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**The influence of financial sponsors on the post-IPO  
performance: Evidence from the Nordics**

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**ABSTRACT:**

This thesis investigates how financial sponsorship affects the performance of initial public offerings (IPOs) in the Nordics. The analysis covers both short-term underpricing and long-term stock performance, examining whether sponsorship influences both outcomes.

The research focuses on IPOs listed between 2013 and 2022 in Finland, Sweden, Norway, and Denmark. Sponsored IPOs are defined as offerings where a financial sponsor (PE or VC) held an ownership stake pre-listing. Short-term performance is measured through first-day returns (underpricing), and long-term performance is measured using Buy-and-Hold Abnormal Returns (BHAR) over a 36-month post-IPO period.

The final sample comprises 270 IPOs, of which 109 are classified as sponsored and 161 are non-sponsored. The study employs a multivariate regression model for underpricing and BHAR both to evaluate differences in performance while controlling for firm-specific factors such as size, leverage, and market timing. Long-term returns are benchmarked against the MSCI Nordic Countries index, which includes listed companies only from the same countries as our IPO sample consists of.

While existing literature has examined the effects of sponsor backing in IPOs, studies focused on the Nordic region remain scarce, and this thesis aims to fill that gap by providing empirical evidence with new data.

The results of this study show no strong or consistent evidence that financial sponsorship affects IPO underpricing. While some models suggest marginal significance for reduced underpricing when controlling for size and leverage, the full model does not support this finding. In the long-term analysis, sponsored IPOs do not appear to outperform non-sponsored ones, although some indications of worse performance emerged; these results were not consistent across all models. What this study found was that IPOs conducted during hot market periods consistently had higher underpricing and underperformed over the 36-month post-listing period, likely due to initial overvaluation and investor sentiment at the time of the issuance.

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**KEYWORDS:** IPO, Initial Public Offering, Long-term Performance, Financial Sponsor

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**TIIVISTELMÄ:**

Tämä pro gradu -tutkielma tarkastelee, kuinka taloudellinen sponsorointi vaikuttaa listautumisantiin (IPO) osallistuvien yritysten osaketuottoihin Pohjoismaissa. Analyysi kattaa sekä lyhyen aikavälin alihinnoittelun että pitkän aikavälin tuottokehityksen ja selvittää, vaikuttaako sponsorointi näihin kahteen asiaan.

Tutkimus keskittyy vuosina 2013–2022 Suomessa, Ruotsissa, Norjassa ja Tanskassa toteutuneisiin listautumisiin. Sponsoroiduiksi IPO:iksi määritellään ne listautumiset, joissa taloudellinen sponsori (pääomasijoittaja tai Venture Capital-sijoittaja) omisti osuuden yrityksestä ennen listautumista. Lyhyen aikavälin suorituskykyä mitataan ensimmäisen pörssipäivän tuotolla (alihinnoittelu), kun taas pitkän aikavälin kehitystä arvioidaan Buy-and-Hold Abnormal Returns (BHAR) -menetelmällä 36 kuukauden ajanjaksolla listautumisen jälkeen.

Tutkimusaineisto koostuu 270 listautumisesta, joista 109 on luokiteltu sponsoroiduiksi ja 161 ilman taloudellista sponsorointia toteutetuiksi. Eroja listautumisten tuottokehityksessä analysoidaan monimuuttujaregressiomalleilla sekä alihinnoittelun että BHAR-mittarin osalta. Malleissa kontrolloidaan yrityskohtaisia tekijöitä, kuten yrityksen kokoa, velkaantuneisuutta ja markkina-ajoitusta. Pitkän aikavälin tuottoja verrataan MSCI Nordic Countries -indeksiin, joka koostuu samoista maista kuin tutkimuksen IPO-aineisto.

Vaikka aiemmassa kirjallisuudessa on tarkasteltu sponsoroinnin vaikutuksia listautumisiin, Pohjoismaita koskevaa empiiristä tutkimusta on saatavilla vain vähän. Tämän tutkielman tavoitteena on osaltaan paikata tätä aukkoa tarjoamalla uutta aineistoon perustuvaa näyttöä.

Tutkimuksen tulosten perusteella taloudellinen sponsorointi ei näyttäisi vaikuttavan johdonmukaisesti alihinnoitteluun. Vaikka joissakin malleissa havaittiin viitteitä vähäisemmästä alihinnoittelusta sponsoroinnin yhteydessä yrityksen koon ja velkaantuneisuuden huomioon ottamisen jälkeen, tämä havainto ei säilynyt täydessä regressiomallissa. Pitkän aikavälin tarkastelussa sponsoroidut listautumiset eivät tuottaneet paremmin kuin ei-sponsoroidut, mutta tulokset eivät kuitenkaan olleet tilastollisesti merkittäviä eri mallien välillä. Tutkimuksen selkein ja johdonmukaisin havainto oli se, että kuumina markkinajaksoina toteutetut listautumiset olivat keskimäärin voimakkaammin alihinnoiteltuja ja tuottivat heikommin 36 kuukauden seurantajakson aikana. Tämä viittaa mahdolliseen alkuperäiseen yliarvostukseen ja sijoittajasentimentin vaikutuksiin listautumishetkellä.

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**AVAINSANAT:** Listautumisanti, Alihinnoittelu, Pitkän aikavälin tuotto, Pääomasijoittaja

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## 1 Introduction

Initial public offerings represent the moment companies go from private to public. Initial public offerings have been studied extensively in the past by academics and continue to be a central topic in today's research. IPOs include certain anomalies, for instance, initial underpricing, which contrasts with the efficient market hypothesis, stating that the listing price should already represent the true value of the company (Ritter 1984). The underpricing of IPOs has been widely researched by academic research, with the majority of existing studies focusing on the US markets or European markets.

The motivation for this thesis comes from the gap in research regarding the Nordic IPO performance. The effect of financial sponsors on the performance of Nordic IPOs is under-researched, even though the Nordic markets are mature and developed further than most markets (Nordic Securities Association, 2022).

IPOs' performance on a long-term and short-term basis has been a subject of interest for both researchers and investors. Short-term performance is often studied as the underpricing of the IPO, which means the stock return during the first trading day on the public market. According to the study by Ritter and Welch (2002), out of the IPOs between 1980 and 2001, approximately 94% exhibited positive returns during the first trading day. Supporting these findings, Mogilevsky and Murgulov (2012) find evidence of significant underpricing for stocks on US markets between 2000 and 2009. Additionally, the authors found that the level of underpricing differs among venture capital, private equity, and non-sponsored IPOs. According to Mogilevsky and Murgulov (2012), private equity-backed IPOs are less underpriced than other IPOs. Consistent with Mogilevsky and Murgulov (2021), Levis (2011) studied UK IPOs and found that private equity-backed firms exhibited significantly lower levels of underpricing and superior long-term performance compared to non-sponsored peers. In the European context, Bergström et al. (2006) examined European IPOs. They found that private equity-backed firms not only experienced lower underpricing but also delivered stronger post-IPO stock returns than companies without financial sponsors.

Similarly, to the study by Mogilevsky and Murgulov (2012), the long-term performance of IPO is influenced by the ownership structure before the listing, particularly whether the IPO is financial sponsor or non-sponsor-backed, for instance, according to the findings by Matanova et al. (2022) and Bergström et al. (2006).

Moreover, Levis (2011) demonstrated that sponsor-backed IPOs tended to outperform market benchmarks over the three years following the IPO, while Bergström et al. (2006) reported consistent evidence of long-term outperformance among European PE-backed IPOs.

## **1.1 Purpose of the study**

The purpose of the study is to examine the IPO activity and the effects of financial sponsor ownership in the Nordic IPO market. In the thesis, the Nordic countries include Finland, Sweden, Norway, and Denmark.

Globally, the performance of IPOs has been studied extensively (Levis, 2011; Ritter & Welch, 2002; Ritter, 1991), yet the performance of financial sponsor-backed IPOs in the Nordic region has not. With newly collected data, this thesis aims to conduct extensive research on the effects of sponsor involvement on the performance of post IPO companies in the Nordic stock markets, both in the short-term underperformance and long-term performance. While the literature often distinguishes between private equity (PE) and venture capital (VC) backing, this thesis uses the term “sponsor” to refer to both types of financial backing interchangeably

## 1.2 Hypotheses

This thesis investigates the performance of financial sponsors backed initial public offerings (IPOs) in the Nordic markets, focusing on two dimensions: short-term underpricing and long-term post-IPO performance. In the thesis, following the literature (Levis, 2011), the long-term period is 36 months, and the term financial sponsors consists of venture capitalists and private equity. The aim is to evaluate whether financial sponsorship affects IPO pricing efficiency and aftermarket performance compared to non-sponsored IPOs.

The existing literature presents an interesting finding that the pre-IPO ownership structure matters for the level of underpricing in the IPO. For instance, in the study by Levis (2011), private equity IPOs are documented to exhibit less underpricing. Consistent with the findings by Levis (2011), Bergström et al. (2006) find that European sponsor-backed IPOs exhibit less underpricing compared to other IPOs on the European markets. Thus, the first hypothesis of the thesis is developed as follows.

