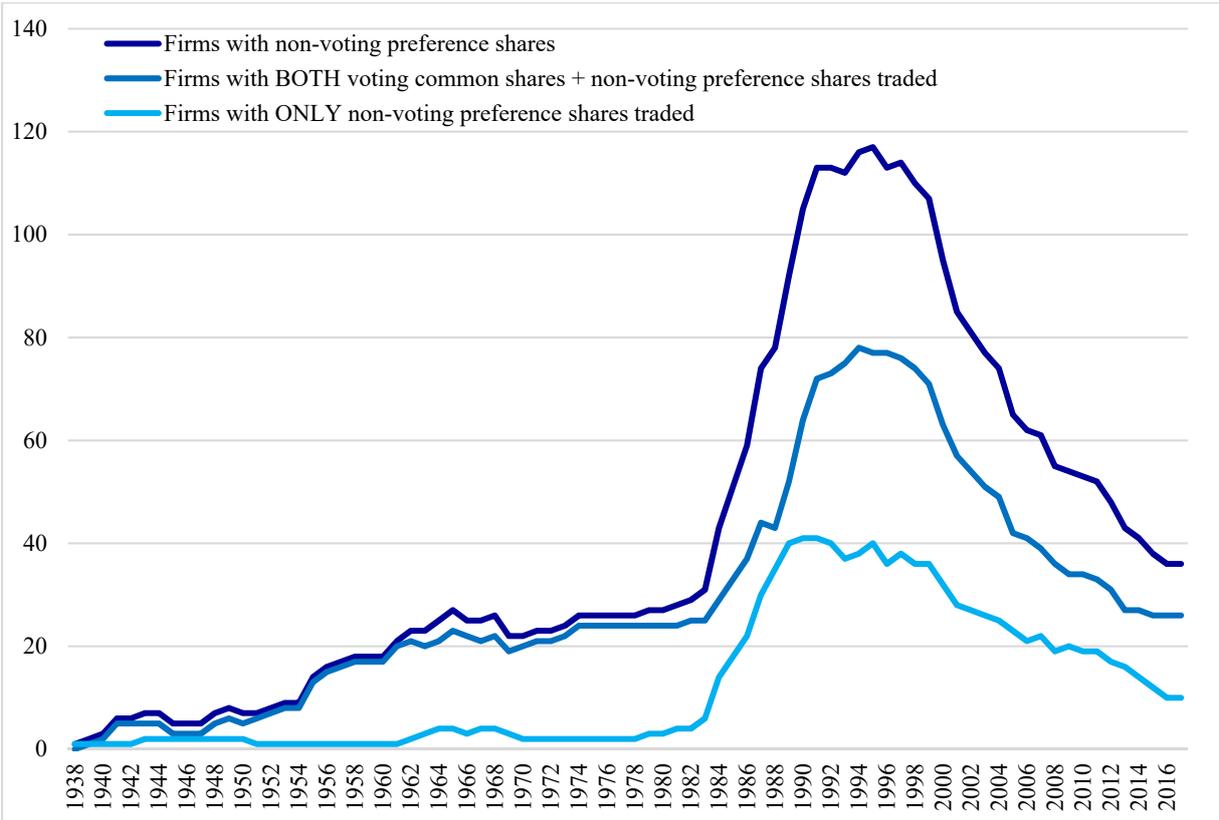
Notes: This figure presents the yearly number of publicly listed firms with preference share structures in Germany. There exist two share classes consisting of the voting common shares ("Stammaktien") and non-voting preference shares ("Vorzugsaktien") over the period from 1938 to 2020. We distinguish between the total number of listed firms with preference shares, firms with both share classes traded, and firms with only the preference shares traded. Source: Daske (2019).

