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The Role of Cornerstone Investors in IPOs

A Study on Long-run Performance and Survival

by

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In Collaboration with Nordea Corporate Finance

Master's Thesis in Finance

May 2024

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Abstract:

The primary goal of this thesis is to understand the role of cornerstone investors in the long-run performance and survival of IPO firms issued during 2014-2023 in the Swedish market. While the phenomenon of cornerstone investors is relatively new, the trend has been increasing exponentially globally. We use several dimensions of cornerstone metrics to explain the dynamics of IPO performance and survival during the study period. We find that the presence of cornerstone investors prolongs the positive aftermarket returns up to 6 months and exhibits increased average aftermarket returns, when compared to unbacked IPOs. The paper shows significant evidence for the positive impact of cornerstone investors on long-run performance from 6-month to 24-month mark. However, contrasting results are seen in the survival of an IPO firm. Another significant contribution of this paper is in determining the quality of the cornerstone investors and how they impact the metrics. We find that IPOs with a higher proportion of cornerstone investors with board independence among the set of investors experience a higher survival rate and a positive impact on the aftermarket return at the 36-month mark.

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1. Introduction

1.1 Background

Initial Public Offers have been the focal point of discussion among academicians and industry professionals alike. While there are several anomalies related to IPOs that are extensively studied, we are interested in exploring the dynamics of the long-run performance. Many studies have reached the consensus that IPOs are poor long-run investments and underperform the market in the long term (Loughran & Ritter 1995). However, more recent research (Chi et al. 2010 and Thomadakis et al 2012) suggests an opposite trend, where new public offerings outperform the market.

One aspect of IPOs that has gained prominence in recent years is the role of the cornerstone investors. These investors are usually financial investors with diverse investment horizons primarily motivated by profitable returns and get guaranteed allocations before the IPO prospectus is issued. This commitment is intended to signal confidence in the future prospects of the issuing firm. In this paper, we aim to understand the impact of the cornerstone investors on the long-run performance of IPOs and the post-market survival of these firms. This research would allow the issuers, underwriters, and other economic agents to understand whether using cornerstone investors is an ‘economically sound decision’.

Despite their prevalence, there remains a dearth of studies that examine the effect of these types of investors on long-run performance. The main rationale behind this is that cornerstone investors are a relatively new phenomenon that occurred for the first time in Europe in 2011 and Sweden in 2014. After the first cornerstone transaction took place in Sweden, there has been a rapid shift in the use of cornerstone investors, and is, at present, widespread among IPO transactions on Nasdaq OMX. This practice has gained traction in recent years, mainly because it instills confidence in the market by signalling strong support for the company's growth prospects.

These investors potentially validate a company's value, thereby reducing information asymmetries. This certification effect is noteworthy as it marks a shift from traditional validation methods like Private Equity (PE) or Venture Capital (VC) backing. Unlike PE or VC, which typically invest in private firms and provide a level of validation through their active involvement, cornerstone investors participate during the IPO phase, signalling the company’s growth prospects and future potential. This signalling effect can be a unique form of certification, distinct from that offered by PE or VC firms, thus warranting an in-depth analysis of how cornerstone investors reduce information asymmetries.

Despite a growing prevalence of cornerstone investors, the research into their effects on post-IPO firm survival remains relatively limited. Around one-sixth of the firms that issued IPOs between 2014 and 2023, were delisted from the market. While this area is not extensively researched, the additional perspective to look into the impact of these investors in the life of the firm post-floatation provides beneficial insights to the issuer firms and investors. While the survival of the firm appears to align with its post-IPO performance, examining survival serves is an unambiguous metric that includes the company's time-to-delist.

Thus, in this paper, we look at both long-run performance and survival because while the long-run performance provides insights into the market's reaction and the company's ability to sustain growth over time, survival analysis offers information about the company's resilience beyond the IPO period. Using both metrics, we assess whether the presence of cornerstone investors translates into sustained market performance. While most papers only examine the impact of the presence of cornerstone investors in the IPOs, here we attempt to bring in several dimensions of these investors, including the proportion of allocation of shares and the type of governance in these investor firms, measured through the level of board independence. Several studies have intensively examined the relationship between governance mechanisms and corporate investments. We develop our rationale on this premise to examine whether this governance dimension could indicate a trend in the performance and survival of IPO firms. By understanding these factors that influence market perception and sustainability, firms can strategically leverage the involvement of cornerstone investors to improve their market position.

1.2 Problem Discussion

Initial Public Offers are considered an expensive process for the issuing firms. Affleck-Graves (1996) shows that it is crucial that the IPOs get a positive exposure to the market for the IPO to have a strong future price development. Given the risks associated with issuing an IPO, it is important that the firms present themselves to the market as a good quality firm, to outweigh the risks.

Considering the impact of IPO issuance on the firm's reputation and growth, the presence of cornerstone investors in the pre-IPO stage emerged as a mechanism to minimize the impact of information asymmetry (Megginson and Weiss (1991)). These investors purchase a significant portion of the offering and hold these for a predetermined period as agreed upon in the prospectus. Several studies have shown that cornerstone investors have a signalling effect in the market, given the information asymmetry between firms and the investors. They certify the quality of the IPO deal and increase the investor trust, thereby improving the success of the offering.

Despite the presence of few research on the impact of cornerstone, the area is still less explored. This study aims to understand the role of cornerstone investors in the long-run performance of IPOs and its impact on the survival of the firm. The relevance of cornerstone investors is relatively unexplored in the field of survival of firms, especially in the IPO market.

1.3 Research Question

Q. Does the presence of cornerstone investors in IPOs signal information about the firm's value and its survival prospects?

1.4 Research Contributions

Since the phenomenon is relatively new, this paper will provide new insights into the role of cornerstone investors. While existing literature only looks at the presence of cornerstone investors, we look at various dimensions of the same and conduct a deeper analysis of the impact of the presence, quantity, and quality of these types of investors on the performance and survival of the issuer firm. In addition, the data for cornerstone investors is not readily available in popular databases, which makes this paper resourceful.

1.5 Scope and Limitations

The primary limitation of this study stems from its exclusion focus on the Swedish market due to limitations in data availability. This geographic specificity allows us to conduct an in-depth analysis within a defined context. However, this may also introduce certain biases due to the unique characteristics of the Swedish market. Consequently, the findings may not be directly replicable in other countries with a different market structure. The study's scope is bounded by the period between 2014 and 2023, which captures significant IPO activities and trends. However, this may not encompass an exhaustive set of relevant changes in the market and investor sentiments. Thus, the general applicability of the findings beyond the specific period may be limited. A key metric for the inclusion of IPO firms in the dataset is 20 million euros. While this data limit facilitates the examination of IPOs within a defined range of offerings, we may exclude smaller IPOs with distinct characteristics.

2. Literature review

2.1 Aftermarket performance:

A well-acknowledged anomaly that has captured the attention of researchers is the sustained underperformance of IPOs over the long term (Ritter, 1991; Brav and Gompers, 1997). Numerous researchers, including Loughran and Ritter (1995), Rajan and Servaes (1997), Teoh et al. (1998), and Schultz (2003), have attempted to comprehend this phenomenon. They attribute this underperformance to investor over-optimism or institutional constraints like short sale restrictions. Jain and Kini (1994) and Mikkelson, Partch, and Shah (1997) document that long-run performance is also accompanied by poor financial accounting performance post-IPO relative to pre-IPO performance and the industry conditions. In line with this valuation misalignment, Purnanandam and Swaminathan (2001) find that IPOs that are priced high relative to the market tend to perform worse in the long run, even though they show higher first-day returns.

As mentioned earlier, previous studies by Loughran & Ritter (1995) presents evidence that IPOs are outperformed by the market in the long term while more recent studies by Ahmad-Zaluki et al. (2007) and Thomadakis et al. (2012) concludes that new IPO issues outperform the market in the long-run.

Affleck-Graves (1996) suggests that the future development of stock prices relies heavily on the initial stock price momentum. Therefore, it becomes important for the companies to garner positive exposure in the market and cultivate a favorable perception surrounding their

IPO. Risks associated with IPOs include the risk of weak investor demand and negative stock price development on the first day of trading (Berk & DeMarzo, 2014).

Significant differences in long-run performance was found across various industrial sectors and time periods in Ritter (1984) when conducting research on a three-year period. In a five-year period analysis, Loughran and Ritter (1995) found evidence of underperformance based on data from the 1970-1980's. Ibbotson (1975) states that the degree of underperformance depends on the time period under examination. Westerholm (2006) studied the Scandinavian market between 1991-2001 and concluded that Nordic IPOs have a negative post-IPO performance in a five-year period.

However, Levis (2011) and Gompers and Lerner (2003) found no evidence of IPO underperformance when they compared IPOs to their benchmarking index. The latter paper concluded that the long-run performance depends on the methodology and benchmark used in the study. Evidence of positive abnormal returns was found in Buser and Chan (1987) when looking at a period of two years. Ritter and Welch (2002) reached the same conclusion as Gompers and Lerner (2003) that the results in post-IPO performance studies are dependent on both methodology and time period used.

2.2 Survival:

Even after a successful IPO, firms continue to face risks and uncertainties that may impact their survival. Hesler et al. (1997) investigate the impact of firm-specific and issue characteristics on IPO survival rates and find that survival rates are positively related to firm age, IPO initial returns, firm size and level of insider ownership. Jian and Kini (1999) finds firm size, barriers to entry, and underwriter reputation are positively related to IPO survival. Ahmed and Jelic (2014) conducted research on the UK market and found that there was a positive relationship between survival rates and lock-up period. In contrast, Espenlaub, S et al states that cornerstone investors appear to have little impact on IPO survival unless the IPOs have been issued with the help of a reputable underwriter.

Hsu (2013) and Michala (2016) have shown that the survival of firms is influenced by the macroeconomic and market conditions at the IPO issue stage. Hensler, Rutherford, & Springer, (1997) states that the firm's age is a significant factor for IPO survival. Among the other factors, the most important ones are the type of firm's leadership (Bach and Smith

(2007)), presence of a generalist CEO (Gounopoulos & Pham (2018), and the firms' earnings management (Alhadab, Clacher, & Keasey, (2015)). The presence of venture capitalists in the post-IPO phase (Jain & Kini, 1999), top management team composition (Walters, Kroll, & Wright, 2010), and audit quality (Jain & Martin, 2005) also relate to IPO survival.

This paper adds to the current body of literature focusing on the survival of IPOs. The continued listing of the firms is essential to the issuers, as they must weigh the higher cost of listing against the potential benefits of remaining publicly traded. Moreover, continuous listing is crucial for market investors who aim to realize financial gains and to stock markets, as a higher rate of delisting could hurt their reputation.

2.3 Cornerstone investors:

McGuiness (2012) research on Chinese markets regarding performance and cornerstone investors found little evidence of underpricing in cornerstone-backed transactions. Interestingly though, McGuiness (2014) found evidence supporting that IPOs which are cornerstone-backed had positive abnormal returns in the long-run. The empirical evidence obtained by McGuiness (2014) is consistent with the signalling and certification theory conducted by Megginson and Weiss (1991).

Cornerstone investors benefit by getting large allocations and issuing firms profit from selling a significant portion of shares. The possibility of using cornerstone investors as marketing material to certify the quality of the deal is believed to increase investor trust and the chance of a successful offering (Chee Keong, 2009). The findings of Allen and Faulhaber (1989) confirm that cornerstone investors serve as a tool to mitigate the risk exposure for issuer firms, essentially by lowering information asymmetry and signalling the firm's quality.

McGuiness' (2014) study on the Hong Kong market found results indicating that stocks that used cornerstone investors generated higher returns. Boehmer et al. (2006) propose that large institutions receive more allocation in favourable IPOs, thereby bolstering post-IPO performance when cornerstone investors are involved. This phenomenon is attributed in part to signalling theory, as the presence of cornerstones sends positive signals to the market regarding the quality of the IPO. McGuiness (2014) and Tan and Ong (2013) both observed that IPOs with cornerstone investors exhibit higher earnings growth. These studies also confirm the finding that such IPOs demonstrate more sustainable earnings growth, which can be interpreted as a mark of high quality. Tan and Ong (2013) underscored the significance of cornerstone investors in the Asian market, emphasizing their role in generating interest in the stock, particularly among retail investors.

However, reports from Financial Times highlighted that the lock-up provisions, which restrict cornerstone investors from selling their shares for a specified period, could lead to concentration of ownership[1]. According to Bloomberg IPO statistics, there has been a noticeable shift in the Swedish IPO market since 2014. Previously, there were no cornerstone commitments, but today, the majority of transactions valued above 36 million euros involve cornerstone investors.

3. Theoretical framework

3.1 Aftermarket performance and Survival

In this paper, we examine the well-discussed anomaly about IPOs that in the long-run, IPOs are overpriced. This phenomenon is interesting to look at given that, from the investor's perspective, it presents opportunities for active trading to gain superior returns and allows us to examine the informational efficiency of the IPO market. Ritter (1991) explains the long-run underperformance as a result of risk mismeasurement and overoptimism among the investors about the future potential of certain industries.

As per efficient market hypothesis (EMH), a publicly traded IPO would be like any other stock once it enters the market and thus the after-market stock price would reflect the shares' intrinsic value. Fama (1970) introduced the EMH which states that all available information is factored into the pricing dynamics of securities. Based on this hypothesis, it becomes impossible to systematically outperform the market in the long-run.