H1 : Sponsored IPOs in the Nordic region exhibit significantly lower underpricing than non-sponsored IPOs.

The second hypothesis of the thesis seeks to find whether financial sponsor backing pre-IPO translates to better long-term return compared to IPOs without a sponsor. According to the literature, the long-term performance of private equity-backed IPOs is better than their non-backed counterparts (Levis, 2011; Matanova et al., 2022; Cao & Lerner, 2009).

On the other hand, the findings on VC-backed IPO performance are somewhat mixed; for instance, the study by Bessler & Seim (2012) finds that VC-backed IPOs outperform non-VC-backed IPOs. In contrast, according to Levis (2011) and Matanova et al. (2022), the VC-backed IPOs are not performing better than other IPOs. Although the results are mixed, the thesis specifically focuses on the impact of financial sponsors, both PE and VC, on long-term IPO performance. Therefore, the following hypothesis is presented.

H2 : Sponsor-backed IPOs in the Nordic countries deliver significantly higher 36-month post-IPO returns compared to non-sponsored IPOs.

### **1.3 Research gap**

Although some research has examined the effect of financial sponsors on IPO underpricing and long-term performance, most studies have focused on larger stock markets, such as the United States (e.g., Ritter, 1991; Megginson & Weiss, 1991; Loughran & Ritter, 1995; Cao & Lerner, 2009; Ritter & Welch, 2002). As a result, there may be limited understanding of how these IPO ownership dynamics play out in smaller, less frequently studied markets such as the Nordics. The thesis's focus on the Nordic stock markets constitutes the geographical part of the research gap. The geographical research gap is supported by the newly collected IPO data, that is gathered between 2013 and 2022. However, there have been a few master's theses on the topic of the performance of financial sponsor-backed IPOs in the Nordic region. This thesis addresses similar themes and contributes a novel perspective through the use of more recent data and a distinct methodological approach.

### **1.4 Structure of the study**

The thesis is structured into several chapters. In the first section, the introduction of the thesis is presented along with the purpose of the study, the hypothesis of the study, and lastly, the structure of the study. The second section of the thesis captures the diverse and relevant financial theories, along with introducing the concepts of financial sponsors: venture capital and private equity. The third section discusses initial public offerings in detail, as they are the core of the thesis. Lastly, the academic literature researching IPO performance is presented in this section.

After the theoretical part, the empirical part of the thesis consists of the fourth, fifth, and sixth sections. The fourth chapter is on data & methodology, the fifth chapter presents the empirical results of the thesis, and lastly, the sixth chapter is dedicated to the conclusion.

### **1.5 Joint thesis clause**

Both authors contributed equally to the research, writing, and finalization of this thesis. The work presented here reflects joint efforts and shared responsibility across all stages of the thesis process.

## **2 Theoretical background**

The performance of sponsor-backed IPOs can be analyzed through several complementary finance theories. These theories provide insights into why sponsor-backed companies might exhibit distinctive short-term and long-term stock return patterns relative to other IPOs. For instance, agency theory, information asymmetry, signaling theory, market timing theory, and pecking order theory each offer explanations for IPO phenomena such as initial underpricing and post-IPO return performance. This section discusses these theories and critically examines how the theories help explain the stock performance of sponsor-backed IPOs.

By synthesizing recent academic findings, this study builds a theoretical foundation for understanding short-run IPO returns, such as first-day stock jumps, and long-run performance, such as three-year abnormal returns of financial sponsor-backed firms.

### **2.1 Agency theory and governance**

Agency theory (Jensen & Meckling, 1976) explains that conflicts between a firm's owners (principals) and managers (agents) can give rise to agency costs, which in turn may reduce firm value. This is particularly relevant in the IPO context, where ownership and control begin to separate more distinctly. Under sponsor ownership, agency costs are generally lower, as sponsors, private equity or venture capital firms typically hold significant stakes, actively monitor management, and provide strong incentives to align interests (Jensen, 1989; Barry et al., 1990). In the case of PE firms, high leverage and concentrated ownership serve as additional governance mechanisms that reduce excess cash flow and managerial discretion (Jensen, 1986). Similarly, VC firms mitigate agency costs through staged financing, board representation, and strategic involvement (Gompers, 1995; Hellmann & Puri, 2002).

Empirical studies show that sponsor-backed firms tend to establish formal governance controls before an IPO, many of which persist after listing as legacy structures (Cao & Lerner, 2009). According to Jensen and Meckling's framework (1976), such active ownership and monitoring can reduce principal-agent conflicts and potentially improve post-IPO firm performance.

However, when a sponsor-backed company goes public, ownership becomes dispersed, creating new agency problems. With more diversified ownership, shareholders might hesitate to bear monitoring costs, creating a free-rider problem (Grossman & Hart, 1980). As a result, managers gain more freedom, possibly prioritizing personal or growth objectives over shareholder interests, which can lower the value of the company. If the sponsor completely exits soon after the IPO, the risk of lower oversight increases significantly naturally. Research has found that IPO companies with insider ownership or large shareholders typically perform better in the long run (Brav & Gompers, 2003). In PE-backed IPOs, sponsors often retain a meaningful stake during lock-up periods, reassuring investors that good governance will continue (Barry et al., 1990). Studies also confirm that continued involvement, such as board seats or advisory roles by PE firms, helps sustain performance after IPO (Baker & Gompers, 2003; Kaplan & Strömberg, 2009). This governance helps minimize agency costs, contributing to post-IPO value creation.

Furthermore, PE-backed IPOs often carry high debt from a leveraged buyout if the initial PE acquisition was carried out with a lot of external debt. According to Jensen's free cash flow hypothesis, debt disciplines management, forcing them to prioritize interest payments over less profitable investments (Jensen, 1986). Empirical research by Levis in 2011 supports this, finding a positive relationship between leverage at IPO and long-term returns in PE-backed companies. Non-PE-backed IPO returns depend more on managerial efficiency than on leverage. Thus, the combination of equity incentives, concentrated ownership, and leverage in PE governance positively affects company performance post-IPO. In addition to the financial structure, PE-backed companies usually enter the market with professional management and optimized operations (Achleitner et

al., 2010), which contribute to better performance and lower failure rates compared to other IPOs (Cao & Lerner, 2009).

However, agency theory also highlights possible downsides. For example, if sponsor oversight ends too quickly, a governance gap can occur. Cumming and MacIntosh (2001) report venture-backed firms performing worse after venture capitalists exit due to reduced monitoring. Similar effects may happen in PE-backed IPOs if sponsors exit soon after the IPO. Empirical evidence shows that stock prices can drop after lock-up periods when investors see the PE sponsor's exit as signaling no further improvements (Katz, 2009). Additionally, while high debt can improve efficiency, it also increases financial risk, especially during downturns, harming long-term performance. Thus, agency theory reveals both benefits and risks: PE-backed IPOs initially benefit from good governance, but maintaining this advantage depends on continuous oversight from large shareholders or institutional investors.

## **2.2 Information asymmetry**

Information asymmetry between company insiders and outside investors is critical in IPOs. Before going public, insiders have more information about the company than external investors. Signalling theory (Spence, 1973) argues that companies can send credible signals to show quality, reducing information gaps. For instance, IPO underpricing, where shares are initially sold below market value, can signal quality (Allen & Faulhaber, 1989). Only strong firms can afford this strategy, confident of higher future valuations, making underpricing an effective signal of quality.

In the context of venture capital-backed IPOs, Megginson and Weiss (1991) argue that the presence of a reputable VC serves as a certification mechanism. VCs play an active role in governance, provide hands-on support, and have reputational capital at stake, thereby reducing information asymmetry. Lerner (1994) highlights further that VC involvement enhances IPO quality through staged financing and board control, while Hsu

(2004) demonstrates that founders value VC reputation as a market signal, even accepting lower valuations to affiliate with top-tier firms.

In PE-backed IPOs, the sponsor's involvement also signals quality and readiness. Preparing a firm for IPO is a resource-intensive process, and PE sponsors often lead efforts to improve governance, financial reporting, and strategic positioning. Reputation is critical for sponsors, and failed IPOs could damage their future deal flow, incentivizing high-quality preparation (Carter & Manaster, 1990). Studies confirm that PE-backed IPOs often show lower underpricing due to reduced investor uncertainty (Levis, 2011; Bergström et al., 2006).

Specific signals like retained equity stakes by PE sponsors also help reduce information asymmetry as larger retained stakes signal confidence in future stock performance (Leland & Pyle, 1977). Research indicates that IPOs with substantial retained stakes often perform better long term (Aggarwal, Bhagat, & Rangan, 2009). Conversely, if sponsors sell large stakes, investors might interpret negatively, pushing stock prices lower post-IPO (Brau et al., 2003). Thus, PE-backed IPOs often deliberately retain meaningful ownership to avoid sending negative signals.

The choice of reputable underwriters also serves as an important signal. High-quality IPOs usually hire prestigious banks, signaling thorough vetting (Carter & Manaster, 1990). Additionally, transparent financial disclosures and forecasts further signal quality and confidence, especially common among professionally managed PE-backed firms that have put a lot of effort into the IPO-readiness.