Table A.1: Performance Differences Single- and Dual-Class Firms along the Life Cycle

Panel A - Nordic countries

Variable	IPO	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Dual-Class											
Tobin's Q	1.80	1.85	1.90	1.88	1.70	1.51	1.60	1.55	1.58	1.66	1.68
n	286	268	251	235	213	204	196	186	174	166	160
Single-Class											
Tobin's Q	2.44	2.27	2.13	2.05	1.96	1.97	1.91	1.92	1.81	1.92	1.84
n	1004	963	897	803	685	578	493	428	394	357	320
Difference	-0.64	-0.42	-0.24	-0.17	-0.26	-0.46	-0.31	-0.37	-0.24	-0.26	-0.16
Dual-Class											
RoA	-0.77%	0.95%	1.79%	1.54%	2.63%	-0.47%	0.04%	3.17%	1.76%	2.44%	3.42%
n	286	268	251	235	213	204	196	186	174	166	160
Single-Class											
RoA	-4.98%	-8.86%	-7.58%	-6.78%	-4.93%	-3.59%	-1.94%	-1.24%	-1.40%	-1.24%	-2.77%
n	1004	963	897	803	685	578	493	428	394	357	320
Difference	0.04	0.10	0.09	0.08	0.08	0.03	0.02	0.04	0.03	0.04	0.06

Panel B – U.K.

Variable	IPO	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Dual-Class											
Tobin's Q	1.82	1.52	1.56	1.70	1.41	1.56	1.59	1.58	1.53	1.50	1.61
n	40	36	29	25	24	18	16	16	16	15	13
Single-Class											
Tobin's Q	2.97	2.37	2.10	2.03	1.86	1.82	1.79	1.68	1.72	1.70	1.75
n	1381	1287	1160	988	828	722	632	525	450	391	333
Difference	-1.14	-0.86	-0.53	-0.33	-0.45	-0.27	-0.21	-0.09	-0.19	-0.21	-0.13
Dual-Class											
RoA	-0.26%	-0.21%	1.08%	2.31%	2.38%	6.10%	6.88%	5.06%	5.71%	4.88%	3.36%
n	40	36	29	25	24	18	16	16	16	15	13
Single-Class											
RoA	-5.93%	-8.55%	-8.97%	-8.05%	-5.94%	-6.44%	-6.23%	-2.60%	-3.16%	-2.89%	-0.69%
n	1381	1287	1160	988	828	722	632	525	450	391	333
Difference	0.06	0.08	0.10	0.10	0.08	0.13	0.13	0.08	0.09	0.08	0.04

Panel C - Southern Countries

Variable	IPO	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Dual-Class											
Tobin's Q	1.61	1.51	1.60	1.54	1.64	1.42	1.26	1.27	1.15	1.23	1.13
n	72	67	63	58	52	50	46	40	35	32	31
Single-Class											
Tobin's Q	2.32	2.02	1.76	1.64	1.58	1.56	1.57	1.50	1.44	1.43	1.37
n	1489	1433	1343	1222	1093	984	885	783	721	665	613
Difference	-0.71	-0.51	-0.17	-0.10	0.07	-0.14	-0.31	-0.23	-0.30	-0.19	-0.24
Dual-Class											
RoA	0.68%	-0.44%	1.04%	0.47%	2.09%	2.38%	1.37%	-0.84%	2.72%	1.43%	1.82%
n	72	67	63	58	52	50	46	40	35	32	31
Single-Class											
RoA	1.36%	-1.23%	-1.33%	-1.54%	-0.70%	-0.17%	0.06%	0.47%	0.61%	1.59%	1.16%
n	1489	1433	1343	1222	1093	984	885	783	721	665	613
Difference	-0.01	0.01	0.02	0.02	0.03	0.03	0.01	-0.01	0.02	0.00	0.01