The concept of long-run underperformance of IPOs could be also attributed to the information asymmetry theory and the associated incidence of misvaluation. Information asymmetry theory suggests that the misaligned possession of information between economic agents create inequalities in decision-making (Akerlof 1970). In the context of IPOs, public investors are at a disadvantage compared to the insiders, resulting in adverse selection

[1] https://www.ft.com/content/4e45e478-6b48-11e6-ae5b-a7cc5dd5a28c

problem. The amount of information that is shared by the firm becomes crucial to estimating the fair value of the firm. This resulting information asymmetry can lead to mispricing of firms. Watanabe (2008) suggest that high information asymmetry leads to higher risk and insecurity, causing refrain from investors to participate in the firm. This is similar to an IPO issue, especially for smaller firms with lower public interest before going public.

Several studies also use the cumulative prospect theory to explain the long-term performance of IPOs. This theory suggests that some investors overvalue the outlier distribution of the security, taking high risk and are willing to pay high premiums for these securities. These securities can become overpriced and will thereby yield lower returns in the long-run (Thaler et.al., 2003). Another theory is the herding behaviour theory which suggests that investors follow the actions of the market participants.

The impresario effect is associated with the hot-issue market states that the underwriters involved in the issue push for a lower offer price than their actual worth based on the firm's fundamentals. In markets with high IPO activity, the underwriters are incentivized to induce underpricing in new issues. Since a lower price can attract more investors in the market, the underwriter will be deemed as a high-quality advisor. Thus, in essence, the hot issue phenomenon contributes to short-run aftermarket returns and a long-run underperformance in such periods.

In relation to the presence of underwriters, the popular principal-agent theory holds. The principal-agent problem is a classic conflict of interest case when the interests of the principal and the agent are not perfectly aligned. The underwriter may possess more information about market conditions, investor demand, and pricing dynamics than the issuing firm. Another dimension is the moral hazard problem where the underwriters may engage in risky behaviour knowing that the costs of any negative outcomes will be primarily borne by the issuing company.

Since the underlying event for both survival and long-run performance of IPOs are similar the theoretical framework for these events are aligned too. Two main theories that underscore the relationship between cornerstone investors and IPO survival are selection theory and certification theory. The selection effect refers to the superior abilities of informed investors to identify firms of high quality prior to their IPO issue. The certification hypothesis suggests that reputable informed investors can certify the quality of the issuing firm. Since cornerstone investors seek returns mostly in the medium term, they are likely to impact post-IPO performance through the aforementioned effects. The stakeholder theory emphasizes on the importance of considering the interests of all stakeholders like investors, employees, and the customers. Cornerstone investors, by actively participating in the IPO process and demonstrating a long-term commitment to the firm, may enhance stakeholder trust and support, thereby contributing to firm survival. The network theory is also noteworthy in explaining the survival of the firms. This theory posits that social networks and relationships are important for an organization's success. Cornerstone investors, with their extensive networks and connections in the financial and business community, may facilitate access to valuable resources, opportunities, and information, ultimately enhancing firm survival.

3.2 Cornerstone investors

Cornerstone investors are those who commit to purchasing a significant portion of shares before the official IPO issuance and intend to hold these shares for a specified time period. It is crucial to distinguish them from anchor investors. Anchor investments are substantial orders placed at or near the beginning of the book-building process, offering initial momentum similar to cornerstone investments. However, anchor investors do not face a lock-up period and their commitments are generally not disclosed in the IPO prospectus. As opposed to cornerstone investors, the anchor investors are not guaranteed an allocation and may be subject to reductions during the book-building process. In contrast, cornerstone investors agree to a lock-up period, during which they cannot sell the allocated shares. This lock-up period is intended to prevent the immediate sale of shares for profit, thereby fostering market stability and confidence.

Cornerstone investors enter into contractual placing agreements with the issuing company and its advisors, guaranteeing them a share allocation at the IPO. The share is allocated prior to the release of the IPO prospectus and before finalizing the number of shares for subscription to retail and institutional investors. The listing rules require IPO firms and their underwriters to disclose the full details relating to the allocation of shares to these investors. The guaranteed allocation of shares often comes with lock-up agreements made between the investors and the underwriters, where they are prohibited from selling the allocated shares during an agreed lock-up period. The main motivation to participate in the IPO issue is for the guaranteed allocation.

In this paper, when investigating the presence of large investors such as institutions or funds, the scope of this study will be limited to cornerstone investors, thus excluding anchor investors and other similar types of investors. Such a distinction is made due to the different motives and characteristics of this type of investor, especially the fact that anchor investors typically do not have lock-up periods.

Several theories can be used to explain the impact of cornerstone investors in IPOs. The most significant ones are the allocation effect derived from Stoughton and Zechner's (1998) control theory, the negotiation effect derived from Welch's (1992) cascade theory, and the cherry-picking effect introduced by McGuinness (2012).

The allocation effect derived from Stoughton and Zechner (1998) suggests that issuing firms utilize underpricing as a way to create more demand for IPOs, in order to attract more investors who are willing to subscribe to large stakes in the offering. Welch's (1992) cascade theory suggests that, when cornerstone investors are part of an offering, the offer price becomes subject to a negotiation between the cornerstone investors and the issuing company. Consequently, offer prices in cornerstone-backed IPOs might on average be lower than offer prices in non-cornerstone-backed IPOs. McGuinness's (2012) cherry-picking effect looks at an alternative perspective and considers that cornerstone investors might be good at picking IPOs that are underpriced.

The most noteworthy explanation is provided by the signalling hypothesis by Spence (1973). Due to information asymmetry, the investors will base their decisions based on the information provided by the company. This primary information will send signals about the firm's future earnings potential to the market. The presence of cornerstone investors when a firm is about to go public is usually a signal of good quality (Megginson and Wales, 1991). This theory shows how firms use signalling methods to bridge the gap in the market participants. However, in contrast, Stein (1989) and Jenkinson and Ljungqvist (2001) puts forward a 'signal-jamming' model where managers could manipulate the firm valuation to give higher current earnings, leading to a higher future earnings. When the firms go public after periods of high growth, these estimated future earnings are not sustained after IPO issue. This phenomenon could contribute to long-run underperformance in IPOs as managers send misguided signals to the market. Tan and Ong (2013) consider the presence of cornerstone investors to signal credibility of an offering. Alternatively, the presence of reputable underwriters (Booth and Smith, 1986) and institutional investors are thought of as signalling tools.

To assess the quality of the cornerstone investors, we examine an additional variable that stems from the agency problem theory. Since investment decisions are an important corporate arena that creates tensions between the shareholders and the managers, we look at how this dynamic can reflect on the decision to participate in the IPO decision. Stein (2003) posits that financing frictions and agency problems represent two fundamental factors that can potentially distort corporate investment decisions. Since corporate boards are important mechanisms to address agency problems since they both monitor and advice managers in important strategic decisions, several studies show that the proportion of independent directors on the board can improve investment efficiency and reduce the risks of overinvestment (Agyei-Mensah (2021). Hermalin and Weisbach (2003) state that board independence is essential in corporate governance, though it is endogenously determined. This allows us to understand whether the board independence among the cornerstone investor firms can impact their decision in choosing a high-quality firm with a successful long-run performance and a considerably higher survival risk.

4. Development of Hypotheses

In order to answer the main research question, the following set of hypotheses have been adopted. All possible hypotheses for both long-run performance and survival in this study are presented below.

Hypothesis 1A: Cornerstone-backed IPOs exhibit no significant difference in long-run performance compared to unbacked IPOs

If hypothesis 1A is rejected, we can infer that cornerstone-backed IPOs exhibit significant differences in long-run performance. This could be attributed to the higher level of validation offered by cornerstone investors when they are part of an IPO, based on the signalling hypothesis by Spence. Given the quality signalling provided by cornerstone investors, we expect the presence of these investors, proxied using a dummy variable, to positively impact the performance of the IPOs in the long-run. Based on existing literature, we figure that the cornerstone-backed IPOs will outperform in the long-run compared to unbacked IPOs.

Hypothesis 1B: The proportion of board-independent cornerstone investors signals no significant difference in the long-run performance of IPOs

While theories suggest that the presence of cornerstone investors generally signals confidence in the IPO, the board independence variable can act as a signal of objectivity. Board-independence is defined as the proportion of independent directors on the board of the cornerstone investor firms who are not affiliated with the company's management or major shareholders. These directors are typically viewed as less susceptible to conflicts of interest, thereby signalling a higher level of objectivity in their decision to invest. Their involvement in the IPOs can signal to the market that the company has attracted high-value investors who are making investment decisions based on merit and not personal gain. Under this hypothesis, we examine whether this type of independence affects the long-run performance of IPOs.

Hypothesis 1C: The percentage of allocation to cornerstone investors have no impact on long-run performance of IPO

Cornelli and Goldreich (2001, 2003) propose that informative investors who receive a larger share allocation in an IPO could play a crucial role in revealing the IPO firm's information to the broader market. By allocating a larger share of the IPOs to these investors, the company signals its confidence in accurately assessing its prospects. Their participation with larger share allocation can enhance investor confidence in the IPO. Based on this, we developed our third hypothesis. If hypothesis 1C is rejected, we conclude that the percentage of cornerstone investors impacts the long-run performance of IPOs.

Hypothesis 2A: Cornerstone-backed IPOs exhibit no significant difference in survival of the firm compared to unbacked IPOs

As an alternative to long-run performance, we also look at the impact of the presence of cornerstone investors on the survival prospects of the firm after the IPO issue. The selection theory and certification hypothesis mentioned earlier suggests that cornerstone investors, with their superior abilities to identify high-quality firms and certify the issuing firm's quality, can positively influence IPO survival. In addition, the active participation of cornerstone investors may enhance shareholder trust and support contributing to the firm’s survival as suggested by the stakeholder theory. Given the importance of continued listing for issuers, investors, and stock markets, understanding the role of cornerstone investors in IPO survival is crucial. We developed hypothesis 2A to examine whether the presence of cornerstone investors has any impact on the survival of firms post-IPO. If hypothesis 2A is rejected, we can conclude that participation of cornerstone investors, proxied using a dummy variable, does not impact the survival of the firm.

Hypothesis 2B: The number of cornerstone investors in the IPO has no significant impact on the survival of the firms.

If hypothesis 2B is rejected, we can conclude that the number of cornerstone investors in the IPO significantly impacts the survival prospects of the firm. Here, theoretical motivation remains the same as in hypothesis 2A, but we look at whether the size of the cornerstone investor is significant. We examine investor impact using the number of investors backing the IPO. Based on literature, we expect that more cornerstone investors will decrease the impact on the firm’s propensity to delist.

Hypothesis 2C: The proportion of board-independent cornerstone investors signals no significant difference in the survival of the IPO firms

As mentioned in the certification hypothesis, cornerstone investors can certify the quality of the issuing firm, thereby instilling confidence in the market and potentially improving the firm's survival prospects. Here, board independence contributes to the effectiveness of corporate governance mechanisms by providing impartial oversight and reducing the likelihood of conflicts of interest. This attribute helps mitigate agency problems associated with information asymmetry, moral hazard, and adverse selection, thereby improving firm performance and survival prospects. This additional dimension can offer insights into whether the quality of the cornerstone investors, with respect to governance, can influence the firm’s survival.

Hypothesis 2D: The percentage of allocation to cornerstone investors havs no impact on the survival of the IPO firm

In hypothesis 2D, we examine the share of allocation to cornerstone investors as a avenue of influence. We expect that larger allocation may suggest a greater commitment by investors before the IPO and a greater influence on the issuer post-IPO. This increased financial backing can provide the IPO firm with the necessary capital to pursue its growth strategy and withstand financial challenges, thereby enhancing its survival prospects. Consistent with the signalling theory, the allocation percentage to cornerstone investors serves as a signal of confidence in the IPO firm's prospects and quality.

5. Data and Methodology

5.1 Dataset description

This paper considers IPOs that were issued in Sweden since 2014 with a deal size of more than €20m. The decision to focus exclusively on Swedish IPOs stems from the availability of data, specifically related to cornerstone investors in Sweden. The data on the cornerstone investors is not readily available in any dataset but instead had to be manually checked for each IPO in the Bloomberg database by reviewing the shareholders subscribing to the offering. The data on cornerstone investors was retrieved from press releases and cross-checked with the data provided by Nordea Corporate Finance. However, the study's focus on Swedish market is insightful given the country's very high IPO activity as per Bloomberg, which is significantly more than the other Nordic countries. The cornerstone investor phenomenon has grown strong in the Swedish market compared to other financial markets where the trend hasn't normalized to the same extent. The deal size limit was added to ensure that small issues do not influence our analysis.

The final list of IPOs was cross-checked with Bloomberg and Dealogic databases to ensure that a complete list of IPOs for the relevant period was collected. In the final sample, the paper examines 184 firms between 2014 and 2023. It is also important to note that concerning data quality, IPOs are unique events such that regularities regarding timing do not occur. Thus, the dataset would have an uneven distribution of data points over time. However, this fact doesn't interfere with the methodology implemented in this paper.

Figure 1 depicts the frequency of the IPOs issued in the sample period. Notably, in the period between 2015 and 2017, there was a surge in the number of IPOs issued, surpassing the average. A particularly striking element here is the significant increase in IPOs issued in 2021, aligning with a global trend of increased IPO activity. However, since 2021, the number of issues hasn't reverted back to the average.