However, investors might still doubt PE sponsors' intentions, as sponsors aim to maximize exit returns. Therefore, multiple consistent signals (reputable sponsor, significant retained stake, moderate underpricing, strong financials) are critical to reassure investors. If signals conflict, investors might remain cautious. Jakobsen and Sørensen (2001) indicate that no single signal completely resolves IPO valuation uncertainty, explaining

persistent IPO underpricing. Overall, PE and VC-backed IPOs benefit from reduced information asymmetry through strong signaling and certification, potentially leading to accurate pricing and stable long-term performance.

### **2.3 Market timing theory and IPO windows**

Market timing theory suggests that companies choose to issue equity when market conditions are favorable, such as when valuations are high, investor sentiment is positive, and liquidity is easy to obtain. Firms aim to capitalize on these conditions to achieve higher prices than might be justified by their fundamentals (Baker & Wurgler, 2002). Ritter (1991) found that IPOs in the US often underperform in the long run, partly due to firms timing their IPOs during optimistic market periods. These findings are supported in the European context by Berström et al. (2006). It is explained that during these "hot" market windows, many IPOs are overvalued because of temporary investor enthusiasm, leading to long-term underperformance when valuations normalize.

The "hot" market effect is well documented in short-term underpricing literature. Ibbotson and Jaffe (1975) first found that IPOs issued during these hot periods experience more underpricing, later backed by Loughran and Ritter (2002) in the US and by Bergström et al. (2006) in Europe.

For private equity (PE)-backed IPOs, market timing is particularly relevant. PE sponsors strategically manage the timing of their exits and typically prefer IPOs during bullish markets to achieve better valuation multiples. Empirical studies support this tendency, showing increased IPO activity and higher initial returns during hot market periods (Lerner, 1994). However, such timing can also lead to subsequent underperformance if initial valuations are excessively high.

In the venture capital context, Gompers (1996) highlights that younger VC firms may push portfolio companies to go public earlier, particularly during favorable market

windows to establish a track record and attract future fundraising, a phenomenon known as grandstanding. However, such timing strategies may lead to overvaluation at the IPO stage and potential underperformance post-listing if fundamentals lag behind investor expectations.

## **2.4 Pecking order theory and financing decisions**

The Pecking order theory (Myers & Majluf, 1984) proposes that companies prefer internal financing first, then debt, and equity issuance only as a last resort due to the negative signaling effects of new equity issues. IPOs, viewed through this theory, might indicate firms have exhausted internal resources and debt options or see an opportunity to sell equity at favorable valuations.

PE-backed firms often carry higher debt loads following leveraged buyouts, and IPOs are frequently used as a mechanism to deleverage and rebalance the capital structure (Cao & Lerner, 2009). The IPO thus often involves issuing new shares (primary issuance) to repay debt, improving the company's financial health. On the other hand, IPOs primarily featuring secondary shares, where PE sponsors sell their stakes without raising new capital for the company, might signal weaker future performance due to reduced confidence by insiders (Field & Hanka, 2001). As Megginson and Weiss (1991) note in the context of VC-backed IPOs, retained ownership by financial sponsors acts as a credibility signal, as when sponsors significantly reduce their holdings at the IPO, it can weaken market perceptions of firm quality and long-term performance potential.

Empirical evidence suggests that PE-backed IPOs generally use IPO proceeds to de-leverage and strengthen their financial standing, positively influencing long-term returns (Degeorge & Zeckhauser, 1993). However, IPOs dominated by secondary shares may indicate less favorable future performance.

In conclusion, both the market timing theory and the pecking order theory help to understand IPO performance. Market timing shows that IPOs done during very active or “hot” markets can carry risks in the long run. Pecking order theory explains that it is important to look at why companies decide to go public, especially when it comes to changes in capital structure or insiders selling their shares.

## **2.5 Financial sponsors**

In existing literature, venture capital and private equity investors are typically referred to as financial sponsors (Kaufman et al., 2024). Consistent with the literature, a similar approach is followed in the thesis. As the financial sponsors have an important role in pre-IPO financing and strategic development of companies, the following subchapters discuss the characteristics of both types of investors and their approaches to IPOs.

### **2.5.1 Private Equity**

One way to understand private equity (PE) is as a type of investment in which one acquires ownership interests in privately held businesses to produce financial returns. PE firms invest in private companies, usually using a range of financial mechanisms to increase value before finally exiting the investment through Initial Public Offerings (IPOs), trade sales, or secondary buyouts.

Unlike publicly traded equities, which can be purchased and sold on an exchange and are quite liquid in a sense, PE investments are long-term, illiquid, and demand significant investor commitment to drive operational improvements and strategic development (Kaplan & Strömberg, 2009). Studies have shown that PE funds have regularly yielded better returns than the S&P 500, especially in the period from the 2000s to the 2020s, when they showed a higher compounded annual growth rate (CAGR) (Jahn, 2022). Private equity has thus become a strong financial tool that beats conventional public

market investments, and the hands-on involvement and governance improvements often associated with PE funds may explain their historical outperformance (Kaplan & Schoar, 2005). More broadly, PE firms often aim to unlock value in underperforming firms through restructuring, operational improvements, and by freeing them from public market pressures (Guo et al., 2011; Jensen, 1989).

### **2.5.2 Private Equity structure**

Private equity (PE) funds are typically structured as limited partnerships, where investors, known as Limited Partners (LPs) commit capital to be managed by General Partners (GPs), who take responsibility for sourcing deals, making investment decisions, and overseeing portfolio companies (Kaplan & Strömberg, 2009). LPs, such as pension funds, insurance firms, or sovereign wealth funds, provide the bulk of capital but remain passive in day-to-day operations (Baldwin, 2021).

Usually, spanning 10 to 12 years, the PE fund's investment process can be divided into different sections. GPs collecting cash from LPs that will be drawn down over the investment period is part of the fundraising stage, which usually lasts a year. The investment period lasts for the first five to six years, during which time capital is committed to certain businesses via acquisitions or so-called equity injections. From years three to ten, the management and value creation phase consists of funds actively managing and improving portfolio firms through operational and management improvements. Between years five and twelve comes the exit and divestment phase, which consists of liquidating the investments through an IPO, trade sales, or secondary buyouts. (Metrick & Yasuda, 2010).

### **2.5.3 Private Equity investment process**

Private equity's investment process is methodological. Deal sourcing and screening is the first stage where PE companies find possible investment opportunities, for instance, via

investment banks, consulting firms, or competitive auctions. Once a target is found, a thorough due diligence process is started, assessing financial, operational, and legal elements to assess the company's risk and expansion possibilities (Kaplan & Strömberg, 2009).

The next vital phase is active portfolio management, in which PE corporations apply strategy initiatives, streamline financial systems, and improve the overall governance inside portfolio companies (Kaplan & Strömberg, 2009). PE companies are essential in helping businesses towards long-term value development; hence, this active strategy distinguishes PE from passive stock purchases. Executing an exit strategy, which can be an IPO, trade sale, or secondary buyout, is the last phase. This phase aims to maximize returns while lowering investment risk, hence strengthening the position of PE companies as active rather than passive investors. The timing of departures is critical since the pricing and profitability of the sale of stocks can be much influenced by market conditions. Maximizing returns must be balanced with making sure portfolio companies are ready for life following private ownership. (Kaplan and Strömberg, 2009)

As the private equity structure and operating model are described in the chapters above, the following chapters will discuss an important subcategory of private equity, venture capital, in more detail. In the thesis, financial sponsors are defined to include both PE and VC investors, given their shared characteristics as professional investors and the somewhat similar approaches they employ in identifying, funding, and managing investment opportunities. They do, however, exhibit significant differences, which are described in more detail in the following subchapters.

#### **2.5.4 Venture Capital structure**

In this subchapter, the characteristics of Venture Capital are discussed. Venture capital, or in short VC, is a subset of private equity focusing on early-stage companies with high growth potential but uncertain future cash flows. Unlike PE, which often invests in

mature businesses, VC firms provide capital to startups in exchange for equity stakes. These investments are riskier but offer higher potential returns if successful (Gorman & Sahlman, 1989). The attractive growth potential and innovation can increase the expected return of the stock of company. According to the study by Michala (2016), the significant growth potential of early-stage companies is typically based on the premise that these firms are either highly innovative or possess novel technological advancements.

Moreover, Kaplan and Strömberg (2009) note that private equity firms often aim to acquire a substantial ownership stake in their target companies, enabling them to exert greater control over strategic and operational decision-making. This is a key difference between the operating models that private equity and venture capital professionals operate by. In other words, venture capital firms seldom acquire a majority stake in target companies, whereas private equity firms typically obtain a controlling interest.

Another unique trait of a VC compared to a PE is the focus on early-stage companies. According to Andersin (2021), VC funds typically follow a staged financing approach, with initial seed funding followed by successive funding rounds that have been named. The author further notes that it is typical for successful start-ups to have multiple funding rounds, each designated for a specific stage in the company's development. Along with the substantial funding, according to Andersin (2021), VC firms provide other services, for instance, strategic guidance, mentorship, and access to networks that help startups scale.