Panel D – Switzerland

Variable	IPO	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Dual-Class											
Tobin's Q	1.39	1.24	1.41	1.62	1.37	1.19	1.34	1.42	1.24	1.29	1.42
n	32	30	27	27	23	21	18	16	16	16	16
Single-Class											
Tobin's Q	2.10	1.83	1.75	1.76	1.69	1.64	1.70	1.76	1.82	1.89	1.90
n	165	160	153	143	136	126	120	110	105	94	89
Difference	-0.71	-0.60	-0.34	-0.14	-0.32	-0.45	-0.36	-0.34	-0.58	-0.60	-0.48
Dual-Class											
RoA	1.91%	2.44%	-2.95%	1.10%	3.37%	2.75%	4.07%	6.44%	6.30%	3.49%	0.98%
n	32	30	27	27	23	21	18	16	16	16	16
Single-Class											
RoA	0.95%	-1.20%	-1.35%	-0.10%	0.49%	1.02%	-0.67%	2.03%	-0.09%	1.87%	1.94%
n	165	160	153	143	136	126	120	110	105	94	89
Difference	0.01	0.04	-0.02	0.01	0.03	0.02	0.05	0.04	0.06	0.02	-0.01

Panel E – Austria

Variable	IPO	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Dual-Class											
Tobin's Q	0.98	0.94	0.90	0.92	0.94	0.96	0.94	0.95	0.94	0.94	0.95
n	7	6	5	5	4	4	4	4	4	4	3
Single-Class											
Tobin's Q	1.94	1.74	1.40	1.48	1.60	1.58	1.37	1.34	1.31	1.44	1.35
n	74	67	57	55	50	46	45	42	39	36	34
Difference	-0.96	-0.80	-0.49	-0.55	-0.66	-0.62	-0.43	-0.39	-0.38	-0.50	-0.40
Dual-Class											
RoA	0.70%	0.92%	1.49%	1.25%	1.18%	1.20%	2.41%	0.23%	1.26%	1.56%	2.13%
n	7	6	5	5	4	4	4	4	4	4	3
Single-Class											
RoA	-5.74%	-3.20%	-1.49%	-1.00%	-0.08%	0.96%	-0.76%	2.83%	1.31%	3.12%	1.81%
n	74	67	57	55	50	46	45	42	39	36	34
Difference	0.06	0.04	0.03	0.02	0.01	0.00	0.03	-0.03	0.00	-0.02	0.00

Panel F – Germany

Variable	IPO	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Dual-Class											
Tobin's Q	1.60	1.50	1.46	1.40	1.42	1.33	1.30	1.33	1.28	1.33	1.34
n	57	55	53	49	47	43	37	34	33	31	27
Single-Class											
Tobin's Q	2.79	2.01	1.62	1.55	1.55	1.54	1.62	1.59	1.54	1.53	1.56
n	820	769	720	649	598	553	506	464	431	395	355
Difference	-1.20	-0.51	-0.16	-0.14	-0.12	-0.21	-0.33	-0.26	-0.26	-0.20	-0.22
Dual-Class											
RoA	2.65%	2.87%	1.56%	1.15%	-0.59%	1.49%	-1.18%	3.59%	2.71%	3.76%	3.27%
n	57	55	53	49	47	43	37	34	33	31	27
Single-Class											
RoA	-1.25%	-5.97%	-9.33%	-7.41%	-5.16%	-2.83%	-1.98%	-1.30%	-1.36%	-1.15%	-1.15%
n	820	769	720	649	598	553	506	464	431	395	355
Difference	0.04	0.09	0.11	0.09	0.05	0.04	0.01	0.05	0.04	0.05	0.04

Notes: The table presents the Tobin's Q and Return on Assets in years relative to the IPO for the full sample by single- and dual-class firms. The sample includes publicly listed firms from 13 European countries that filed for an IPO between 1994 and 2020.