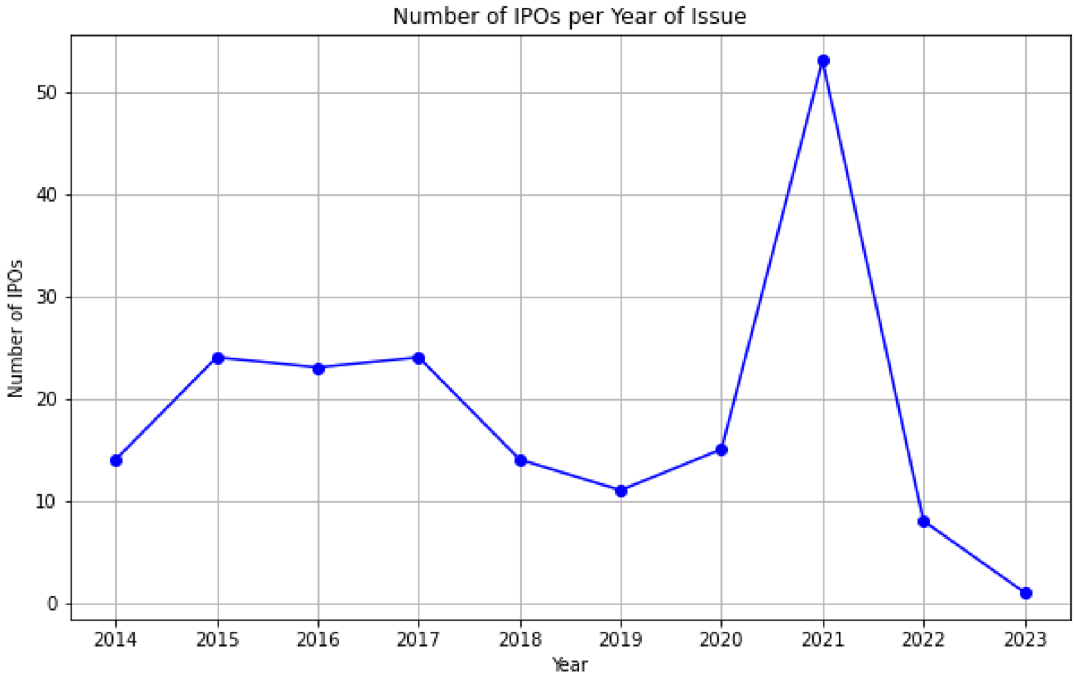

Figure 1: Frequency of IPOs issued per year between Jan 2014 and Dec 2023. Record number of IPO issues were seen in 2021

Figure 2 shows the number of IPOs issued in each industry classification. There are six main industry classifications according to the ICB codes, where Industry_1 denotes the technology sector, Industry_2 denotes the healthcare sector, Industry_3 denotes the financial sector, Industry_4 denotes the consumer service sector, Industry_5 denotes the industrial sector, and Industry_6 denotes the energy sector. As is evident in the figure, the consumer services sector, the financial sector, and the industrial sector exhibit the highest number of issues, while the energy sector has the lowest number of IPO issues.

Figure 2: Frequency of IPOs issued during the sample period across the six industry sectors. The financial sector, consumer sector, and industrial sector exhibits a record number of issues between Jan 2014 and December 2023

Year	***Full Sample***	***Cornerstone-Backed***	***Non-Backed***	***Proportion of cornerstone investors***
2014	*13*	*1*	*12*	*7.6%*
2015	*24*	*14*	*10*	*58.33%*
2016	*24*	*13*	*11*	*54%*
2017	*23*	*16*	*7*	*69.5%*
2018	*14*	*7*	*7*	*50%*
2019	*11*	*7*	*4*	*63.63%*
2020	*14*	*8*	*6*	*57.14%*
2021	*52*	*40*	*12*	*76.92%*
2022	*8*	*8*	*0*	*100%*
2023	*1*	*0*	*0*	*0%*

Table 1: Overview of cornerstone investors in IPOs issued during the sample period. The proportion of cornerstone investors have increased since 2014 and has involved in more than 50% of the IPOs issued. Record number of cornerstone-backed IPOs are present in IPOs listed in 2021 and 2022.

As mentioned earlier, the presence of cornerstone investors has become prevalent in Sweden since 2014. Table 1 shows the proportion of cornerstone investors involved in the IPOs issued in the market, which has remained above 50% of the total IPOs issued each year. Figure 3 confirms the trend and shows that there is a clear increase in the average number of cornerstone investors across the sample period.

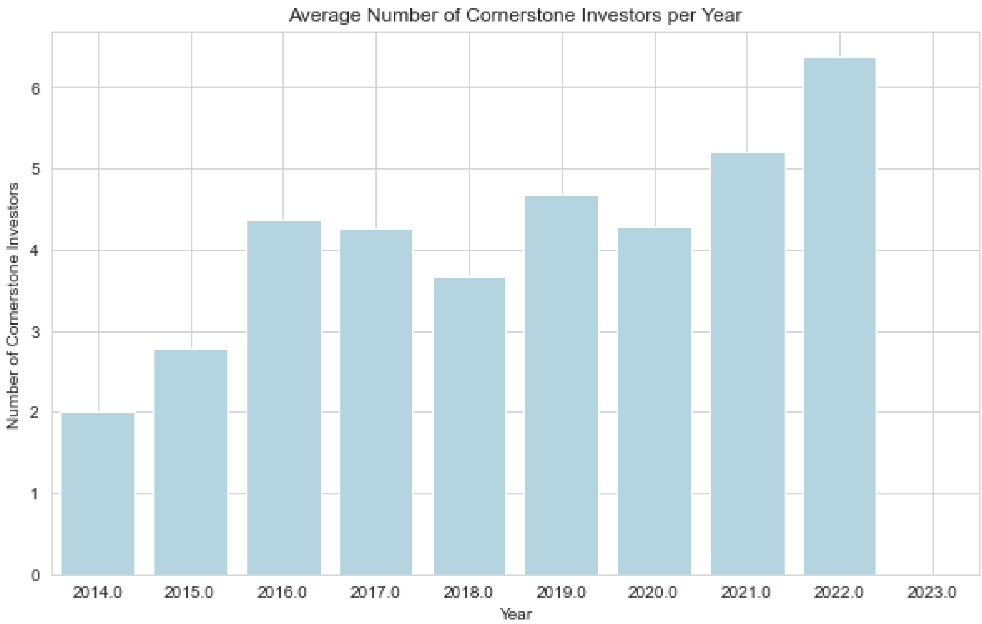

Figure 3: Average number of Cornerstone investors involved in each IPO has shown an increasing trend since its inception, with an average of >6 investors in 2022 issues.

5.2 Market Regulations

This section provides insights into the regulatory requirements of the market studied in this paper. The market is governed by the EU laws to ensure high standards of reporting transparency and accountability, in addition to the domestic authority regulations. The SFSA is responsible for ensuring compliance with EU regulations relating to financial markets and Swedish securities legislations in Sweden. The listing rules are issued by the stock exchanges and Multi-Trading Facilities.

The central requirement for admission of trading in Main Market (2024) is as follows:

a) 25% of the issuer's Shares within the same class are in Public Hands; or

b) at least 10% of the issuer's Shares within the same class are in Public Hands as long as the value of the aforementioned Shares is at least SEK 500 million; and

c) the issuer's Shares are held by at least 500 Qualified Shareholders. If, however, the number of Qualified Shareholders is less than 500, but more than 300, the Exchange may consider this requirement satisfied if the issuer retains the services of a Liquidity Provider[2].

5.3 Long-run performance calculation:

As the scope of this paper is to study the effect of cornerstone investors on long-run performance of IPOs, we use Ritter's version of Buy-and-Hold-Returns. Here, we measure the BHAR as a percentage difference between the closing price on the second day of trading and the closing price on the same day in the different time horizons, in excess of the benchmark returns during the same period.

Using this method, we can measure the accumulated abnormal returns over the investigated period, including the compound interest effect. This allows for calculating the returns as close to what an investor would realise (Barber and Lyon, 1997). The method can be defined as:

$$BHAR_{i,T} = \prod_{t=1}^{T}(1 + R_{i,t}) - \prod_{t=1}^{T}(1 + r_{i,t})$$

where Ri,t is the simple return for company i's IPO in time t, r_{it} is the simple return for the relevant benchmark in the corresponding time t and $BHAR_{i,T}$ is thus the buy-and-hold abnormal return for company i's IPO through a period covering time t = 1 to T.

An alternate approach is to calculate Cumulative Abnormal Returns (CAR), which is also a widely used model for measuring long-term abnormal returns. This paper employs the BHAR method for calculating long-run returns because these estimates are the geometric returns based on gross returns which has the statistical feature of being conservative over longer time horizons. However, it is important to note that BHAR has the disadvantage of being skewed in comparison to CAR measure. Due to the compounding effect of BHAR, some observations

[2] https://www.nasdaq.com/docs/2022/12/13/Nasdaq-Stockholm-Consultation-Document-221214.pdf/

will have very large returns leading to outliers depending on the sample size and time horizon. This is avoided in CAR approach, where returns could be more normally distributed.

The most important bias of long-run returns in this study is arguably the survivorship bias. To account for this bias, this study includes all the IPO firms, despite being delisted within 3 years of issue.

It is noted by Ritter (1991) and Levis (2011) that BHAR calculations are highly dependent on the choice of benchmark. This paper follows Ritter's (1991) methodology of using a matching firms' benchmark, based on industry classifications and market capitalisation. This has the benefit of better capturing the expected return from firm specific risk. It is to be noted that when firms are not presented with a perfect match with respect to both market size and industry, the next best alternative from a different industry is chosen as a benchmark. The same is applied if the chosen benchmark firm has delisted before the completion of the 3 years post-IPO. While the alternative is to consider share indices, a downside to using these indices as benchmarks is that they most often include the examined IPOs, so-called benchmark contamination, which could lead to a bias towards higher explanatory power in the statistical tests and a tendency to understate the abnormal returns (Loughran and Ritter, 2000).

To account for possible endogeneity problems in the regression model that arises when the explanatory variable is correlated with the error term, we include control variables for industry classifications. Additionally, we did not find significant mentions of other types of endogeneity, such as those due to measurement errors or simultaneous causality, within the literature relevant to our study. Therefore, our primary focus remains on addressing endogeneity due to omitted variables through the inclusion of appropriate control variables and robustness checks.

5.4 Survival metric:

Survivors are defined as the stocks of firms that continue to be traded on the exchange until the end of the study period. Each IPO is tracked until the end of the study period to determine whether it has been delisted or not.

The length of time a stock remains listed post-IPO matters both to the issuers and the investors alike. Companies generally choose to list their stocks whenever they expect the benefits of listing to offset the high costs of an IPO and the ongoing costs of being a listed company.

Following the existing literature (Espenlaub, S et.al., (2016)), this paper uses survival analysis to investigate the determinants of the survival rates. In our study, we consider IPOs to be "right censored" if they have not yet been delisted and remain listed until the end of the study period (31 December 2023). Here, we apply the Kaplan-Meier method to estimate the survival rates for each post IPO-month for the full sample. For the purpose of comparison, we also estimate the survival rates for both cornerstone-backed and unbacked IPOs using the log rank test and assess whether they share the same survival curves. This paper uses Accelerated Failure Time (AFT) model and Cox-proportional hazard model for the survival analysis. The AFT model allows us to assess the impact of independent variables on the survival time by allowing these variables to change over time, depending on the length of time since listing.

The AFT model is expressed as a log-linear function with respect to time. Unlike traditional linear regression models, where we assume normality of distribution, the survival analysis allows the accommodation of censored data, which is not normally distributed. The equation for AFT model can be represented as:

$$Ln(Tj) = \beta 0 + \beta 1X1 + \beta 2X2 + \cdots + \beta pXp + \epsilon j$$

Here, Tj represents the survival time of firm j, and X1 through Xp are covariates influencing the survival time. $\beta 0 \ to \ \beta p$ are the coefficients to be estimated and εj is the error term. In AFT model, instead of modelling the hazard rate directly (as in Cox proportional hazards models), the logarithm of the survival time is regressed on covariates.

Based on existing literature, we use the size of offering as a proxy measure for the extent of information asymmetry regarding the prospects of the issuer firm. IPO firms issuing higher proportion are considered to have less uncertainty regarding their future earnings prospects (Jain and Kini 2000).

The use of survival analysis has benefits that exceed that of ordinary statistical methods in predicting failure. Unlike survival analysis, the discriminant analysis and logit models are only able to predict the occurrence of the event, and not its event time. The survival analysis allows us to understand the conditional probability of failure, given that the firm has survived for a certain period of time. Thus, it can deal with right censored data where the response hasn't happened yet and with time-series data with different time horizons. Both of these characteristics are common in the IPO market. The time window of floatation is different for each firm during the sample period. Thus, a firm that went public in 2014 is tracked for 7 years compared to a firm that went public in 2019, which is only tracked for 2 years.

For the purpose of the study, we define survivors as the firms that continue to operate independently as public organizations, while non-survivors are the ones that are delisted from the trading exchanges due to acquisition or any other negative reasons. This classification is in line with Hesler et.al.,1997.

From previous literature, the following control variables are accounted for when measuring survival of IPO firms, such as IPO size, size of the firm, initial returns, and institutional ownership. Accounting for the findings of Espenlaub, S et al paper, we also add underwriter reputation as a control variable.

5.5 Underwriter reputation:

Since underwriters are an important part of the IPO issue process, there is a need to define underwriter reputation holistically. Carter et al. 1998 and Howton 2006 finds that the reputation of the lead underwriter will impact the investors' valuation of the firm. Since the future business of the underwriter depends on the success of the IPO, it is in the best interest of the underwriters that the IPOs they manage are successful. Most studies use market share as a tool for determining underwriter reputation. However, this metric can be biased towards global firms who are often leading IPOs with larger issues. To account for this, the Carter and Manaster ranking has been employed. Since the ranking is from 0 to 9, the paper uses a dummy variable that assigns 1 for underwriter reputation if a firm with score 8 and above figures in the list of underwriters and 0, if otherwise. It is to be noted that the correlation between Carter and Manaster score and the market share metric is 95%, as studied by Fang et al.