As discussed in the chapter above, VCs allocate capital between various early-stage companies. Out of the different investment styles or investment categories, early-stage investing can be seen as the riskiest. These early-stage investments must offer attractive expected returns for higher risk and lower liquidity.

The recent book by Andersin (2021) deals with the VC industry, structure, and professional investors. According to the author, most venture capitalists manage their investments through dedicated venture capital funds. Venture capital funds are structured as limited partnerships. In the book, Andersin (2021) states that a limited partnership consists of a general partner (GP) and at least one limited partner (LP). According to the author, the VC fund manager operates as a general partner, and the investors who contribute capital to the fund are limited partners.

Furthermore, Andersin (2021) states that VC funds have multiple limited partners as investors in the fund. This is logical, as the operative model of VC funds allows the funds to raise capital from a broad base of investors, ensuring that enough capital for the necessary investments is raised. According to the author, the limited partners of these funds are often wealthy investors, such as family offices, wealthy individuals, or, especially in Finland, pension funds, etc. Typically, the characteristics of venture capital funds, including their high risk, substantial minimum investment requirements, lack of liquidity, extended investment horizons, etc., render them unsuitable for retail investors.

Moreover, the general partner is responsible for managing the capital collected from the limited partners in line with the fund's operating agreement. In practice, this means making VC investments based on the principles outlined in the fund agreement, to optimize the returns for investors in the fund (Andersin (2021).

### **2.5.5 Venture Capital investment process**

Venture Capital investments have different stages, and the following subchapter discusses these stages and the difficulties of decision-making. Traditionally, investment has been divided into multiple phases. According to Andersin (2021), the first investment phase is the pre-seed financing round. In this stage, the company founders invest in the company, and VC is not yet involved.

According to the author, the next stage is the seed financing round, where the financing is typically raised from third-party investors. The startup could need capital to finalize a new product or innovation, or any other important business expenditure. At this stage, the company has no significant revenue but might already have customers. According to Andersin (2021), Finnish startups typically raise between 200,000 euros and 1 million euros in this stage.

After the seed financing round comes Series A and B financing. According to Andersin (2021), the series A financing round is the first significant financing round. The author further notes that a startup is considered ready for an A-round once it has demonstrated revenue, indicating market demand for its product or service. At this stage, the capital raised is primarily allocated toward expanding the business, hiring additional personnel, and advancing product development, sales, and marketing efforts. In the book, Andersin (2021) notes that for startups in Finland, A-round funding typically ranges from one to five million euros.

On the other hand, a startup is ready for a B-round when it can demonstrate stable business operations, even if it may still be unprofitable, Andersin (2021). According to the author, the B-round funds enable the company to scale its operations significantly and increase revenue. This typically involves hiring more staff, increasing investment in sales and marketing, and expanding internationally. Lowering product or service prices may serve as a strategy to accelerate customer acquisition. Additionally, Andersin (2021) states that Finnish startups generally raise several million to tens of millions of euros in a B-round.

Lastly, Andersin (2021) notes that startups may continue raising funds through later rounds or a pre-IPO round. These rounds aim to drive growth through market expansion or acquisitions. Each round may introduce new classes of shares with different financial or administrative rights. The size of funding rounds has generally increased globally, and

startups typically raise new rounds about every 18 months, provided they meet the milestones set in previous rounds Andersin (2021).

According to Gregoriou et al. (2006), the exit strategy for VC firms is vital from a capital gains perspective, as the companies in which VCs are invested aren't typically paying dividends. Therefore, divestments of assets, also known as exits, are venture capitalists' way to make money from their investments. The IPO process is one way for VCs to exit their investments partially or wholly.

In their study, Kaplan & Strömberg (2009) find that historically, IPO has not been the most common exit strategy for professional investors. The authors note that between 1970 and 2007, only 14% of the exits were conducted by IPO. Based on the research, more common exit strategies were selling to a strategic buyer and secondary buyouts.

From an investor's perspective, the presence of venture capital in the IPO process might signal company quality and promising growth prospects. According to the study conducted by Daily et al. (2003), VC involvement raises the certainty for retail investors about the IPO prospects because VCs are active owners who help the company management achieve higher performance. According to the study by Daily et al. (2003), professional owners such as venture capitalists are active as owners. The authors further argue that VCs offer strategic guidance to management and facilitate access to key stakeholders such as financiers.

According to Daily et al. (2003), the involvement of venture capitalists might affect the IPO pricing. The authors hypothesize that there might be a lower probability of underpricing when a VC holds a significant ownership stake in the company going public. The underpricing of an IPO makes the investment at the offering price more attractive from the new investor's perspective. For the company's owner, a lower valuation during the IPO is unfavorable, as it reduces the proceeds from share sales. The underpricing of an IPO is discussed further in the next chapter of the thesis.

### 3 Initial Public Offerings

Uncertainty is inherent in the stock market, shaping investor behavior and driving market volatility. Stock prices react to company-specific news but also to broader economic indicators, central bank policies, geopolitical tensions, and tariffs. Therefore, the cyclical nature of the stock market and the broader economy has an impact on the IPO market. As the IPO is an exit strategy for private equity of venture capital investors, the market sentiment plays an important role in deciding which exit strategy to choose. For instance, according to Jenkinson and Sousa (2015), the IPO is more likely an exit strategy when the equity markets are strong and offer high valuations; in contrast, the authors state that PE owners prefer secondary buyouts when interest rates are low and debt is abundant, as these secondary buyouts exist with more certainty than IPOs.

As the stock prices reflect investors' expectations of future discounted cash flows, the companies going public have a financial incentive to present an optimistic view of the company's growth prospects to a certain limit. According to Arthurs et al. (2009), the anomaly of underpricing of an IPO stems from the uncertainty that a company deciding to go public faces. To compensate for the uncertainty, investors demand a higher return on the IPO, which can be seen as rational investor behavior. On the other hand, an underpriced IPO will also lure in more investors and thus improve the likelihood of a successful IPO.

Underpricing means that the company deciding to go public will miss potential revenue that could have been raised had the shares been priced more accurately. Arthurs et al. (2009) note that the uncertainty leads to the phenomenon of money left on the table, which is discussed further in the following subchapter. The following sub-chapters discuss the anomalies surrounding the price of an IPO in more detail and present a concept of IPO lockup, which can play a vital role in building investor confidence and reducing uncertainty.

### 3.1 IPO offer price

Much research has been conducted on the pricing of IPO. According to the study by Ritter & Welch (2002), the primary objectives of an IPO are to raise capital for the company deciding to go public and to enable the company owners to diversify some of their wealth through selling some of the shares via a public stock exchange. The focus of academic literature has been on studying the underpricing of IPOs. According to Ritter & Welch (2002), IPO underpricing can be measured by first-day returns.

According to the study by Daily et al. (2003), the underpricing of an IPO has been a rather common phenomenon. For instance, Ritter & Welch (2002) argue that approximately 70 percent of all IPOs make positive returns on the first trading day. The IPO is underpriced when the initial offer price is below the closing price of the first trading day. The authors of the study note that the US markets' IPOs between 1980 and 2001 produced an average of around 18 percent opening trading day returns. Furthermore, in their study, Ritter & Welch (2002) note that in their sample of 6249 IPOs from 1980 to 2001, the average first-day performance is 18,8 percent.

In other words, for the IPO to be underpriced, the closing price of the first day must be higher than the offering or opening price of the first day. Therefore, to measure the significance of the underpricing, the following formula is presented:

$$UP (\%) = \left( \frac{\text{first-day closing price} - \text{initial offer price}}{\text{initial offer price}} \right) \times 100\% \quad (1)$$

This formula calculates how much a share will return on percentage terms on its first day on the stock market. The underpricing formula presented above is an essential part of the methodology of the first hypothesis of the thesis. Another relevant formula is the market-adjusted formula for underpricing. The market-adjusted underpricing formula aims to isolate the IPO's performance from general stock market trends:

$$M * \text{adjusted UP} = \left( \frac{\text{first-day closing price} - \text{initial offer price}}{\text{first-day closing price}} \right) - \text{market return} \quad (2)$$

To quantify the monetary value of IPO underpricing, a concept of 'money left on the table' (MLOT) is presented. The third formula of MLOT is used to estimate the financial cost of the underpricing.

$$\text{MLOT} = (\text{1st d closing price} - \text{initial offer price}) \times \# \text{ of shares sold in the IPO} \quad (3)$$

According to the study by Loughran & Ritter (2002), the underpricing of IPOs costs significant sums for companies going public, with the average amount reaching around 9,1 million USD. All in all, the underpricing phenomenon may highlight the inherent tension in IPO pricing. The offering must be attractive enough to appeal to new investors, while the pre-IPO shareholders seek to maximize the firm's value and, consequently, their returns.

### 3.2 IPO lockup

An essential feature in the IPO process is the lock-up period, which significantly shapes post-IPO market dynamics. According to the study by Bradley et al. (2001), the IPO lockup is an agreement that restricts insiders from selling their shares for a specific period, most often 180 days after the IPO. After the lockup, the company's insiders can sell their shares on the stock exchange.