Table A.2: The Role of Ownership in Dual-Class Firms

Panel A: Full Sample -Controlled by Individuals

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets
Single-Class Individual	**-0.160****	0.02	-0.043	0.021*	-0.035	0.004	-0.181	**0.030****	-0.108	0.005	0.01	0.01
	[-2.14]	[1.61]	[-0.56]	[1.96]	[-0.75]	[1.07]	[-1.15]	**[2.32]**	[-1.10]	[0.51]	[0.14]	[1.13]
Dual-Class Individual	0.167	0.011	**-0.244****	**0.065***	-0.046	-0.01	-0.286	**-0.035****	-0.112	**-0.020****	0.093	0.012
	[0.70]	[0.58]	**[-2.00]**	**[1.95]**	[-0.51]	[-0.74]	[-1.57]	**[-2.54]**	[-0.89]	**[-2.08]**	[0.27]	[0.29]
Dual-Class Non-Individual	0.004	0.01	0.186	-0.013	0.069	**-0.010***	**-0.334*****	0.019	0.337	0.008	0.365	-0.005
	[0.04]	[0.79]	[1.44]	[-0.61]	[1.07]	**[-1.81]**	**[-2.63]**	[1.26]	[1.43]	[0.63]	[1.23]	[-0.40]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.352	0.279	0.285	0.304	0.254	0.21	0.456	0.355	0.382	0.187	0.166	0.143
N	5490	5490	10922	10922	10897	10897	1529	1529	581	581	5655	5655

Panel A: Matched Sample -Controlled by Individuals

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets
Single-Class Individual	0.029	**0.039***	0.093	0.024	0.033	-0.006	0.513	0.009	-0.113	-0.032	0.032	0.022*
	[0.18]	**[1.87]**	[0.40]	[0.84]	[0.55]	[-0.69]	[1.17]	[0.42]	[-1.15]	[-1.68]	[0.20]	[1.94]
Dual-Class Individual	0.055	0.011	-0.165	**0.057****	-0.092	-0.007	**-0.314**	**-0.046****	**-0.099**	**-0.017**	**-0.018**	**0.004**
	[0.21]	[0.55]	[-1.10]	**[2.25]**	[-0.99]	[-0.60]	**[-1.60]**	**[-2.03]**	**[-0.34]**	**[-0.55]**	**[-0.05]**	**[0.09]**
Dual-Class Non-Individual	-0.122	0.015	0.095	0.003	0.016	-0.004	-0.386**	0.013	0.191	0.023	0.314	0.002
	[-1.02]	[1.06]	[0.72]	[0.19]	[0.25]	[-0.68]	[-2.61]	[0.88]	[0.60]	[1.57]	[0.87]	[0.16]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.346	0.253	0.322	0.308	0.356	0.259	0.518	0.391	0.522	0.323	0.194	0.169
N	1365	1365	1679	1679	2047	2047	297	297	105	105	746	746

Panel B: Full Sample - Controlled by Others

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets
Single-Class Others	-0.005	0.003	**-0.148*****	0.002	**0.074****	**-0.004**	-0.084	**-0.020***	0.04	-0.006	**0.086***	-0.006
	[-0.12]	[0.37]	**[-3.46]**	[0.29]	**[1.99]**	**[-1.08]**	[-1.24]	**[-1.71]**	[0.59]	[-0.64]	**[1.72]**	[-0.88]
Dual-Class Others	-0.134	**0.032***	-0.101	**0.039***	0.043	**-0.017****	-0.066	-0.018	0.332	0.002	0.826	-0.01
	[-1.09]	**[1.87]**	[-0.82]	**[1.69]**	[0.76]	**[-2.53]**	[-0.35]	[-1.53]	[1.57]	[0.15]	[1.40]	[-0.64]
Dual-Class Non-Others	0.083	0.002	0.199	-0.02	0.109	-0.008	**-0.448*****	0.017	0.522	0.001	0.028	-0.005
	[0.62]	[0.11]	[1.44]	[-0.88]	[1.27]	[-1.13]	**[-3.37]**	[1.09]	[1.25]	[0.02]	[0.24]	[-0.34]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.351	0.279	0.287	0.304	0.255	0.21	0.457	0.355	0.378	0.188	0.171	0.143
N	5490	5490	10922	10922	10897	10897	1529	1529	581	581	5655	5655