5.6 Significance tests

To statistically verify the hypotheses regarding the post-IPO performance with and without cornerstone investors, numerous tests are employed on the data set.

5.6.1 Statistical tests for long-run performance

There are two categories of statistical tests that are used in this study, namely parametric and non-parametric tests. Parametric tests have stricter assumptions about the underlying distribution of the dataset, typically assuming a normal distribution. Non-parametric tests, on the other hand, make fewer assumptions about the underlying distribution of the data. They are generally used when the dataset does not meet the assumptions of parametric tests. These tests are more robust to violations of assumptions such as normality and are considered more appropriate when dealing with skewed datasets or ordinal data.

Using the Jarque-Bera test, we find that the dataset is highly skewed and non-normal. Following Ritter (1999) methodology, this paper employs the bootstrap resampling techniques for estimating parameters and confidence intervals in regression analysis. Instead of assuming a particular distribution for the sample, this technique involves randomly sampling the dataset with replacement to create multiple bootstrap samples. The regression models are fitted to each bootstrap sample and the coefficients are calculated. In this technique, the bootstrapped p-values are calculated by finding the original coefficient vector in the ranked distribution. These bootstrapped p-values are similar to the ordinary least squares values.

In relation to heteroscedasticity, we have conducted the popular Breusch-Pagan test (seen in Table 1 in Appendix A). Both the LM-Test p-value and the F-test p-value exceeded the significance level, indicating that we fail to reject the null hypothesis of homoscedasticity. Consequently, we assume that the dataset is homoscedastic, meaning the variance of the error term remains constant across observations.

Lastly, we employ the Breusch-Godfrey test for autocorrelation (seen in Table 2 in Appendix A) to see whether there is any correlation between the dependent and the independent variables. The test shows that the autocorrelation is not significant implying that the error terms of different observations are not correlated with each other.

5.6.2 Statistical tests for survival analysis

As the AFT is a parametric model as mentioned earlier, we need to specify the distribution of the baseline survival function. Here, we use the likelihood ratio to determine the appropriate distribution. The AIC is the most appropriate test for choosing the best-fitting model in non-nested models, such as log-normal distribution. The AIC is defined as

$$AIC = -2LnL + 2(k + c)$$

,where L is the maximized value of the likelihood function, k is the number of model covariates and c is the number of model-specific distributional parameters. Note that both log-normal and log-logistic models have two distributional parameters. Since the AIC test shows that the lognormal distribution has a lower AIC value than the log-logistic model, we select the lognormal distribution in our analysis.

6. Model Specification:

6.1 Long-run performance:

6.1.1 Variable Selection

To investigate the possible explanations for the long-run performance of IPOs and the relevance of cornerstone investors, we choose the following variables based on the existing research. As for the core independent variable, we look at three different dimensions of the cornerstone investors, (1) the presence of cornerstone investors as a binary variable, (2) the proportion of board-independent firms in cornerstone investors, and (3) the percentage of offering allocated to cornerstone investors.

Based on the literature, the initial returns of each IPO stock are calculated on the first-day closing price against the offer price. Ritter points out that there is a strong tendency for firms with high adjusted initial returns to have the worst aftermarket performance. This pattern is mainly observed in smaller issues than larger ones.

Ibbotson, Sindelar, and Ritter (1988) document the "hot issue market" phenomenon. Ritter has documented a phenomenon of clustering in the volume of IPOs. At certain periods, the aftermarket performance from the IPOs is higher than average, which is followed by a period of higher-than-average volume of IPOs. This is motivated by firms that want to exploit the higher investor interest and optimism. As investor sentiment is high, the companies intend to time their issue to this sentiment, thereby securing a higher price than its value. Thus, such companies will likely underperform in the long run.

Earlier studies finds that firm size is important in determining the long-run performance of the IPO stocks. However, more recent studies like Kim,et al, (2015) with data since 2008 finds that firm size is no longer relevant. It is evident from various studies that the reputation of the underwriter associated with the IPO is significant in the performance of the stocks in the short run. The relationship between the underwriter and the cornerstone investor could lead to higher short/medium-term performance, as compared to IPOs without cornerstone investors.

6.1.2 Univariate analysis

In Table 2, we present a summary of IPOs issued between 2014 and 2023. The dataset shows a total number of 184 IPOs with the BHAR values for 1 to 6 months, 12 months, 24 months, and 36 months. Our total data sample of IPOs exhibits an average positive benchmark adjusted return in the first three-month period. However, this pattern reverses in the period after 3 months. The table shows that there is a negative average adjusted return in the long run. This suggests that IPOs in the market struggle to sustain positive performance over the long run. In addition, the volatility of the BHAR returns is lower for the initial months, while it increases progressively in the long run. This is indicative of the changing market dynamics and investor perceptions over time.

	mean	50%	std	max	min
1 month	0.05566	0.015641	0.35513	0.99953	-1.4829
2 month	0.06362	0.027356	0.37684	1.08262	-1.7305
3 months	0.0477	0.021179	0.37625	1.07171	-1.7062
4 months	-0.5048	-6.50E-05	7.38591	1.02077	-100
5 months	-0.5208	0.015698	7.38596	1.34826	-100
6 months	-0.5026	0.025926	7.38905	1.63835	-100
12 months	-0.5298	-0.00668	7.39878	2.24516	-100
24 months	-1.2036	0	10.463	3.84004	-100
36 months	-1.1352	0	10.5376	5.91163	-100

Table 2: Univariate analysis of IPO performance from 1 to 36 months. In the long run, there is an average negative performance for these IPOs

From Table 3 with 108 observations of cornerstone-backed IPOs, it is evident that the presence of cornerstone investors in IPOs significantly impacts the long-run performance, which clearly differs from the full sample performance. There is seen to be a lasting positive performance until the first 6 months of issue. However, beyond the 6-month mark, the mean returns turn negative, suggesting a reversal in performance in the long run (12 to 36 months). Consistent with the full sample statistics, the volatility is relatively lower in the early months until 6 months, and progressively increases in the long run. However, it is important to note that the variability is lower for cornerstone-backed IPOs when compared to the full sample.

	mean	std	min	25%	50%	75%	max	count
1 month	0.03513	0.314378	-1.4829	-0.0529	0.02358	0.14156	0.9749	108
2 month	0.0538	0.333207	-1.5218	-0.0625	0.03883	0.18659	0.96615	108
3 months	0.03743	0.353864	-1.7062	-0.1211	0.00982	0.20373	0.96476	108
4 months	0.0302	0.3777	-1.7786	-0.1382	-0.022	0.26415	0.88264	108
5 months	0.02593	0.393892	-1.3553	-0.1852	0.02306	0.22786	1.34826	108
6 months	0.06719	0.41327	-1.0427	-0.1602	0.03492	0.29911	1.63835	108
12 months	-0.0099	0.587335	-1.6569	-0.3385	-0.0314	0.28225	2.24516	108
24 months	-1.0648	9.655652	-100	-0.6586	0	0.17712	3.30962	108
36 months	-0.9715	9.748778	-100	-0.572	0	0	4.61114	108

Table 3: Univariate analysis for cornerstone backed-IPOs reveals that the long-run average underperformance is lower than the full sample.

For unbacked IPOs in Table 4, the underperformance starts from the 4th month onwards, similar to the full sample. Initially, the volatility is lower in the insitial months and progressively increases over time. However, the variability is greater than the variability faced in cornerstone backed IPOs over the entire time period. Thus, we can conclude that the aftermarket performance for IPOs that are cornerstone-backed is significantly different from the IPOs that are unbacked.

	mean	std	min	25%	50%	75%	max	count
1 month	0.084834	0.40652	-1.375	-0.0843	0.01333	0.15069	0.99953	76
2 month	0.07756	0.43331	-1.7305	-0.1208	0.00882	0.23933	1.08262	76
3 months	0.062305	0.40793	-1.4239	-0.1295	0.03824	0.21561	1.07171	76
4 months	-1.26495	11.485	-100	-0.1917	0.05442	0.26018	1.02077	76
5 months	-1.29769	11.4824	-100	-0.2728	0.01343	0.29601	1.03608	76
6 months	-1.3122	11.4823	-100	-0.193	-0.0022	0.33153	0.93041	76
12 months	-1.2687	11.495	-100	-0.2714	0.0437	0.4683	1.63083	76
24 months	-1.40079	11.5776	-100	-0.4001	0	0.48995	3.84004	76
36 months	-1.36782	11.6301	-100	-0.3921	0	0.30855	5.91163	76

Table 4: Univariate analysis for unbacked IPOs reveals that the underperformance starts early in the period of study and has significantly more negative performance as compared to the full sample.

6.1.3 Regression Model

To find the underlying factors that affect the performance of IPOs, we conduct a multivariate regression that aims to describe the relationship between the stock performance and the explanatory variables.

$$BHAR = \beta 0 + \beta 1 Cornerstone + \beta 3 Initial\ Returns + \beta 4\ Hot_{period} + \beta 5\ Size + \beta 6\ Offer\ Size\ (M) + \beta 7\ UR + \beta 8\ Industry\ dummy + \beta 9\ Year + \varepsilon$$

, where *Cornerstone* denotes the several dimensions of cornerstone investors, *Initial Returns* is the market adjusted initial return, calculated using the selected benchmark. *Hot period* is a dummy variable for the IPOs issued during hot-issue year. We define hot-issue year as the one with more than 20 IPO issues. As per this definition, we consider 2015, 2016, 2017 and 2021 as hot issue years. *Size* refers to the size of the firm during issue, which is calculated as the log of market capitalization of the firm during the offer period. *Offer size* refers to the total IPO offer size set for allocation by the issuer firm. *UR* refers to the underwriter reputation, which takes the value of 1, when atleast 1 underwriter in the IPO issue has a Carter and Manaster score of atleast 8, else 0. We also control for industry effects and fixed time effects.

6.2 Survival Analysis:

6.2.1 Variable Selection

The AFT Model is generally expressed as a log-linear function with respect to time. The chosen dependent variable is a natural logarithm of the time to delisting (or survival time). We measure 4 different dimensions of the cornerstone investor variable: (1) a binary variable indicating the presence of cornerstone investors, (2) number of cornerstone investors, (3) proportion of shares allocated to cornerstone investors, and (4) proportion of board independent investors in the cornerstone investors.

$$Ln(Tj) = \beta 0 + \beta 1 Cornerstone + \beta 3 Initial\ Returns + \beta 4 Institutional\ ownership + \beta 5\ Size + \beta 6 UR + Year + Industry + \varepsilon j$$

Here, Tj is the natural logarithm of the survival time (or time to delisting). We include various dimensions of cornerstone investors as independent variables, which will be explained in the models. Literature suggests that the initial returns may impact the survival time of an IPO firm. *Initial return* is the difference between the first-day closing and offer price as a percentage of the offer price. *Institutional ownership* is the number of institutional buyers in the allocation. *UR* is the underwriter reputation score which is a dummy variable that takes the value of 1 if a reputable firm is acting as an underwriter, and zero otherwise. To calculate the underwriter's reputation, the Carter and Manaster scoring method is used. *Size* refers to the firm size, which is the log value of market capitalisation at offer. *Industry* is the industry code ranging from 1 to 6. The *Year* is the year of IPO issue. We control for industry and year fixed effects.

6.2.2 Descriptive Statistics

Table 5 shows the number of delisted firms during the sample period of 2014 and 2023 and the proportion of delisted firms to full sample for each year of issue. Over the ten-year period, a total of 184 IPOs were introduced to the market. Delisting, however, was not uncommon, with a subset of these firms exiting the market post-listing. The data reveals fluctuations in the percentage of delisted IPOs relative to the total listed, ranging from 0.00% in certain years to a peak of 29.17% in 2016. Notably, 2018 and 2019 saw no delistings, suggesting high level of stability in those periods. The varying rate of delisting underscores the dynamic nature of the IPO market, prompting studies into the factors that influence this post-listing variability.

Year	*Listed*	*Delisted*	*% Delisted*
2014	*13*	*3.0*	*23.076923*
2015	*24*	*5.0*	*20.833333*
2016	*24*	*7.0*	*29.166667*
2017	*23*	*3.0*	*13.043478*
2018	*14*	*0.0*	*0.000000*
2019	*11*	*0.0*	*0.000000*
2020	*14*	*3.0*	*21.428571*
2021	*52*	*7.0*	*13.461538*
2022	*8*	*1.0*	*12.500000*
2023	*1*	*0.0*	*0.000000*

Table 5: Frequency and proportion of delisted firms among IPOs listed between 2014 and 2023. The percentage of delisting is record low during the low-volume years of 2018 and 2019. The highest percentage of delisting occurred in 2016, followed by 2014 and 2020.

	count	mean	std	min	25%	50%	75%	max
C /binary	184	0.619565	0.486818	0	0	1	1	1
C /% of offering	184	27.29283	25.45936	0	0	29	48.225	90
C /number	184	2.782609	2.79471	0	0	2	5	10
C /% of BI	184	0.318317	0.336269	0	0	0.25	0.571429	1
Initial_Returns	184	0.395501	5.166373	-0.9363	-0.06749	0.0256	0.171056	69.92782
Institutional	184	8.951087	17.94444	0	0	1	10	140
Size	184	5.553456	1.16056	1.609438	4.821562	5.431416	6.208679	9.665192
UR	184	0.673913	0.470059	0	0	1	1	1

Table 6: Univariate analysis of variables in the survival analysis. C stands for cornerstone investors. % of BI stands for the proportion of board independent investors in the cornerstone investors. Institutional refers to the number of institutional investors involved in the IPO. UR stands for Underwriter reputation using the Carter and Manaster score

7. Empirical Results

7.1 Long run performance

The cross-sectional patterns are consistent with the existing literature. We use three different dimensions of cornerstone investors in the regression analysis to understand their impact on BHAR calculated over the time period of 6 months, 12 months, 24 months, and 36 months. The results observed in this thesis differ depending on the dimension used.