The post-lockup period has been studied extensively by academics in financial research. A proven correlation between the stock price and lockup period has been detected. In the study by Arthurs et al. (2009), a sample of 640 companies doing IPO is analyzed. According to the authors, an IPO lockup period longer than the standard 180-day lockup period will reduce both uncertainty and underpricing. The findings of the study by

Arthurs et al. (2009) also indicate that a lengthier lockup period can serve as a substitute signal in IPOs where traditional credibility signals, such as venture capital and private equity backing or the presence of a prestigious underwriter, are absent or less pronounced.

Furthermore, with sponsor backing, an IPO can signal quality and prestige to investors. This quality factor should be reflected in the pricing of the IPO. Therefore, this study hypothesizes that PE and VC-backed IPOs are less underpriced than their non-backed counterparts. The ownership base of the firm has been found to affect the lockup period. For instance, according to the study by Bradley et al. (2001), the sponsor-backed IPOs are affected more by the expiration of the lockup period. At the lockup expiration, the authors find evidence of significant negative abnormal returns in stocks that have VC backing. Consistent with the findings of the study by Bradley et al. (2001), Field and Hanka (2001) find that the effect of negative returns after lockup expiration is stronger for the IPOs that are VC-backed. Fields and Hanka (2001) further observe that venture capitalists, as owners of IPO firms, tend to divest their holdings more aggressively than other types of shareholders after the firm has gone public. However, the literature also presents different research findings on this matter. For instance, according to a study on VC-backed IPOs by Megginson & Weiss (1991), the authors find that VCs keep a considerable share of their ownership in the company shares following the completed IPO. The authors further state that most VCs do not immediately sell the shares on the very first trading day.

Furthermore, trading activity has been found to increase after the lockup period. In the study by Fields and Hanka (2001), a 40 percent increase in mean trading volume is captured for the VC-backed companies. Similarly, Garfinkle et al. (2002) find a significant and permanent increase of around 45 percent in the trading volumes in an IPO after the last day of the lockup period.

In the following subchapter, the focus shifts to examining the performance of sponsor-backed IPOs. If such IPOs are less susceptible to underpricing, it becomes relevant to analyze how they perform in both the short term and long term relative to their non-sponsored counterparts that might face more significant uncertainty.

### **3.3 Short-term IPO performance of sponsor-backed companies**

In IPO research, short-term performance is usually assessed by the level of underpricing, measured as the first-day return or within the first weeks of trading compared to the closing price. A well-established general result is that IPOs, on average, have positive first-day returns, indicating underpricing (Ritter, 1984; Loughran & Ritter, 1995). In the Nordic markets, like elsewhere, newly listed shares often experience an initial price hike, rewarding IPO subscribers. In the thesis, the first hypothesis aims to answer the question of whether IPOs backed by financial sponsors differ in this regard from other IPOs.

The academic literature on IPO underpricing offers conflicting predictions: on one hand, PE- and VC-backed companies are typically larger, more mature businesses with extensive due diligence, which could reduce information asymmetry and underpricing. On the other hand, PE sponsors might accept some underpricing to ensure a successful offering and to maintain relationships with investors and underwriters, or to signal quality for future equity sell-downs.

Empirical evidence from recent studies leans toward lower underpricing for PE-backed IPOs compared to others. For instance, Mogilevsky and Murgulov (2012), examining 265 PE-backed IPOs in the U.S. between 2000 and 2009 against matched samples of venture-backed and non-sponsored IPOs, found that PE-backed IPOs had significantly lower first-day underpricing than both VC-backed and non-sponsored offerings. According to the authors, the average market-adjusted initial return for PE-backed issues was markedly lower, consistent with the idea that the presence of an experienced PE owner certifies the firm's value and reduces information risk for investors. Mogilevsky and Murgulov

(2012) further note that there may be an underpricing gap due to the bargaining power and reputation of PE sponsors: investment banks may price PE-backed IPOs more aggressively, as PE firms are repeat, lucrative clients whose satisfaction is crucial for the bank's future business. This perspective is supported in the study by Megginson & Weiss (1991), where the authors note that well-established VCs are often working repeatedly with the same underwriters, which reduces information asymmetry and establishes relationships, making the IPOs more appealing for institutional investors.

In effect, underwriters are less inclined to underprice when the issuer is a powerful PE or VC fund that will bring more deals in the future, tilting the usual IPO pricing equilibrium in favor of the issuer rather than the new investors. This finding aligns with the agency theory that underwriters face a multiple-agent problem balancing the interests of issuing shareholders and new investors, and that with PE sponsors, the issuing side has more bargaining power. To conclude, these findings support the hypothesis of this thesis, namely that venture capital and private equity-backed firms tend to leave less money on the table in initial public offerings, as evidenced by lower levels of underpricing.

Although the research usually shows reduced underpricing for PE-backed IPOs, results for VC-backed IPOs vary significantly. Brav and Gompers (1997) initially argued that due to a favorable signaling effect that reduces information asymmetry, VC-backed IPOs often exhibit less underpricing. However, their results did not fully support this argument as, when they controlled for company characteristics, they found no clear difference in underpricing between VC-backed and non-backed IPOs. Instead, their main finding was related to long-term performance as they found that VC-backed IPOs had better long-term returns, especially in the case of smaller and younger companies. This would mean that while VC support may not always help with pricing at the IPO, it seems to have a positive effect on company success in the years after the listing. Megginson and Weiss (1991) also offered evidence supporting the VC certification theory, finding that VC-backed IPOs had an average initial return of 7.1%, lower than non-VC-backed firms.

In contrast, Lee and Wahal (2004) discovered that VC-backed IPOs were generally more underpriced, particularly in speculative periods like the dot-com bubble. Similarly, Buchner, Mohamed, and Wagner (2019) showed that VC-backed IPOs are often more underpriced than buyout-backed IPOs. However, Francis and Hasan (2001) observed better first-day returns for VC-backed IPOs, indicating that underpricing may also reflect investor enthusiasm. These mixed findings suggest that the short-term pricing of VC-backed IPOs may be more sensitive to market cycles and sponsor behavior, particularly when younger VC firms push for early listings to gain reputational advantages (Gompers, 1997).

Studies focusing on Europe similarly report milder underpricing for PE-backed IPOs. For example, Bergström et al. (2006) analyzed 152 PE-backed IPOs versus 1,370 non-PE-backed IPOs across European markets. The authors found that the PE-backed group exhibited lower initial returns on average. According to the authors, the lower underpricing is due to reduced uncertainty about firm value, as PE-backed companies tend to be larger and more financially stable, so investors require a smaller discount to participate.

In addition, Bergström et al. (2006) discovered that issue size and timing have a strong effect on underpricing, sometimes larger than the effect of PE sponsorship itself. During hot market periods, even PE-backed IPOs might incur higher underpricing due to extremely high demand, whereas in colder markets, the pricing is more efficient. All in all, the findings of the study by Bergström et al. (2006) support the notion that having a PE backer is associated with less underpricing, all else equal.

Within the Nordic region specifically, there is evidence that mirrors these broader findings. For instance, a study of Swedish IPOs by Abrahamson and De Ridder (2015) noted that institutional ownership correlates with more accurate pricing. Although academic literature centered exclusively on Nordic PE-backed IPOs is limited, the consensus from related European research (Bergström et al., 2006; Levis, 2011) suggests that Nordic PE-backed offerings likely experience underpricing in the same range or lower than

comparable non-sponsored IPOs. It is worth noting that as the PE industry in the Nordics has matured, any early “certification” advantage might diminish if virtually all IPO candidates (PE-backed or not) adhere to high disclosure standards and attract informed investors. Recent Nordic IPO waves (especially on Nasdaq Stockholm and First North) show underpricing levels that do not dramatically differ between sponsor-backed and other IPOs, once size and sector are controlled (Bergström et al., 2006; Levis, 2011).

The level of underpricing in an IPO can be studied from a variety of perspectives. For instance, in the Nordic region, the IPO underpricing has been studied from the value versus growth perspective by Hahl et al. (2014). According to the authors studying Finnish IPOs, growth stocks experience more underpricing than value stocks.

In summary, the short-term performance of PE-backed IPOs in the Nordics tends to reflect moderate underpricing, often slightly less than that of other IPOs, due to lower perceived risk and stronger bargaining power of the sellers. This result is consistent with global evidence that PE-backed IPOs leave less money on the table for first-day investors compared to others (Levis, 2011).

### **3.4 Long-term IPO performance of sponsor-backed companies**

A central question for investors and researchers is how PE-backed IPOs perform in the long run after listing, relative to the market and IPOs without such backing. The general IPO anomaly, as documented by Ritter (1991), is that IPO stocks tend to underperform market indices and peer firms in the 3 to 5-year period after the offering. This long-run underperformance has been attributed to factors such as investor overoptimism, window dressing of firms before IPO, or the reversion of initial mispricing.