Panel B: Matched Sample - Controlled by Others

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets
Single-Class Others	-0.117	**-0.030****	-0.14	0.005	0.089	-0.004	-0.195	0.002	-0.062	**0.066*****	0.002	-0.01
	[-1.16]	**[-2.27]**	[-1.39]	[0.29]	[1.07]	[-0.69]	[-0.92]	[0.20]	[-0.79]	**[3.19]**	[0.01]	[-0.85]
Dual-Class Others	**-0.326****	0.025	-0.116	**0.037*****	0.019	-0.008	-0.228	0.000	0.117	**0.070*****	0.804	-0.011
	[-2.30]	[1.44]	[-0.85]	**[2.62]**	[0.28]	[-1.09]	[-1.29]	[0.02]	[0.39]	**[3.13]**	[1.23]	[-0.68]
Dual-Class Non-Others	-0.069	-0.001	0.101	-0.002	0.035	-0.003	**-0.513*****	0.007	0.197	0.043	-0.044	0.000
	[-0.52]	[-0.08]	[0.71]	[-0.15]	[0.40]	[-0.43]	**[-3.12]**	[0.45]	[0.59]	[1.24]	[-0.32]	[-0.00]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.349	0.257	0.323	0.307	0.357	0.259	0.52	0.378	0.517	0.417	0.22	0.167
N	1365	1365	1679	1679	2047	2047	297	297	105	105	746	746

Panel C: Full Sample - Widely-Held Firm

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets
Single-Class Widely-Held	0.04 [0.87]	**-0.018** [-2.32]	**0.070*** [1.74]	**-0.031*** [-5.34]	0.004 [0.12]	**-0.025*** [-6.21]	**0.130*** [1.84]	0.003 [0.39]	0.05 [0.63]	0.003 [0.27]	-0.041 [-0.68]	**-0.024*** [-3.52]
Dual-Class Widely-Held	0.039 [0.25]	-0.018 [-1.18]	0.26 [1.64]	**-0.053** [-2.13]	0.23 [1.48]	**-0.017*** [-1.76]	**-0.464*** [-1.66]	**0.072** [2.54]	**1.083*** [6.25]	0.031 [1.03]	-0.027 [-0.15]	-0.024 [-0.77]
Dual-Class Non-Widely-Held	0.058 [0.45]	0.015 [0.90]	0.127 [0.92]	0.017 [0.85]	-0.01 [-0.22]	**-0.018*** [-3.00]	**-0.208*** [-1.71]	0.005 [0.38]	0.302 [1.42]	0.006 [0.51]	0.43 [1.22]	-0.011 [-1.00]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.351	0.281	0.286	0.308	0.254	0.218	0.457	0.352	0.382	0.187	0.167	0.147
N	5490	5490	10922	10922	10897	10897	1529	1529	581	581	5655	5655

Panel C: Matched Sample - Widely-Held Firm

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
	Nordic Countries		U.K.		Southern Countries		Switzerland		Austria		Germany	
Dependent variable:	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets	Tobin's Q	Return on Assets
Single-Class Widely-Held	0.155 [1.56]	0.004 [0.29]	-0.055 [-0.58]	**-0.035*** [-2.94]	-0.014 [-0.23]	**-0.017** [-2.55]	-0.071 [-0.45]	-0.009 [-1.03]	0.163 [1.61]	-0.04 [-1.57]	-0.034 [-0.28]	**-0.033** [-2.54]
Dual-Class Widely-Held	-0.015 [-0.10]	0.005 [0.30]	0.049 [0.29]	**-0.036*** [-1.70]	0.12 [0.75]	-0.008 [-0.98]	-0.444 [-1.19]	**0.064** [2.54]	0.571 [1.40]	0.001 [0.04]	-0.157 [-0.59]	-0.019 [-0.59]
Dual-Class Non-Widely-Held	-0.013 [-0.09]	0.027 [1.64]	0.018 [0.12]	0.009 [0.65]	-0.056 [-1.23]	-0.01 [-1.61]	**-0.437** [-2.35]	-0.012 [-0.91]	0.184 [0.60]	0.015 [1.02]	0.395 [0.93]	-0.014 [-1.25]
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Count., Ind., Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R²	0.347	0.254	0.322	0.314	0.357	0.265	0.512	0.401	0.534	0.334	0.2	0.178
N	1365	1365	1679	1679	2047	2047	297	297	105	105	746	746