The first dimension, the presence of cornerstone investors examined using a dummy variable, shows that the cornerstone investors are significant determinants of long-run performance over 6 months, 12 months, and 24 months. The results in Model 1 shows that the impact is not significant for a three-year period. For all time horizons except 36 months, we find that cornerstone investors have a positive effect on aftermarket performance, statistically significant at 5% level. For two years after the issue, it is found that the presence of cornerstone investors has a positive impact on the long-run performance of the stocks.

Initial returns are found to be significant for the performance in the 6-month and 12-month periods. However, in the longer run, the initial returns are insignificant. Hot period, which refers to whether the IPO was issued during a high volume year, suggests that the year of issue becomes significant in all time periods, except 3 years. The size of the firm and the offer size of the issue are insignificant in determining the long-run performance. It is important to note that Industry_2 denoting Healthcare sector provides significant results, with a positive impact in the first 6 months of the issue and a negative impact after the 6-month period.

Variables	***BHAR 6M***	***BHAR 12M***	***BHAR 24M***	***BHAR 36M***
Intercepts	*-2.8895*	*-3.6925*	*-3.7101*	*0.9735*
	(0.171)	*(3.718)*	*(3.086)*	*(0.654)*
Cornerstone	*3.9972*******	*4.188*******	*4.9196*******	*1.1628*
	(0.082)	*(1.222)*	*(1.252)*	*(0.260)*
Initial	*-11.3287*******	*-7.9289*******	*0.0073*	*0.0197*
Returns	*(0.007)*	*(0.078)*	*(1.931)*	*(0.023)*
Hot_Period	*-3.4660***	*-3.4426***	*-4.3092***	*-2.6025*
	(0.082)	*(1.370)*	*(1.320)*	*(0.274)*
Size	*0.5629*	*0.8413*	*0.8058*	*-0.3243*
	(0.039)	*(0.861)*	*(0.701)*	*(0.148)*
Offer size	*0.0028*	*0.0004*	*-0.0001*	*0.0013*
	(0.000)	*(0.003)*	*(0.003)*	*(0.001)*
Underwriter	*-2.1905*	*-1.9108*	*-3.5288**	*-0.1472*
dummy	*(0.083)*	*(1.296)*	*(1.327)*	*(0.284)*
Industry_1	*-0.0421*	*-1.4282*	*0.7303*	*1.5029*
	(0.088)	*(1.501)*	*(1.657)*	*(0.370)*
Industry_2	*0.0547*******	*-7.2075*******	*-5.7704*******	*-8.4516*******
	(0.104)	*(1.659)*	*(1.532)*	*(0.301)*
Industry_3	*1.2096*	*0.2625*	*1.6755*	*1.2942*
	(0.073)	*(1.210)*	*(1.214)*	*(0.274)*
Industry_4	*0.7957*	*0.0314*	*1.6323*	*2.4635*
	(0.074)	*(1.362)*	*(1.303)*	*(0.279)*
Industry_5	*1.2862*	*0.2958*	*0.6665*	*1.4957*
	(0.078)	*(1.428)*	*(1.416)*	*(0.282)*
Industry_6	*-0.6081*	*2.3005*	*0.3104*	*2.6688*
	(0.148)	*(2.761)*	*(3.381)*	*(0.711)*
R^2	*0.223*	*0.178*	*0.149*	*0.111*
Adjusted R^2	*0.173*	*0.125*	*0.094*	*0.054*

*Table 7: Regression Results for Model 1, using a binary variable for the presence of cornerstone investors. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

In model 2, we use the proportion of board-independent investors in cornerstone investors as the metric of analysis. Here, we find that an increased proportion of board-independent investors do contribute to positive changes in the long-run performance over the 12 months, 24 months, and 36 months. However, the result is statistically significant for the 36-month period, with a positive impact on the long-run performance. Thus, for the 36-month mark, we reject the null hypothesis (*Hypothesis 1B)* and conclude that the proportion of board-independent investors in the cornerstone investors contributes significantly to the long-run performance.

In the case of initial returns, the results are only significant until 2 years of issue, post which the variable doesn't seem to contribute to the long-run performance. The size of the IPO offer has a minimal negative impact on the long-run performance for the 6 months, beyond which the impact is insignificant.

Variables	***BHAR 6M***	***BHAR 12M***	***BHAR 24M***	***BHAR 36M***
Intercepts	*-0.3471**	*-0.5936**	*-3.7107*	*-1.5413*
	(4.661)	*(0.233)*	*(5.511)*	*(5.160)*
Cornerstone	*-0.0144*	*0.0840*	*1.5572*	*9.3156****
	(2.493)	*(0.125)*	*(3.546)*	*(2.890)*
Initial Returns	*0.0293*	*-9.1980****	*-6.9263****	*-1.7025*
	(0.149)	*(0.008)*	*(0.142)*	*(0.173)*
Hot_Period	*-0.0979*	*-0.0089*	*-1.0839*	*-1.2089*
	(1.912)	*(0.089)*	*(2.340)*	*(1.985)*
Size	*0.0775**	*0.1190**	*0.6361*	*0.3757*
	(1.082)	*(0.056)*	*(1.272)*	*(1.116)*
Offer size	*-0.0006****	*-0.0005**	*-0.00009*	*-0.0007*
	(0.006)	*(0.000)*	*(0.006)*	*(0.006)*
Underwriter	*0.1635**	*0.0911*	*-0.0648*	*-0.8277*
dummy	*(1.879)*	*(0.099)*	*(2.378)*	*(1.911)*
Industry_1	*0.1574*	*0.0024*	*0.0280*	*0.7228*
	(1.923)	*(0.089)*	*(2.638)*	*(2.637)*
Industry_2	*-0.1013*	*0.1605*	*-5.4451****	*-6.4615****
	(1.875)	*(0.119)*	*(2.785)*	*(2.866)*

Industry_3	*0.0273*	*-0.0795*	*0.3826*	*0.9242*
	(1.692)	*(0.085)*	*(2.174)*	*(2.013)*
Industry_4	*0.1677**	*-0.1167*	*0.8076*	*1.9532*
	(1.886)	*(0.093)*	*(2.357)*	*(2.059)*
Industry_5	*-0.1029*	*-0.2257**	*0.2509*	*0.6340*
	(1.740)	*(0.100)*	*(2.360)*	*(2.077)*
Industry_6	*-0.3023**	*-0.3347*	*0.2653*	*0.6861*
	(3.477)	*(0.149)*	*(4.717)*	*(4.966)*
R^2	*0.106*	*0.075*	*0.140*	*0.101*
Adjusted R^2	*0.049*	*0.016*	*0.085*	*0.043*

*Table 8: Regression results for model 2, using the proportion of board-independent investors in the total cornerstone investors. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

The third dimension of cornerstone investors is the proportion of IPO offering allocated to the cornerstone investors before the IPO issue. While the variable shows a positive effect over all the periods, except 36 months, we find no substantial significance between offer allocation to cornerstone investors and long-run performance. Thus, we fail to reject the null hypothesis *(Hypothesis 1C)* and conclude that the percentage of IPO offering allocated to the cornerstone investors do not influence the long-run performance of IPOs.

Variables	***BHAR 6M***	***BHAR 12M***	***BHAR 24M***	***BHAR 36M***
Intercepts	*-0.2479*	*-1.6772*	*-4.0141*	*4.4244*
	(0.212)	*(0.250)*	*(7.019)*	*(5.165)*
Cornerstone	*0.0389*	*0.0230*	*0.0398*	*-0.0143*
	(0.002)	*(0.002)*	*(0.046)*	*(0.036)*
Initial Returns	*-0.0073*	*-0.0025*	*-11.4695****	*-0.0265*
	(0.089)	*(0.006)*	*(0.204)*	*(0.176)*
Hot_Period	*-1.6930*	*-0.8536*	*-2.2945*	*-0.9075*
	(0.082)	*(0.101)*	*(2.676)*	*(2.017)*
Size	*0.1081*	*0.3694*	*0.8265*	*-1.0477*
	(0.047)	*(0.059)*	*(1.646)*	*(1.200)*
Offer size	*0.0009*	*-0.0004*	*0.0021*	*0.0027*
	(0.000)	*(0.000)*	*(0.009)*	*(0.006)*
Underwriter	*-1.3201*	*-0.7791*	*-2.1259*	*-0.4204*
dummy	*(0.082)*	*(0.102)*	*(2.545)*	*(2.113)*
Industry_1	*0.1587*	*0.1004*	*1.9811*	*2.3263*
	(0.094)	*(0.121)*	*(2.563)*	*(2.559)*
Industry_2	*-3.1125***	*-3.6134***	*-10.6016****	*-8.5791****
	(0.121)	*(0.117)*	*(2.557)*	*(2.532)*

Industry_3	*0.1248*	*0.1922*	*0.6265*	*2.5762*
	(0.077)	*(0.104)*	*(2.452)*	*(1.957)*
Industry_4	*0.5360*	*0.3324*	*0.7385*	*3.1718*
	(0.081)	*(0.105)*	*(2.720)*	*(2.044)*
Industry_5	*0.4936*	*-0.0939*	*0.8624*	*2.1653*
	(0.081)	*(0.100)*	*(2.532)*	*(2.254)*
Industry_6	*1.5514*	*1.4052*	*2.3787*	*2.7639*
	(0.170)	*(0.255)*	*(5.322)*	*(4.798)*
R^2	*0.054*	*0.048*	*0.219*	*0.119*
Adjusted R^2	*0.007*	*0.013*	*0.169*	*.062*

*Table 9: Regression results for model 3, using proportion of allocation of shares to the cornerstone investors. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

7.2 Survival Analysis

Here, we conduct a multivariate analysis to examine the impact of cornerstone investors on IPO survival after controlling for a range of IPO characteristics and other determinants of IPO survival based on existing literature. First, we estimate an AFT model that controls for issue characteristics including size and underwriter reputation. Several other variables such as age of the firm and offer size were added to the analysis but were not reported due to their high insignificance. As the baseline distribution of the model, we chose log normal distribution based on AIC scores.

Variables	***Model 1***		***Model 2***		***Model 3***		***Model 4***	
	Coeff	***TR***	***Coeff***	***TR***	***Coeff***	***TR***	***Coeff***	***TR***
Cornerstone	*-0.265*	*0.767*	*0.072375*	*1.07558*	*-0.889***	*0.410*	*-0.0098**	*0.9901*
Initial_Returns	*0.025*	*1.026*	*0.0304***	*1.0309*	*0.022*	*1.0224*	*0.023*	*1.0241*
Institutional	*0.512****	*1.668*	*0.4934***	*1.6379*	*0.512***	*1.6699*	*0.4976***	*1.6449*
Size	*-0.296**	*0.744*	*-0.3632***	*0.6954*	*-0.2349*	*0.7905*	*-0.311**	*0.7322*
Underwriter Reputation	*0.137*	*1.147*	*0.2988*	*1.3482*	*0.0437*	*1.0445*	*0.0215*	*1.0218*
Year	*Y*		*Y*		*Y*		*Y*	
Industry	*Y*		*Y*		*Y*		*Y*	

*Table 10: AFT Model results, where each model uses different dimensions of cornerstone investors. Model 1 considers the presence of cornerstone investors as a dummy variable. Model 2 considers the number of cornerstone investors in each IPOs. Model 3 uses the proportion of board-independent investors in the total cornerstone investors. Model 4 considers the proportion of allocation to cornerstone investors. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Model 1 shows the impact of the presence of cornerstone investors on IPO survival. A coefficient of -0.265 indicates that having a cornerstone status is associated with a 23.3% decrease in the hazard of delisting compared to not having a cornerstone status, but this effect is not statistically significant. Interestingly, the number of institutional investors increases the hazard of delisting. A coefficient of 0.512 indicates that higher institutional ownership is associated with a 66.8% increase in the hazard of delisting, and this effect is statistically significant at 1% significance. This raises the question as to why the involvement of institutional investors have a significant impact on IPO survival, while cornerstone backing and allocations to these investors pursuant to the wider IPO allocation, do not. Thus, model 1 confirms that we fail to reject the null hypothesis (*Hypothesis 2A*) and concludes that the mere presence of cornerstone investors doesn't significantly impact the survival of the IPO.

Model 2 shows the impact of the number of cornerstone investors in the delisting event. Holding all other variables constant, a one-unit increase in the number of cornerstone investors leads to a 1.075058 times higher hazard of the event (e.g., delisting). However, the effect is not statistically significant at the conventional levels ($p > 0.05$). In the case of institutional investors, a one-unit increase in institutional ownership leads to a 1.63798 times higher hazard of the event (e.g., delisting). The effect is statistically significant at the 0.05 level. We thereby fail to reject the null hypothesis (*Hypothesis 2B*) and can conclude that the number of cornerstone investors do not impact the survival of the IPO firm.

Model 3 uses the proportion of board-independent investors among the cornerstone investors as a dimension. The proportion of these cornerstone investors is found to have a significant impact at 5% significance. For each unit increase in the variable, the hazard of the event decreases by 59%. This means that companies with a higher proportion of board-independent cornerstone investors are less likely to experience delisting. This variable is statistically significant, indicating that this type of independence among cornerstone investors play a significant role in reducing the likelihood of delisting for companies. Consistent with the other models, companies with a higher number of institutional owners have a higher hazard of delisting. The impact is highly significant at 5% level. Specifically, for each unit increase in the proportion of institutional ownership, the hazard of delisting increases by approximately 67%. Thus, model 3 rejects the null hypothesis (*Hypothesis 2C*) and concludes that the proportion of board-independent investors among the cornerstone investors has a significant influence on the survival of an IPO firm.