The findings by Ritter (1991) are supported in the Nordic context by the study in the Finnish stock market by Keloharju (1993). The author finds evidence of significant long-term underperformance of IPOs in Finland. Keloharju (1993) researched 80 Finnish IPOs

between 1984 and 1989. According to the author, holding the IPO stocks for 36 months would result in a return of only 0,79 euros for every euro invested, when compared to the value-weighted Helsinki Stock Exchange. The author further argues that the underperformance is not tied to any specific industry, but rather a poor general feature of IPOs. The author further notes that the effect is pronounced for smaller firms, implying that the company size may be a critical factor in post-IPO performance. Consistent with the findings by Keloharju (1993), in their study, Hahl et al. (2014) found that IPOs are not performing well during the first three years after the IPO. According to the authors, the average return for the Finnish IPOs after adjusting for market was approximately -30%.

However, private equity-backed companies might be a special case as their PE owners typically focus on improving operations and might time the IPO when the firm is robust, potentially yielding better post-IPO results. On the flip side, critics argue that PE firms could cash out at a peak, leaving the public shareholders with a company that might stagnate or decline after the IPO, especially if the IPO coincides with a “hot” market or if leverage is high (Baker & Wurgler, 2002). Thus, the expected long-run performance of PE-backed IPOs is an empirical matter that prior studies have examined with event-study techniques and comparative analyses.

A growing body of evidence over the past 15 years indicates that PE-backed IPOs often outperform in the long run, or at least avoid the severe underperformance seen in broader IPO samples. Levis (2011) provides a comprehensive analysis of UK IPOs and finds that PE-backed IPOs outperform both venture capital-backed and non-backed IPOs over a three-year horizon. In his study, which covered 1992–2005 IPOs, the buy-out-backed companies earned higher buy-and-hold abnormal returns (BHAR) than others, and this outperformance was robust to different benchmark adjustments. Notably, Levis (2011) reports that the superior performance of PE-backed firms is partly explained by their higher leverage and the discipline it imposes, as well as the ongoing monitoring by retained PE owners. These factors align with agency theory: by keeping management on a tighter leash financially and via governance, PE-backed firms continue to deliver value

post-IPO, whereas many non-sponsored firms suffer from post-IPO drift and strategic inefficiencies.

Consistent evidence comes from the United States. Cao and Lerner (2009) studied reverse leveraged buyouts, firms taken private in leveraged buyouts that later re-listed through an IPO, which is a prominent form of PE-backed IPO in the U.S. They found that these PE-backed IPOs consistently outperform the broader IPO market and stock market indices over three- and five-year periods, with statistically significant positive abnormal returns. In their sample of 594 such IPOs (1980–2002), the average PE-backed IPO beat the market, and this strong performance persisted across different subperiods. Importantly, their analysis showed no evidence of performance deterioration as the PE market matured; even in later years, the outperformance continued. One interesting nuance was that larger PE-backed IPOs and those backed by more experienced PE sponsors achieved better long-run outcomes. This suggests a heterogeneity effect: reputable PE firms and bigger deals (often involving better-quality companies) correlate with superior post-IPO results, perhaps due to more value added during the private phase or greater investor confidence. Conversely, as mentioned earlier, the minority of cases where PE firms fully exit quickly tended to underperform, implying that when no capable sponsor remains to provide oversight, performance can languish.

In the European context, studies also generally find no long-run underperformance and sometimes outperformance for PE-backed IPOs. Bergström et al. (2006) documented that in the long term, PE-backed IPOs outperformed non-sponsored IPOs on average. In the study by Bergström et al. (2006), the European sample showed that even though both groups' returns trended down after the IPO, the PE-backed firms had higher cumulative returns and often stayed above market benchmarks, whereas the non-backed counterparts lagged. Additionally, the authors observed that larger offerings, which were more often PE-backed, had better long-run performance, aligning with the idea that size matters for sustained success.

It is worth noting that not all studies universally find PE-backed IPOs outperforming. There are instances of mixed or contrary evidence, often depending on the sample and context. For example, Viviani, Giorgino, and Steri (2008) examined Italian family-controlled firms going public and found that PE-backed family firm IPOs underperformed both their non-PE-backed counterparts and the market index in subsequent years. This suggests that if the sample is a niche, for instance, a family business, or if the PE involvement is primarily financial without addressing deeper governance issues, the expected benefits may not materialize in the after-market.

A recent study by Matanova et al. (2022) finds that newly public acquirers with PE or VC backing achieve better long-run stock performance than those without such backing. Notably, if a PE-backed IPO undertakes a merger within a year of going public, it performs significantly better than a non-backed acquirer, whereas non-backed acquirers tend to destroy shareholder value in early post-IPO acquisitions. Furthermore, continued ownership by PE funds after the IPO correlates with positive long-run returns for those firms, whereas continued VC backing had a neutral or negative effect beyond the first year. These findings highlight that active, longer-term involvement by PE owners can support value creation even after listing, especially in guiding major strategic moves like acquisitions.

In summary, the evidence indicates that PE-backed IPOs generally match or exceed the long-run performance of market indices and outshine otherwise similar non-PE-backed IPOs. The long-run outperformance is often attributed to the enduring effects of PE stewardship, better governance, solid financial policies, and a focus on value creation, which persist for some time after the IPO. Even when outperformance is not observed, PE-backed firms at least avoid the severe underperformance that affects many IPOs. This resilience is highly relevant in the Nordic context, where investors are interested in whether the surge of PE-sponsored listings in recent years has delivered sustainable returns. The literature suggests cautious optimism: Nordic PE-backed IPOs are not just quick wins on listing day; they can deliver competitive, if not superior, returns in the

years after going public, contingent on the continued alignment of incentives and solid management fostered by their PE sponsors.

## 4 Data and methodology

This section presents the data and the methodology used in the thesis. The hypothesis concerning underpricing in the Nordic region assumes that financial sponsor backing will reduce the level of underpricing during the first trading day of the IPO. For long-term performance, the hypothesis is that IPOs backed by financial sponsors will perform better over time compared to IPOs without private equity involvement.

### 4.1 Data

The data for the thesis is gathered from four Nordic markets. Sweden's financial markets are the most developed and active, translating to high IPO activity; hence, most of the IPOs are from Sweden. In addition, the data includes IPOs from Finland, Norway, and Denmark. The main source of data is LSEG Workspace.

The sample of Nordic IPOs issued between 2013 and 2022 was gathered from the LSEG Workspace database and certain public sources, for instance, the companies' websites and registries for prospectuses. LSEG Workspace was utilized to compile a comprehensive list of IPOs, including their listing dates, offer prices, and post-IPO performance. To analyze IPO underpricing, first-day closing prices were collected. For the long-term analysis, 36-month price data is gathered. The information regarding the ownership structure of the shares of the companies was collected from the listing prospectuses. As the IPO analysis considers a three-year performance period following the IPO, the end year ended up being 2022. Starting in 2013 ensured a sufficient sample size for a robust analysis of the trends and performance of financial sponsor-backed IPOs.

It is worth noting that collecting ownership data for the selected IPO sample involved a significant amount of manual work, as the information had to be individually searched from various sources. Due to the manual nature of the process, there is a risk that some errors may be present in the data. To reduce this uncertainty, the information is cross-

checked using multiple sources to ensure accuracy. However, despite these efforts, it is worth noting that the possibility exists that some errors may remain.

All in all, the data sample consists of 270 IPOs listed on the selected Nordic stock exchanges between 2013 and 2022. The number of IPOs was screened out of the dataset during the study. The most common reasons for exclusion from the data were delisting stocks, lack of prospectuses, involvement in M&A activity, and data errors caused by LSEG Workspace.

Table 1 shows the distribution of IPOs across data sample countries from 2013 to 2022. Over the period, Sweden dominates the Nordic IPO landscape, accounting for 145 of the total 270 IPOs, over half of all listings. The peak year for IPO activity across the region was 2021, with a record 101 IPOs, of which 52 occurred in Sweden. This likely reflects a surge in investor enthusiasm and favorable market conditions in the aftermath of the COVID-19 crisis. Similarly, Norway and Finland experienced noticeable increases in 2020–2021, reaching 21 and 19 IPOs, respectively, in 2021. Denmark, while the smallest IPO market among the four, likewise saw a rise during this period, peaking at 9 IPOs in 2020. Before the 2020–2021 boom, IPO activity was relatively modest across all countries, with Sweden beginning to stand out as early as 2016–2017. However, 2022 saw a decline in IPO activity across the regions, with only 10 IPOs recorded in total. It is worth noting that our sample includes only the first four months of the year, yet this drop likely reflects global market uncertainty, rising interest rates, and cautious investor sentiment.

Overall, the data highlights both Sweden's central role in the Nordic IPO market and the strong cyclicity of IPO volumes in response to broader economic conditions. The distribution of IPOs per year and country is presented in Table 1 below.

**Table 1 Distribution of IPOs per year and country**

Year	Denmark	Finland	Norway	Sweden	Total
2013	1	2	1	1	5
2014	1	1	2	7	11
2015	1	7	4	14	26
2016	1	3	0	13	17
2017	2	3	3	27	35
2018	2	4	1	6	13
2019	2	2	4	7	15
2020	10	1	15	11	37
2021	9	19	21	52	101
2022	0	2	1	7	10
<b>Total</b>	<b>29</b>	<b>44</b>	<b>52</b>	<b>145</b>	<b>270</b>

Table 2 presents the average underpricing of IPOs from 2013 to 2022, along with the number of IPOs each year. Underpricing refers to the percentage gain or loss between the offer price and the first-day closing price. A positive underpricing means the stock price increased on the first day, indicating the IPO was underpriced, while a negative underpricing means the stock price fell, suggesting the IPO was overpriced.