Notes: The table presents our results from OLS regressions on *Tobin's Q* and *Return on Assets* as the dependent variables. Panel A to C report the results for each type of controlling shareholder for the full data set and matched sample. Our main variable of interest is the dummy for *Dual-Class Shares,* which takes the value of one when the firm issued share classes in a given year, which is used for the combinations with the various ownership structures. (1) *Firms controlled by individuals:* Ultimate owner is an individual person or a family that is neither related to the founders nor to any of their relatives. (2) *Firms controlled by others:* Ultimate owner is neither an individual person nor a family and is not related to the founders. (3) *Widely-held firms*: No ultimate owner holding at least 25% of the voting rights identified. The sample includes publicly listed firms from 13 European countries between 2007 and 2016. For reason of space, we do not report the coefficients of the controls. We control for country, industry and year effects, and report t-values based on robust standard errors clustered at firm-level in parentheses. *, **, *** indicate significance at the 0.10, 0.05, 0.01 level, respectively.

Table A.3: Limited Partnerships on Shares (KGaA) in Germany

ISIN	Company Name	IPO Date
DE0005493092	Borussia Dortmund GmbH & Co. KGaA	30.10.2000
DE0005403901	CEWE Stiftung & Co. KGaA	25.03.1993
DE000A288904	Compugroup Medical SE & Co. KGaA	30.05.1996
DE0005470306	CTS Eventim AG & Co. KGaA	01.02.2000
DE0005550602	Drägerwerk AG & Co. KGaA	28.07.1983
DE000DWS1007	DWS Group GmbH & Co. KGaA	23.03.2018
DE0005649503	Edel SE & Co. KGaA	02.09.1998
DE0005650204	eff-eff Fritz Fuss GmbH & Co. KGaA	16.11.1995
DE0005706535	EUROKAI GmbH & Co. KGaA	13.12.1985
DE0005785802	Fresenius Medical Care AG & Co. KGaA	02.10.1996
DE0005785604	Fresenius SE & Co. KGaA	18.12.1986
DE000A1MMEV4	German Startups Group GmbH & Co. KGaA	11.11.2015
DE0007757007	H&R GmbH & Co. KGaA	21.12.1953
DE000A13SX22	Hella GmbH & Co. KGaA	11.11.2014
DE0006048408	Henkel AG & Co. KGaA	11.10.1985
DE0006083405	HORNBACH Holding AG & Co. KGaA	03.07.1987
DE0006292006	KSB SE & Co. KGaA	01.01.1973
DE0007074007	KWS Saat SE & Co. KGaA	01.01.1952
DE0005878763	Leonardo Venture GmbH & Co. KGaA	29.10.2007
DE0006599905	Merck KGaA	20.10.1995
DE0006614035	Mineralbrunnen Überkingen-Teinach GmbH & Co. KGaA	28.10.1988
DE000A2NB650	Mutares SE & Co. KGaA	10.06.2008
DE0005558696	paragon GmbH & Co. KGaA	29.11.2000
DE0006223407	ProCredit Holding AG & Co. KGaA	22.12.2016
DE0007274136	Sto SE & Co. KGaA	12.05.1992
DE0007493991	Ströer SE & Co. KGaA	15.07.2010
DE000A0XYL04	TIG Themis Industries Group GmbH & Co. KGaA	10.06.2002

Notes: This table presents limited partnerships on shares ("Kommanditgesellschaft auf Aktien", KGaA) publicly listed in Germany.