Model 4 shows the impact of the proportion of offer allocation to cornerstone investors. The impact is not statistically significant at 5% level but is significant at 10%. Holding all other variables constant, a one-unit increase in the proportion of allocation to cornerstone investors leads to a 0.99101 times lower hazard of the event (e.g., delisting). Conversely, the number of institutional investors significantly increases the hazard of delisting, with a coefficient indicating a 1.64491 times higher hazard. This result is statistically significant at the 5% level, underscoring a robust relationship between institutional investor presence and an increased risk of delisting. Thus, at a 5% significance level, we fail to reject the null hypothesis (*Hypothesis 2D*) that the proportion of offer allocated to the cornerstone investors has no significant impact on the survival of a firm.

7.3 Robustness Checks and extensions

7.3.1 Long run performance

In this thesis, to investigate temporal changes and dynamics of long-run performance, we split the dataset into 2 distinct periods: the Pre-Covid period (2014-2019) and Post-Covid (2020-2023). This analysis allows us to explore the impact of cornerstone investors amidst various market conditions.

The results of the robustness checks have been included in the Appendix. In model 1A with results in Table A3, we examine the presence of cornerstone investors. In the pre-covid period, the presence of cornerstone investors is found to significantly impact the long-run performance until 24 months of issue. In the post-covid period, the results of model 1B seen in Table A4 show that the presence of cornerstone investors is not a significant factor in the long-run performance of the IPOs.

The temporal analysis replicated in model 2, where we use the proportion of board independent investors in the cornerstone investors as a dimension, reveals that a higher proportion of these types of cornerstone investors has a positive impact on the long-run performance of IPOs at the 36-month mark. This result seen in Table A5 is consistent with the main regression results. In the post-covid period, the results are consistent with the pre-covid era as seen in Table A6 where a larger proportion of board-independent investors positively influence the 6-month and 36-month performance.

Model 3A suggests that in the pre-covid period, the proportion of allocation to cornerstone investors significantly impacted the long-run performance at the 6-month mark at 1% significance level. This impact decreases at the 12 and 24-month mark and remains significant at a 10% significance level. In the post-covid, the results in model 3B show no significant impact of allocation on the long-run performance. The results can be found in Table A7 and Table A8 of the Appendix, respectively.

7.3.2 Survival analysis

In this thesis, we prioritize the robustness of our findings through rigorous checks to ensure their reliability and validity. Delistings, while often perceived negatively, can have varied implications depending on the underlying reasons. In our main analysis, we consider all delistings as negative. One key aspect we address in the robustness checks is the treatment of delistings resulting from mergers and acquisitions (M&A). Delistings arising from M&A activities may not necessarily denote unfavourable outcomes for investors in the target companies. So, in our robustness checks, we refine our approach by distinguishing between delistings likely to be unfavourable to investors and those resulting from M&A transactions.

The results in Table A9 in the Appendix C show a consistent pattern as the main analysis. The proportion of board-independent cornerstone investors in Model 3 is seen to cause a decrease in the probability of delisting such that for every one-unit increase in the variable, the hazard ratio decreases by approximately 1.32%. The results from Model 4 suggest that the proportion of allocation to cornerstone investors is statistically significant at 10%, not at 5%. This covariate is seen to have a very minimal impact on the survival time and the hazard ratio slightly less than 1, indicating a potentially negligible decrease in the probability of the hazard event.

As an additional robustness check, we also implement the Cox proportional hazard model, a methodology commonly utilized by researchers such as Carpentier and Suret (2011). In contrast to the Accelerated Failure Time (AFT) model employed in our main analysis, the Cox model does not assume a specific distribution for the baseline parameter. Rather than measuring survival time, the dependent variable in the Cox model assesses the risk of delisting. In the Cox model, the hazard ratio is the marginal effect of the independent variables in the model, similar to the time ratio in the AFT model. The hazard ratio is the exponential of the coefficient in Cox model, while the time ratio is the exponential of the coefficient in the AFT model, according to Klien (1996) and Bradburn et al., (2003) respectively. This implies that we can expect a positive coefficient in the AFT model and a corresponding negative coefficient in the Cox model. Thus, the main analysis results and the robustness checks using the Cox model support the same conclusions.

For Model 1, the comparison between the Accelerated Failure Time (AFT) model and the Cox proportional hazards model reveals consistent findings regarding the impact of the presence of cornerstone covariate on IPO firm delisting. In both models, the coefficient indicates no statistically significant relationship, with coefficients of approximately -0.407 in the AFT model and 0.494 in the Cox model, yielding p-values above 0.05. These results (as seen in Figure A1 in the Appendix C) suggest that the presence of "Cornerstone1" investors does not significantly affect the likelihood of delisting for IPO firms.

For Model 2, we find that both the AFT model and the Cox proportional model estimates the coefficient for the number of cornerstone investors as -0.0325 and 0.0374, respectively. AFT model coefficient approximately has a p-value of 0.605, indicating no statistically significant relationship with delisting. Similar results are obtained from Cox proportional hazard model, with a p-value of 0.654, indicating no statistically significant relationship with delisting as is evident in Figure A2 in the Appendix C.

Regarding Model 3, we find that in the AFT model, the coefficient for the proportion of board-independent investors is negative, with a p-value of 0.0369, indicating statistical significance at 5% level. Upon conducting the robustness check using Cox proportional model, we can confirm the results at a statistically significant p-value of 0.0376, based on the figure A3 in the Appendix C.

For the final model (Model 4) in Figure A4 in Appendix C, both the AFT and Cox proportional model suggest consistent results across the covariates. The proportion of offering allocated to cornerstone investors, as a covariate, exhibits no statistically significant association with the time to delisting for IPO firms, in both models. The coefficients for the covariate are approximately -0.009 in the AFT model and 0.011 in the Cox model, with corresponding p-values exceeding 0.05. This suggests that the proportion of share offering allocated to these investors does not significantly impact the likelihood of IPO firm delisting.

8. Discussion

With regard to the cornerstone investors' impact on the long-run performance, we observe statistically significant evidence that the presence of cornerstone investors has a positive effect on the performance in all time periods except 36 months. This finding aligns with Loughran and Ritter (2003), who argue that underwriters often allocate a large portion of IPO shares to investors who are likely to hold them for an extended period. This strategy appears effective in bolstering short- to medium-term performance but loses its efficacy after three years, suggesting that the signalling effect of cornerstone investors, indicating high quality, diminishes over time. Across various dimensions of cornerstone investors, our study also highlights significant correlations in specific sectors that face high regulatory scrutiny. The presence of cornerstone investors in such sectors is particularly beneficial, as these investors provide a strong positive signal to the market. Given the high level of controversy in these sectors, the requirement of a strong signal is higher, which justifies the use of such investors in these IPOs. In these sectors, the companies are not solely influenced by market forces, but also government policies. Investors consider these companies to be less able to improve their revenues through traditional marketing techniques. So, we can expect the market to give low evaluations leading to positive abnormal returns. However, if the market does not consider the healthcare industry differently, we can expect negative abnormal returns consistent with other industries, as is seen in our analysis.

The impact of the proportion of shares allocated to cornerstone investors at IPO is of limited significance. Upon looking into the proportion of board-independent investors among cornerstone investors, we find that their impact on the long-run performance only reaches significance at the 36-month mark. This delayed effect supports theories that independent directors enhance governance and shareholder alignment, though these benefits take time to materialize fully. Independent directors with broader growth plans can steer the company towards decisions that prioritize long-term growth and sustainability. These decisions may take more time to materialize fully, leading to a significant impact on the 36-month mark. In agency theory, independent directors are often seen as mechanisms to mitigate agency costs by aligning the interests of the shareholders with the managers. When they are not directly affiliated with the company, independent directors are expected to act in the best interests of shareholders and provide effective oversight of managerial decisions.

Across all models assessing long-run performance, initial returns consistently show a significant negative impact. This suggests that higher initial returns are associated with poorer performance in the subsequent months. Theoretically it implies that once the initial investor enthusiasm fades, the stock price may correct itself, leading to underperformance in the subsequent months. This negative relationship can be explained by a market correction, where after the initial spike, the stock might experience a downward adjustment as the market reassesses the firm's true value.

The analysis of four models examining the impact of cornerstone investors on IPO survival yields intriguing findings. The presence of cornerstone investors does not show a statistically significant impact on IPO survival, which is consistent with the existing literature. While cornerstone investors who commit to larger portions of the allotment play a crucial role in the success of the offering in the aftermarket, their presence has near to no significance in the sustained listing of the firm. However, it is interesting to note that higher institutional ownership increases the hazard of delisting, which can be due to the differing investment horizons or risk appetites compared to other investor groups. Consistent with the first model, the number of cornerstone investors also does not exhibit a statistically significant impact on IPO survival. This suggests that the quantity of cornerstone investors may not necessarily correlate with long-term survival.

However, the quality of cornerstone investors seems to matter in the survival of the IPO. This is examined using the proportion of board-independent investors among the cornerstone investors. The model reveals a negative relationship between the proportion of independent cornerstone investors and the hazard of delisting. This suggests that the presence of independent voices among cornerstone investor firms may enhance governance and decision-making, leading to better long-term outcomes for IPO companies. However, this relationship is significant, yet minimal when we consider 'positive' delistings as right-censored observations. The positive relationship between institutional ownership and delisting hazard remains consistent, highlighting the potential risks associated with high institutional ownership levels.

Finally, in the last model, the proportion of offer allocation to cornerstone investors does not show statistically significant impact on IPO survival, though it is significant at lower levels.

This indicates that, while the allocation of a larger portion of the IPO to cornerstone investors may mitigate some risks, it may not be sufficient to ensure long-term survival.

9. Conclusion

The aim of this paper is to understand the role of the cornerstone investors in the long-run performance and survival of a firm. Confirming the conclusions of Westerholm (2006) about the Nordic market, we find that the IPOs in our study face a negative performance in a three-year period. Our results, show that cornerstone-backed transactions have low negative performance as compared to unbacked IPOs, which is in line with the research by Tan and Ong (2003). This could be attributed to the signalling effect of cornerstone investors in the market, especially for controversial sectors. This effect on long-run performance is significant in a two-year period, but it doesn't influence beyond that. When we look at the quality of cornerstone investors, measured using the proportion of investors with board independence, we find a significant impact on the 36-month mark. This dimension is insignificant in the period before 36 months. This suggests that the quality of governance can help in picking out the IPOs that can perform sustainably over the long-run. This dimension can be studied further by expanding the attributes of board independence to look at the proportion of outside directors on the Board, the participation of Executive management in the nomination committee, board diversity, or the aggregation of these attributes as seen in Lu, J. and Wang, W. (2015).

Interestingly, in long-run performance determination, the proportion of allocation to cornerstone investors is not a significant factor. Regarding survival of firms, we find that the mere presence of cornerstone investors, the number of investors, and the proportion of share allocation does not significantly impact the survival prospects of the firm. However, board independence is shown to be a significant determinant of the firm's survival.

In conclusion, our study highlights the multifaceted impact of cornerstone investors on IPO outcomes. While the presence of these investors supports initial performance, their long-term impact is nuanced and dependent on their governance mechanisms. The independence of cornerstone investors emerges as a critical determinant of long-term performance and survival, underscoring the value of strong corporate governance in the IPO process.

10. References

1. Affleck-Graves, J. (1996). "Stock price momentum and initial public offerings." Journal of Finance, 51(2), 383-408.
2. Agyei-Mensah, B. K. (2021). "The impact of board characteristics on corporate investment decisions: An empirical study." Corporate Governance: International Journal of Business in Society, 21(4), 569-586.
3. Akerlof, G. A. (1970). "The market for 'lemons': Quality uncertainty and the market mechanism." The Quarterly Journal of Economics, 84(3), 488-500.
4. Espenlaub, S., Khurshed, A., Mohamed, A., & Saadouni, B. (2016). "Committed anchor investment and IPO survival – The roles of cornerstone and strategic investors." Journal of Corporate Finance.
5. Fama, E. F. (1970). "Efficient capital markets: A review of theory and empirical work." The Journal of Finance, 25(2), 383-417.
6. Gompers, P., & Lerner, J. (2003). "The really long-run performance of initial public offerings: The pre-Nasdaq evidence." Journal of Finance, 58(4), 1355-1392.
7. Guirguis, H.S., Onochie, J. & Rosen, H. (2001). "The post-offering performance of IPOs in the health care industry." J Econ Finan, 25, 194–205.
8. Hesler, J. L., Chen, H., & Kelliher, T. F. (1997). "IPO survival and the new issues market." Journal of Financial Economics, 45(2), 285-310.
9. Ibbotson, R. G. (1975). "Price performance of common stock new issues." Journal of Financial Economics, 2(3), 235-272.
10. Jenkinson, T., & Ljungqvist, A. (2001). "Going public: The theory and evidence on how companies raise equity finance." Oxford Review of Economic Policy, 17(1), 40-55.
11. Loughran, T., & Ritter, J. R. (1995). "Initial public offerings: International insights." Pacific-Basin Finance Journal, 3(2-3), 239-258.
12. Lu, J. and Wang, W. (2015) "Board independence and corporate investments", Review of Financial Economics, 24, pp. 52-64.
13. McGuinness, P. B. (2012). "Initial public offerings and the long-run performance of newly listed firms on the Australian Stock Exchange." Australian Journal of Management, 37(1), 125-151.
14. Ritter, J. R. (1991). "The long-run performance of initial public offerings." The Journal of Finance, 46(1), 3-27.