According to the data, the overall average underpricing across all years was 8.26%, indicating that IPOs generally performed well on their initial trading day, which indicates that the underpricing anomaly is present in the Nordic markets. The years 2020 and 2021 stand out as hot markets. These years saw the highest levels of IPO activity, especially in 2021, with 101 IPOs. Additionally, these years exhibited a strong positive underpricing: 17.73% and 13.45%. This combination of high IPO volume and strong first-day returns is a classic indicator of a hot IPO market, where investor demand is high, and companies are confident in going public (Lerner, 1994; Ritter, 1991).

In contrast, earlier years, such as 2013, 2015, and 2016, had negative underpricing, meaning those IPOs were, on average, overpriced, and investors faced first-day losses. These years also had fewer IPOs, which supports the idea that those were cold markets with weaker investor sentiment and less favorable conditions for going public. The shift from negative to positive underpricing in later years reflects improving market confidence and stronger investor demand during the second half of the period. The table below presents the average underpricing per year, along with the number of IPOs each year during the chosen data period of the thesis.

**Table 2 Average underpricing of IPOs per year**

<b>Year</b>	<b>Underpricing</b>	<b>IPOs</b>
2013	-1,40 %	5
2014	3,01 %	11
2015	-3,21 %	26
2016	-4,88 %	17
2017	4,62 %	35
2018	-1,67 %	13
2019	0,76 %	15
2020	17,73 %	37
2021	13,45 %	101
2022	20,44 %	10
<b>Average</b>	<b>8,26 %</b>	<b>270</b>

Table 3 shows the number of IPOs each year from 2013 to 2022, divided between sponsored (backed by a financial sponsor such as a private equity or venture capital firm) and non-sponsored IPOs. Out of the total 270 IPOs in the period, 109 were sponsored, while 161 were non-sponsored, meaning roughly 40% of all IPOs involved a financial sponsor.

The highest activity, which occurred in 2021, with 101 IPOs, 47 sponsored, and 54 non-sponsored reflecting a very evenly distributed year between sponsored and non-

sponsored. This was also the year with the most financial sponsors' involvement. Additionally, the data shows that sponsored IPOs made up a significant share in years such as 2015, where there were more sponsored IPOs than non-sponsored ones, and 2020, where they accounted for roughly 49% of total listings. During the years 2016–2018, non-sponsored IPOs were more dominant; for instance, in 2017, 29 of the 35 IPOs were non-sponsored.

Overall, while non-sponsored IPOs are more common across the full period, the presence of financial sponsors becomes more noticeable during hot markets, particularly 2020 and 2021, when market conditions are favorable, and investors are more willing to accept private equity exits. This may reflect financial sponsors' tendency to time IPOs strategically during high-valuation periods to maximize returns (Baker & Wurgler, 2002; Ritter, 1991). The distribution of non-sponsored and sponsored IPOs is presented in the table below.

**Table 3 IPOs by financial sponsors and non-sponsored**

<b>Year</b>	<b>Sponsored</b>	<b>Non-sponsored</b>	<b>Total</b>
2013	2	3	5
2014	7	4	11
2015	15	11	26
2016	4	13	17
2017	6	29	35
2018	2	11	13
2019	6	9	15
2020	18	19	37
2021	47	54	101
2022	2	8	10
<b>Total</b>	<b>109</b>	<b>161</b>	<b>270</b>

The next table, Table 4, presents the distribution of IPOs in different industries. The most common industry in the sample is the Technology industry. Followed by Industrials, which ranks second in frequency, while Consumer Cyclical constitutes the third most common industry. Overall, as expected, the stocks represent a broad range of different industries.

**Table 4 IPOs per industry**

<b>Industry</b>	<b>Sponsored</b>	<b>Non-sponsored</b>	<b>Total</b>
Academic & Educational Services	2	2	4
Basic Materials	6	6	12
Consumer Cyclical	24	16	40
Consumer Non-Cyclical	4	14	18
Energy	0	3	3
Financials	5	12	17
Government Activity	0	1	1
Healthcare	14	25	39
Industrials	28	28	56
Real Estate	1	7	8
Technology	24	45	69
Utilities	1	2	3
<b>Total</b>	<b>109</b>	<b>161</b>	<b>270</b>

## **4.2 Methodology**

In the study of IPO performance, researchers commonly distinguish between short-term and long-term returns, employing specific methodologies to capture each dimension. Two of the most frequently used approaches in academic literature are the first-day raw return for measuring underpricing and the Buy-and-Hold Abnormal Return (BHAR) for assessing post-listing performance.

Short-term performance is typically assessed through the calculation of first-day returns, which reflect the percentage difference between the offer price and the closing price on the first trading day. This measure is widely used to capture the level of underpricing, a phenomenon well documented in early studies such as Ritter (1984) and Loughran and Ritter (1995). These studies found that IPOs generally experience significant positive returns on their first day, indicating systematic underpricing.

This approach has been applied in several comparative studies of sponsor-backed and non-sponsored IPOs. For instance, Megginson and Weiss (1991) used first-day returns to examine the role of venture capital in signaling firm quality, while Bergström, Nilsson, and Wahlberg (2006) investigated whether private equity backing influences underpricing in European IPO markets. Such studies typically use statistical tests, including t-tests and non-parametric tests, to compare average underpricing levels across different IPO groups.

For long-term performance, many studies use the Buy-and-Hold Abnormal Return (BHAR) methodology. BHAR estimates the compounded return earned by holding an IPO stock over a specified period (e.g., 36 months), adjusted by subtracting the return of a benchmark index over the same time frame. This method has become standard in long-run IPO research because it reflects the investor's experience over time.

The BHAR method was first employed in IPO studies by Ritter (1991), who documented the long-run underperformance of IPOs in the U.S. market. More recent studies have applied the same methodology to examine differences in post-IPO performance across ownership structures. For instance, Levis (2011) used BHAR to compare PE-backed, VC-backed, and non-sponsored IPOs in the UK, finding that PE-backed firms exhibited superior long-term returns. Similarly, Cao and Lerner (2009) applied BHAR to a large sample of U.S. reverse leveraged buyouts and observed consistent outperformance relative to market benchmarks.

#### 4.2.1 Underpricing methodology

To measure the short-term performance of IPOs, this study calculates the first-day return, which captures the level of underpricing. Underpricing is defined as the percentage change between the offer price set during the IPO process and the closing price at the end of the first day of trading. This metric reflects how much the market valuation of the company increases once public trading begins. The first-day return is calculated using the following formula:

$$UP (\%) = \left( \frac{\text{first-day closing price} - \text{initial offer price}}{\text{initial offer price}} \right) \times 100\% \quad (4)$$

In this underpricing formula, the initial offer price is subtracted from the first-day closing price, divided by the offer price, and the result is multiplied by 100 to express it as a percentage.

#### 4.2.2 Post-IPO and 36-month performance methodology

To evaluate long-term performance, this study applies the Buy-and-Hold Abnormal Return (BHAR) methodology, which measures how much an IPO outperforms or underperforms a market benchmark over a defined holding period. The BHAR method was used to calculate the long-term performance of IPOs by Ritter and Welch (2002) and by Levis (2011), and more recently by Matanova et al. (2022). The BHAR reflects the total return earned by an investor who purchases shares at the offer price and holds them for 36 months. The BHAR for each IPO is calculated with the following formula:

$$BHAR_i = \prod_{t=1}^T \{(1 + r_t^i) - \prod_{t=1}^T (1 + r_t^m)\} \quad (5)$$

Where  $T = 36$  (months),  $r_t^i$  is the monthly raw return of each stock, and  $r_t^m$  is the monthly return of the market index. A positive BHAR suggests the IPO outperformed the

benchmark, while a negative BHAR indicates underperformance. The MSCI Nordic Countries Index is used as the benchmark, as it contains all the Nordic countries.

### 4.3 Regression

To examine the relationship between ownership structure and IPO performance, this study employs two cross-sectional regression models: one for short-term performance and another for long-term performance. The dependent variable in the first model is the first-day return, which captures the level of underpricing. In the second model, the dependent variable is the Buy-and-Hold Abnormal Return (BHAR) over 36 months following the IPO, which reflects the long-term performance relative to a market benchmark.

The main explanatory variable in both models is a binary PE/VC dummy, which equals 1 if the IPO was backed by private equity or venture capital investors at the time of listing, and 0 otherwise. This approach follows the earlier literature by Levis (2011) and Bergström et al. (2006). This variable allows us to isolate the potential effect of financial sponsor backing on IPO returns while holding other factors constant.