15. Ritter, J. R. (1984). "The 'hot issue' market of 1980." Journal of Business, 57(2), 215-240.
16. Stoll, H. R., & Curley, A. J. (1970). "Small business financing: A study of costs and availability." The Journal of Finance, 25(3), 545-557.
17. Stoughton, N. M., & Zechner, J. (1998). "IPO-mechanisms, monitoring and ownership structure." Journal of Financial Economics, 49(1), 45-77.
18. Spence, M. (1973). "Job market signaling." The Quarterly Journal of Economics, 87(3), 355-374.
19. Stein, J. C. (1989). "Efficient capital markets, inefficient firms: A model of myopic corporate behavior." The Quarterly Journal of Economics, 104(4), 655-669.
20. Tan, K. J. K., & Ong, S. E. (2013). "IPO pricing and initial returns: Evidence from Singapore." Journal of Banking & Finance, 37(5), 1461-1473.
21. Thomadakis, S., Radojevic, V., & Ferri, G. (2012). "International financial reporting standards: What are the benefits?" European Accounting Review, 21(2), 207-244.
22. Westerholm, P. (2006). "Market performance and financing in Scandinavia: Evidence from IPOs." Journal of Corporate Finance, 12(4), 796-827.
23. Welch, I. (1992). "Sequential sales, learning, and cascades." The Journal of Finance, 47(2), 695-732.

11. APPENDIX

Appendix A

Breusch-Pagan Test Results:

LM Statistic:	8.934584561328066
LM-Test p-value:	0.7085074051333666
F-Statistic:	0.7980126331103167
F-Test p-value:	0.641899000404288

Table A1: Breusch-Pagan Test

Breusch-Godfrey Test Results:

LM Statistic:	0.017005588629727342
LM-Test p-value:	0.8962456329742017
F-Statistic:	0.015805567601508887
F-Test p-value:	0.9001011024962748

Table A2: Breusch-Godfrey Test

Appendix B

Robustness Check Tests: Long-run performance

Model 1A

Variables	***BHAR 6M***	***BHAR 12M***	***BHAR 24M***	***BHAR 36M***
Intercepts	*4.2764* *(6.644)*	*7.299* *(9.021)*	*-3.2724* *(8.624)*	*-5.3145**** *(1.29)*
Cornerstone	*4.8141*** *(2.338)*	*10.8385**** *(3.445)*	*5.3741** *(3.78)*	*-0.7024* *(0.516)*
Initial Returns	*0.0291* *(0.089)*	*-0.0158* *(0.232)*	*0.022* *(0.256)*	*-1.5077*** *(0.678)*
Hot_Period	*-3.7374** *(2.231)*	*-5.6154** *(3.377)*	*-5.5892** *(4.074)*	*0.3636* *(0.487)*
Size	*-1.0867*	*-1.6476*	*0.5404*	*1.2622****

	(1.753)	*(2.076)*	*(2.136)*	*(0.319)*
Offer size	*0.007* *(0.01)*	*0.0086* *(0.013)*	*0.0027* *(0.012)*	*-0.0054*** *(0.002)*
Underwriter dummy	*-1.8969* *(2.297)*	*-7.8813*** *(3.614)*	*-5.4783** *(4.04)*	*0.2439* *(0.518)*
Industry_1	*2.0128* *(3.464)*	*2.642* *(4.345)*	*3.2746* *(4.678)*	*-0.1064* *(0.646)*
Industry_2	*-2.9074* *(2.467)*	*-8.9187*** *(3.894)*	*-18.2582* *(4.752)*	*-2.1469**** *(0.563)*
Industry_3	*1.3233* *(2.441)*	*2.8489* *(4.468)*	*3.169* *(3.794)*	*-1.2154*** *(0.482)*
Industry_4	*2.1528* *(2.486)*	*4.3744* *(3.985)*	*4.9657* *(3.646)*	*-0.6053* *(0.525)*
Industry_5	*1.695* *(2.418)*	*3.6639* *(4.14)*	*3.5766* *(4.076)*	*-1.2405*** *(0.568)*
Industry_6	*0* *(0.00)*	*2.6886* *(1.352)*	*0* *(0.00)*	*0* *(0.00)*
R^2	*0.083*	*0.207*	*0.255*	*0.258*
Adjusted R^2	*0.010*	*0.117*	*0.179*	*0.182*

*Table A3: Regression results for robustness check using presence of cornerstone investor as a dimension for the pre-covid era. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Model 1B

Variables	***BHAR 6M***	***BHAR 12M***	***BHAR 24M***	***BHAR 36M***
Intercepts	*-0.39* *(0.416)*	*0.6064* *(0.412)*	*0.0145* *(0.495)*	*0.1123* *(0.57)*
Cornerstone	*0.127* *(0.154)*	*-0.2977*** *(0.152)*	*-0.0964* *(0.172)*	*0.1959* *(0.2)*
Initial Returns	*-0.0929* *(0.199)*	*0.0318* *(0.277)*	*0.3777* *(0.273)*	*0.037* *(0.265)*
Hot_Period	*0.1267* *(0.169)*	*0.195* *(0.17)*	*0.5994**** *(0.216)*	*0.5069**** *(0.202)*
Size	*0.0142* *(0.095)*	*-0.1795*** *(0.084)*	*-0.18** *(0.109)*	*-0.0918* *(0.11)*
Offer size	*-0.0003*	*0.0005***	*0.0005*	*0.0002*

	(0.00)	*(0.00)*	*(0.001)*	*(0.00)*
Underwriter dummy	*0.1542* *(0.14)*	*0.0465* *(0.15)*	*0.2863* *(0.155)*	*-0.4779**** *(0.194)*
Industry_1	*-0.0712* *(0.172)*	*0.1201* *(0.164)*	*-0.0394* *(0.185)*	*-0.6888**** *(0.266)*
Industry_2	*-0.0306* *(0.257)*	*-8.03E-17**** *(0.0002)*	*0.3561* *(0.277)*	*0.5566** *(0.325)*
Industry_3	*-0.0087* *(0.142)*	*0.293*** *(0.141)*	*0.1733* *(0.143)*	*0.0882* *(0.166)*
Industry_4	*-0.1299* *(0.161)*	*-0.1996* *(0.157)*	*-0.2685* *(0.172)*	*0.0338* *(0.211)*
Industry_5	*-0.0003* *(0.153)*	*0.4882**** *(0.174)*	*-0.2307* *(0.23)*	*-0.1768* *(0.176)*
Industry_6	*-0.1493* *(0.191)*	*-0.0953* *(0.24)*	*0.0237* *(0.207)*	*0.2993* *(0.244)*
R^2	*0.057*	*0.317*	*0.277*	*0.357*
Adjusted R^2	*0.013*	*0.193*	*0.130*	*0.226*

*Table A4: Regression results for robustness check using presence of cornerstone investor as a dimension for post-2020 period. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Model 2A

Variables	*BHAR 6M*	*BHAR 12M*	*BHAR 24M*	*BHAR 36M*
Intercepts	*-0.5222**** *(0.218)*	*2.4994* *(5.852)*	*-3.625* *(10.431)*	*13.8299* *(14.23)*
Cornerstone	*-0.0595* *(0.101)*	*4.8673** *(2.869)*	*0.7435* *(4.279)*	*8.0956*** *(5.711)*
Initial Returns	*0.0485*** *(0.125)*	*0.0028** *(0.143)*	*-24.5041* *(4.103)*	*0.0676* *(0.274)*
Hot_Period	*-0.1254* *(0.09)*	*-2.5411* *(2.16)*	*-3.5821* *(3.012)*	*-3.1957* *(4.904)*
Size	*0.1362**** *(0.053)*	*-0.4722* *(1.385)*	*0.8288* *(2.436)*	*-4.2941* *(3.518)*
Offer size	*-0.0007***	*0.0029*	*0.0199*	*0.0193*

	(0.00)	*(0.007)*	*(0.016)*	*(0.02)*
Underwriter dummy	*0.1596** *(0.094)*	*-2.2731* *(2.245)*	*-7.1024** *(2.909)*	*2.5627* *(4.602)*
Industry_1	*-0.0285* *(0.103)*	*0.3904* *(3.507)*	*-7.7808** *(4.526)*	*4.275* *(5.605)*
Industry_2	*-0.3046**** *(0.108)*	*-4.6839** *(2.617)*	*-4.8304* *(3.573)*	*-9.7915* *(4.823)*
Industry_3	*-0.0193* *(0.095)*	*0.7435* *(2.352)*	*0.3503* *(3.336)*	*2.1605* *(5.082)*
Industry_4	*0.1009* *(0.079)*	*2.2955* *(2.759)*	*3.4065* *(3.775)*	*6.1613* *(5.515)*
Industry_5	*-0.2707**** *(0.093)*	*0.5848* *(2.457)*	*-1.3236* *(3.407)*	*4.7271* *(5.535)*
Industry_6	*0* *(0.00)*	*3.1692* *(8.534)*	*6.553* *(8.808)*	*6.2975* *(16.08)*
R^2	*0.197*	*0.087*	*0.390*	*0.149*
Adjusted R^2	*0.115*	*0.017*	*0.321*	*0.052*

Table A5: *Regression results for robustness check using proportion of board independent investors among cornerstone investors as a dimension for pre-2020 period. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Model 2B

Variables	*BHAR 6M*	*BHAR 12M*	*BHAR 24M*	*BHAR 36M*
Intercepts	-0.8937** (0.408)	-0.9687*** (0.329)	-0.3375 (0.591)	-0.4282 (0.498)
Cornerstone	0.51** (0.252)	0.2882 (0.204)	0.4121 (0.372)	0.7518** (0.382)
Initial Returns	-0.4477* (0.252)	-0.3062* (0.216)	-0.0595 (0.367)	-0.0904 (0.369)
Hot_Period	0.2871 (0.188)	0.7792*** (0.166)	0.4834** (0.223)	0.4827** (0.237)
Size	0.0809 (0.083)	0.0512 (0.068)	-0.0325 (0.13)	-0.0186 (0.102)
Offer size	-0.0002 (0.00)	-0.0004* (0.00)	-0.0005 (0.001)	0.0002 (0.00)

Underwriter dummy	0.3018** (0.152)	0.1721 (0.138)	-0.3889 (0.247)	-0.5124** (0.236)
Industry_1	-0.0588 (0.153)	-0.3609** (0.139)	-0.0819 (0.251)	-0.1782 (0.239)
Industry_2	0.1829 (0.333)	-0.2195 (0.198)	-0.3505 (0.449)	-0.0755 (0.343)
Industry_3	-0.2067 (0.138)	-0.1416 (0.12)	0.3342* (0.198)	0.2035 (0.176)
Industry_4	-0.0452 (0.154)	-0.1944 (0.138)	0.1958 (0.261)	-0.0209 (0.235)
Industry_5	-0.2148 (0.162)	-0.0561 (0.123)	-0.0771 (0.219)	-0.6006*** (0.216)
Industry_6	-0.5512*** (0.217)	0.0037 (0.132)	-0.358 (0.5)	0.2435 (0.309)
R^2	0.303	0.441	0.259	0.402
Adjusted R^2	0.161	0.327	0.108	0.280

*Table A6: Regression results for robustness check using proportion of board independent investors among cornerstone investors as a dimension for post-2020 period. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Model 3A

Variables	*BHAR 6M*	*BHAR 12M*	*BHAR 24M*	*BHAR 36M*
Intercepts	-5.2852 (10.662)	0.0265 (0.413)	-1.2078 (5.702)	-3.7673 (8.52)
Cornerstone	0.2269*** (0.081)	0.0050 (0.004)	0.0816* (0.049)	0.0312 (0.057)
Initial Returns	0.0474* (0.233)	0.0096* (0.007)	0.0489 (0.143)	0.0471 (0.108)
Hot_Period	-6.881* (3.62)	-0.3804** (0.155)	-2.5585 (2.193)	-0.6074 (2.348)
Size	1.6935 (2.619)	0.0024 (0.104)	0.2299 (1.33)	0.2419 (2.173)
Offer size	0.0070 (0.012)	-0.0018** (0.001)	0.0064 (0.006)	0.0011 (0.011)

Underwriter dummy	*-9.2839**** *(3.831)*	*0.2201* *(0.148)*	*-2.9966* *(2.232)*	*2.5428* *(2.261)*
Industry_1	*2.5097* *(4.962)*	*0.0046* *(0.201)*	*1.0426* *(2.966)*	*1.0636* *(2.668)*
Industry_2	*-9.6266 *** *(4.188)*	*0.0236* *(0.174)*	*-5.0619** *(2.84)*	*-5.1408*** *(2.662)*
Industry_3	*-2.2588* *(4.614)*	*0.1979* *(0.184)*	*-0.3609* *(2.509)*	*0.072* *(2.363)*
Industry_4	*2.2449* *(3.993)*	*0.3844*** *(0.168)*	*1.3677* *(2.75)*	*0.5404* *(2.956)*
Industry_5	*-0.6100* *(4.613)*	*0.0715* *(0.172)*	*0.0918* *(2.462)*	*0.3256* *(2.884)*
Industry_6	*2.4555* *(13.676)*	*-0.6555* *(0.573)*	*1.7129* *(8.473)*	*-0.6281* *(6.274)*
R^2	*0.201*	*0.185*	*0.112*	*0.082*
Adjusted R^2	*0.111*	*0.092*	*0.011*	*0.022*

*Table A7: Regression results for robustness check using proportion of allocation to cornerstone investors as a dimension for pre-2020 period. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Model 3B

Variables	***BHAR 6M***	***BHAR 12M***	***BHAR 24M***	***BHAR 36M***
Intercepts	*0.0665* *(0.333)*	*0.6913* *(0.057)*	*-0.227* *(0.582)*	*-0.8511* *(0.386)*
Cornerstone	*-0.0005* *(0.003)*	*-0.0039* *(0.003)*	*0.0009* *(0.003)*	*-0.0013* *(0.002)*
Initial Returns	*0.4776** *(0.263)*	*0.4379* *(0.298)*	*-0.1143* *(0.27)*	*-0.452*** *(0.231)*
Hot_Period	*0.2327* *(0.168)*	*0.0092* *(0.206)*	*-0.1486* *(0.21)*	*0.5685**** *(0.171)*
Size	*-0.1095** *(0.067)*	*-0.1472* *(0.115)*	*0.0018* *(0.123)*	*0.0879* *(0.071)*
Offer size	*0.0002* *(0.000)*	*0.0007* *(0.001)*	*-0.0002* *(0)*	*-0.0002* *(0)*

Underwriter dummy	*0.3126*** *(0.136)*	*-0.2099 (0.188)*	*0.1219 (0.192)*	*-0.0945 (0.125)*
Industry_1	*-0.0021 (0.188)*	*0.1102 (0.233)*	*-0.0896 (0.215)*	*-0.4045**** *(0.136)*
Industry_2	*-0.1777 (0.251)*	*0.0015 (0.314)*	*-3.88E-18 (0.00067)*	*-0.0793 (0.219)*
Industry_3	*-0.0455 (0.115)*	*0.3186*** *(0.133)*	*0.0186 (0.199)*	*-0.0264 (0.114)*
Industry_4	*0.0700 (0.148)*	*0.1302 (0.224)*	*-0.292 (0.207)*	*-0.1969 (0.13)*
Industry_5	*0.0578 (0.143)*	*0.6913 (0.170)*	*-0.0325 (0.218)*	*0.0035 (0.0035)*
Industry_6	*0.1640 (0.235)*	*-0.0039 (0.317)*	*0.1686 (0.273)*	*-0.1474 (0.236)*
R^2	*0.202*	*0.255*	*0.095*	*0.297*
Adjusted R^2	*0.040*	*0.103*	*0.069*	*0.154*

*Table A8: Regression results for robustness check using proportion of allocation to cornerstone investors as a dimension for post-2020 period. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Appendix C

Robustness Check- M&A as censored

Variables	***Model 1***		***Model 2***		***Model 3***		***Model 4***	
	Coeff	***TR***	***Coeff***	***TR***	***Coeff***	***TR***	***Coeff***	***TR***
Cornerstone	*-0.755*	*0.460*	0.000372	1.000372	-0.01327**	0.986815	-0.0002*	0.999977
Initial_Returns	*0.003*	*1.003*	0.000342	1.000342	0.000298	1.000299	0.000334	1.000334
Institutional	*0.00416*	*1.0004*	0.000416	1.000416	0.000405	1.000405	0.000409**	1.000409
Size	*-0.0021*	*0.997*	-0.00219	0.99781	-0.00138	0.998618	-0.00199**	0.998011
Underwriter Reputation	*0.007*	*1.007*	0.007607	1.007636	0.009432	1.009477	0.00799	1.008022

Year	*Y*		*Y*		*Y*		*Y*	
Industry	*Y*		*Y*		*Y*		*Y*	

*Table A9: AFT results considering Mergers & Acquisitions based delistings as censored events. ***, **, and * denotes significance at 1%., 5%, and 10% respectively.*

Robustness Check- Cox Proportional Model:

Model 1

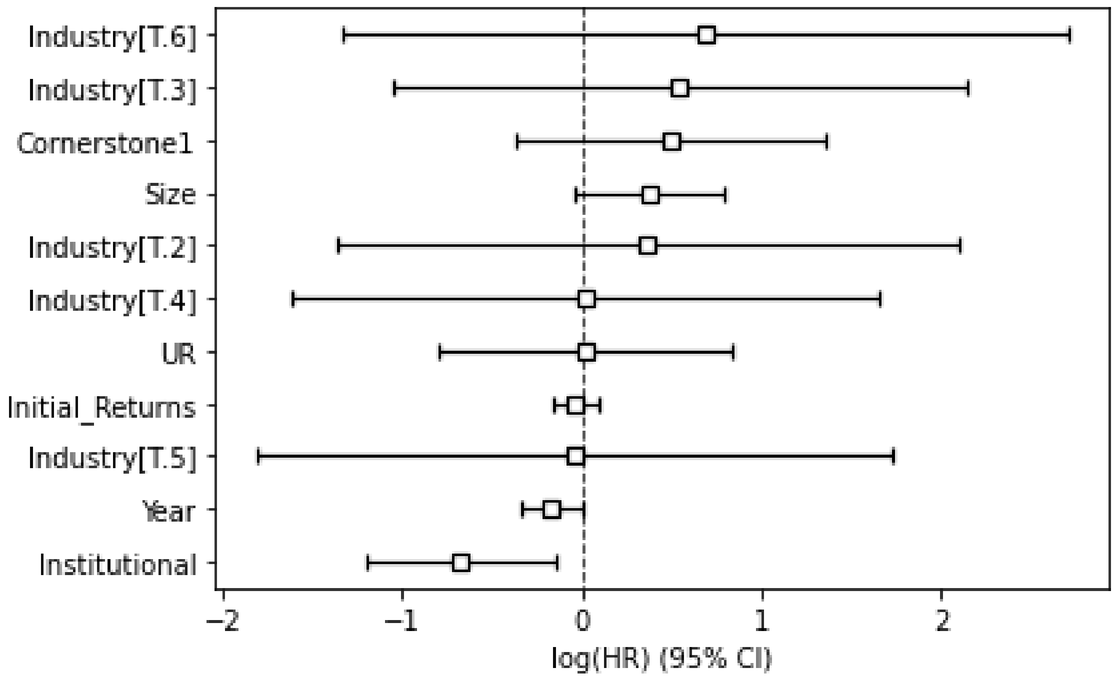

Figure A1: Cox proportional model for presence of cornerstone dimension

Model 2

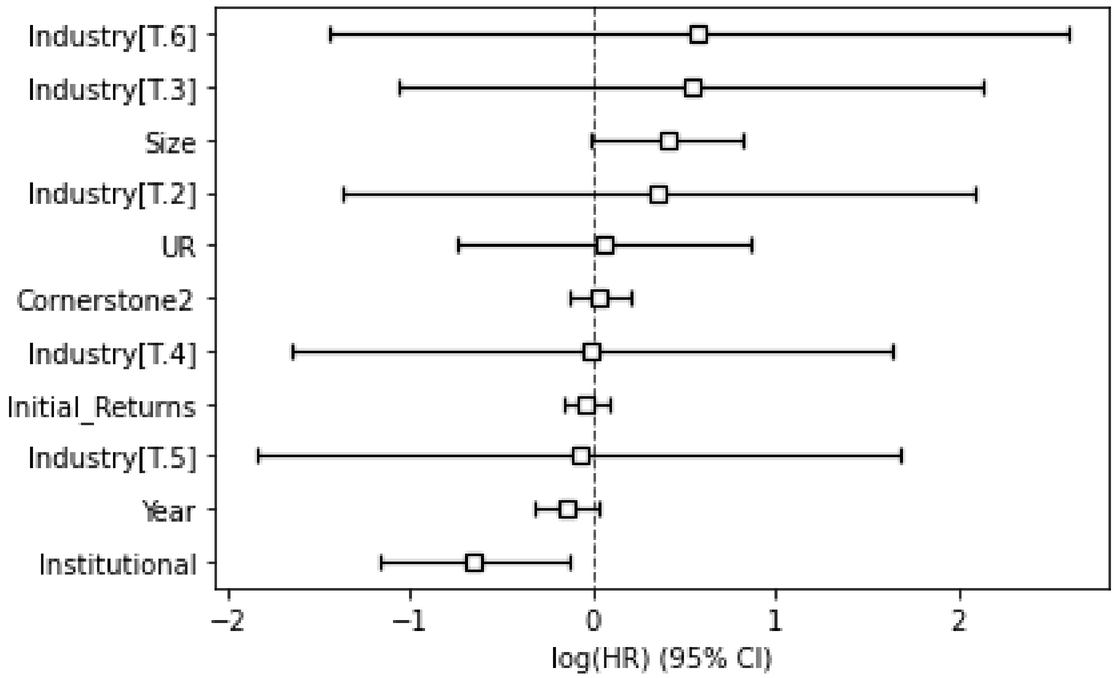

Figure A2: Cox proportional model for number of cornerstone dimension

Model 3

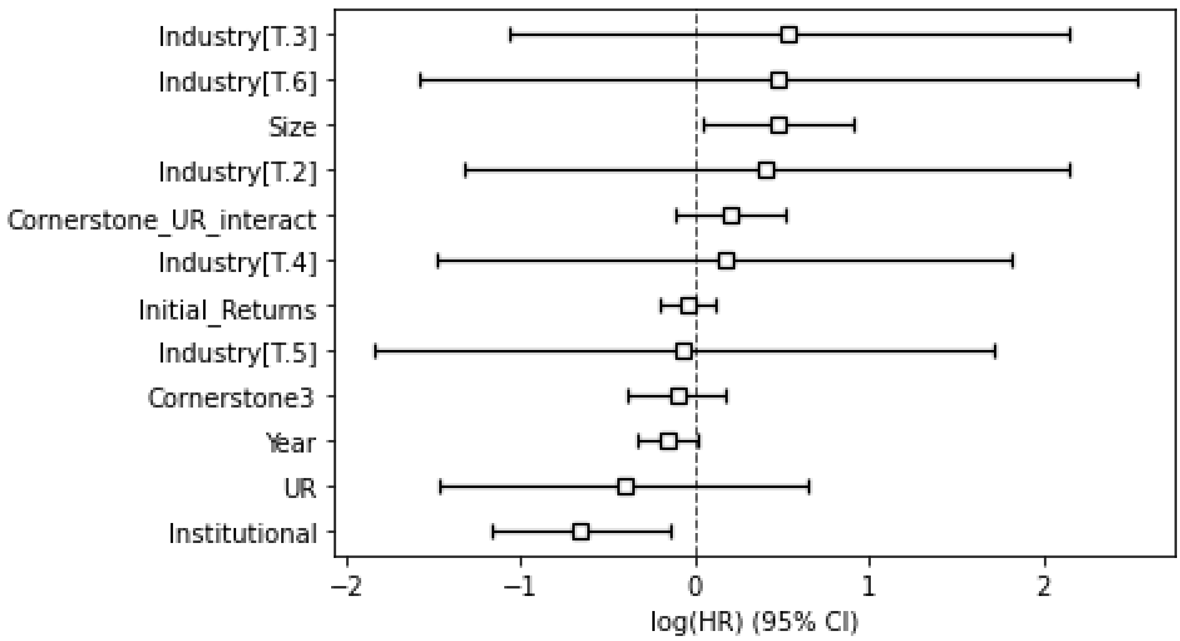

Figure A3: Cox proportional model for proportion of board independent investors dimension

Model 4

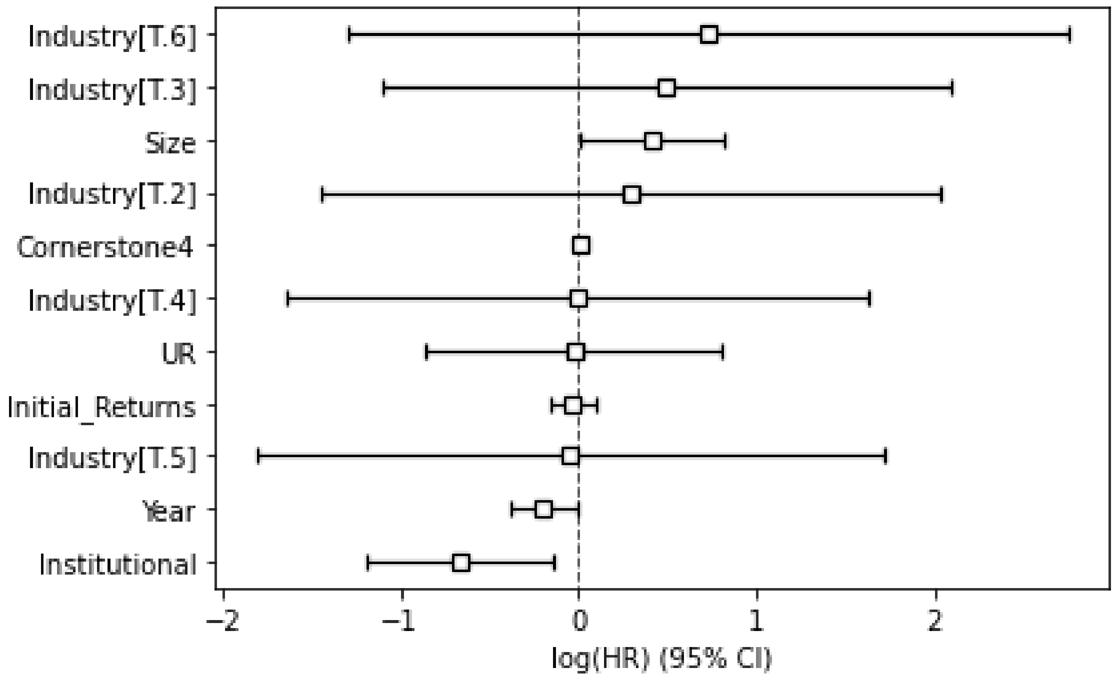

Figure A4: Cox proportional model for the proportion of share allocation dimension