In addition to the ownership structure, the models incorporate two sets of control variables. First, IPO market conditions are controlled by including a dummy variable for hot markets following prior literature by Ritter (1991), Levis (2011), and Bergström et al. (2006). A hot market is defined as a year in which the average first-day return of all IPOs exceeds the overall average return across the full sample period. If the IPO occurred in a hot year, the Hot Market dummy takes the value 1; otherwise, it is set to 0. Cold markets serve as the baseline category and are not separately included to avoid perfect multicollinearity. This control accounts for fluctuations in investor sentiment and market momentum, which are known to influence IPO pricing and performance.

Second, firm-level characteristics are included to capture the effects of financial structure and size. Firm size is measured as the natural logarithm of total assets, following the

approach by Levis (2011) and Bergström et al. (2006). Then, leverage is introduced, where leverage is calculated as total debt divided by total assets. It is worth noting that leverage as a control variable is not commonly used in studies. Some studies, such as Su (2004), find that in China, a market considered less mature, the degree of leverage leads to higher underpricing. Therefore, this study includes capital structure as a variable to capture its impact on IPO performance.

These variables are combined in an ordinary least squares (OLS) regression framework. By controlling for market timing, firm size, and capital structure, the models are designed to isolate the effect of PE/VC backing on IPO performance and provide more reliable estimates. The same specification is applied to both the short-term and long-term models, with the only difference being the dependent variable used.

$$UP_i = \alpha + \beta_1 \cdot Sponsored_i + \beta_2 \cdot HotMarket_i + \beta_3 \cdot Size_i + \beta_4 \cdot Leverage_i + \varepsilon_i$$

(6)

$$BHAR_i = \alpha + \beta_1 \cdot Sponsored_i + \beta_2 \cdot HotMarket_i + \beta_3 \cdot Size_i + \beta_4 \cdot Leverage_i + \varepsilon_i$$

(7)

## 5 Results

The previous chapter introduced the data and methodology of the thesis. This chapter presents the results obtained through the application of these methodologies and data. The results chapter is divided into two sections: the first presents the findings related to underpricing, while the second presents the findings on long-term performance.

### 5.1 Results on Underpricing

Table 5 presents the regression results regarding the underpricing of initial public offerings. In the baseline model (1), the only explanatory variable is the dummy variable indicating whether the IPO was backed by a financial sponsor. The coefficient is -3.4%, suggesting that sponsored IPO's may be slightly less underpriced than non-sponsored, but this effect is not statistically significant, and the R-squared is near zero, which indicates minimal explanatory power. The results from model 1 indicate that sponsorship alone does not explain IPO underpricing.

In the second model (2), a hot market dummy variable is introduced. The sponsored coefficient becomes slightly more negative at -5.4% yet remains statistically insignificant. Furthermore, the hot market variable shows a strong and statistically significant effect on underpricing, with a coefficient of 13.7% significant at the 1% level. This result supports the findings of previous literature (Bergström et al., 2006; Ritter, 1991; Ibbotson & Jaffe, 1975). In terms of sponsorship, no real effect is found in the second model.

In the third model, firm size is added as a variable, proxied through the natural logarithm of total assets. The sponsored coefficient is -6.6% and becomes marginally significant at the 10% level, which provides some weak evidence that sponsored IPOs are less underpriced than non-sponsored ones, after controlling for market timing and firm size. In conclusion, after controlling for sponsorship, market temperature, and firm size variables, the only significant underpricing driver is market timing, according to the results.

Model 4 introduces the leverage ratio as a proxy for capital structure. Results show that leverage is negatively and significantly associated with underpricing at the 1% level, suggesting that firms with more leverage experience lower underpricing. When the leverage variable is added to model 4, the sponsorship stays negative at -7.4% and remains marginally significant at the 10% level. This provides some tentative support for H1.

To summarize the results of underpricing, the simplest models 1 and 2, the sponsored variable is consistently negative, but statistically insignificant, offering no evidence for H1. In models 3 and 4, after controlling for firm size and leverage, the sponsored coefficient becomes marginally significant at the 10% level, partially supporting H1. Throughout all models, the market timing remains consistently a significant predictor of underpricing, supporting the findings by Bergström et al. (2006), Ibbotson & Jaffe (1975), and Ritter (1991). The results on the effect of financial sponsors on underpricing differ somewhat from earlier studies like Mogilevsky and Murgulov (2012), Megginson and Weiss (1991), and Bergström et al. (2006), which found stronger evidence that sponsor-backed IPOs are less underpriced. A possible reason for this difference is that this study did not separate VC and PE sponsors, which might affect the results.

**Table 5 Multivariate regression model on Underpricing**

Variable	(1) UP	(2) UP	(3) UP	(4) UP
Intercept	0.096 *** (3.41)	0.034 (1.00)	-0.224 (-1.34)	-0.175 (-1.05)
Sponsored	-0.034 (-0.77)	-0.054 (-1.22)	-0.066 * (-1.48)	-0.074 * (-1.67)
Hot Market		0.137 *** (3.17)	0.150 *** (3.42)	0.151 *** (3.49)
Log(Assets)			0.015 (1.57)	0.018 * (1.91)
Leverage Ratio				-0.154 *** (-2.95)
Equity Ratio				
R <sup>2</sup>	0.002	0.038	0.047	0.077
Adj. R <sup>2</sup>	-0.002	0.031	0.036	0.063
N	270	270	270	270

The sample comprises 270 IPOs listed in Finland, Sweden, Norway, and Denmark. The sample period is from 2013 until the end of April 2022. Non-backed IPOs represent the majority of the sample. In more detail, the sample consists of 109 sponsor-backed IPOs and 161 non-sponsor-backed IPOs. The dependent variable in this regression is initial underpricing, calculated as the first-day return. Asterisks indicate the statistical significance levels. \* Refers to statistical significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level. T-statistics are in parentheses. The multivariate regression was conducted using EVIEWS.

## 5.2 Results on Long-term Performance

Table 6 presents the regression results for the 36-month BHAR of IPOs. Following the methodology and variables in the short-term performance, in the baseline model (1), the only explanatory variable is a dummy variable indicating whether the IPO was backed by a financial sponsor or not. The coefficient is negative at -28.8% and statistically significant at the 10% level. This result would suggest that, contrary to our H2, sponsored IPOs underperform compared to non-sponsored IPOs. The R-squared is relatively low at 1.2%, but the statistical significance of the sponsorship variable would imply that sponsorship might play a role in post-IPO performance, though in the opposite direction that our H2 suggests.

In model 2, the hot market dummy is added to the formula to control for market timing, as was done in the short term. Sponsorship coefficient becomes smaller and statistically insignificant at -16.2%. On the other hand, as was discovered in the short-term testing, the hot market variable enters with a strong negative and highly significant coefficient of 88.1%, which indicates that IPOs issued during a hot market period perform significantly worse over the long term, compared to issues in cold markets.

In model 3, firm size is added, proxied through the natural logarithm of total assets. The sponsorship coefficient remains negative at -15.4% and statistically insignificant. The hot market effect remains strong and significant, and firm size has no explanatory power in predicting long-term returns. Once again, the model fails to support H2 but highlights market timing as a determinant of long-run IPO performance.

Then, in model 4 leverage ratio is added to proxy for capital structure. Sponsored variables coefficient remains negative at -17% and statistically insignificant. The leverage variable is negative at -32.6% and statistically significant at the 10% level, which would indicate that companies with higher debt levels tend to perform worse post-IPO. The hot market variable continues to exert a significant negative effect, as before.

To summarize the results, Model 1 provides weak evidence against H2, suggesting sponsored IPOs would underperform their peers and the index. In all the extended models 2-4, the sponsorship coefficient remains negative but is statistically insignificant. This means there is no consistent support for H2 across all models. The only consistent factor seems to be, once again, market timing, where IPOs launched in hot market conditions exhibit significantly worse long-term returns, supporting the findings of Bergström et al. (2006) and Ritter (1991). The findings on the effect of financial sponsors on long-term returns contrast with earlier studies such as Levis (2011) and Cao and Lerner (2009), which reported better long-term performance for PE-backed IPOs. One possible reason for the difference is that this study's Nordic sample includes a mix of sponsor types and smaller firms.

**Table 6 Multivariate regression model on BHAR-36**

Variable	(1) BHAR36	(2) BHAR36	(3) BHAR36	(4) BHAR36
Intercept	0.0007 (0.01)	0.400 *** (3.40)	0.555 (0.95)	0.659 (1.13)
Sponsored	-0.288 * (-1.79)	-0.162 (-1.06)	-0.154 (-0.99)	-0.170 (-1.10)
Hot Market		-0.881 *** (-5.88)	-0.890 *** (-5.82)	-0.887 *** (-5.83)
Log(Assets)			-0.009 (-0.27)	-0.003 (-0.08)
Leverage Ratio				-0.326 * (-1.77)
Equity Ratio				
R <sup>2</sup>	0.012	0.125	0.125	0.136
Adj. R <sup>2</sup>	0.008	0.119	0.116	0.123
N	270	270	270	270

The sample comprises 270 IPOs listed in Finland, Sweden, Norway, and Denmark. The sample period is from 2013 until the end of April 2022. Non-backed IPOs represent the majority of the sample. In more detail, the sample consists of 109 sponsor-backed IPOs and 161 non-sponsor-backed IPOs. The dependent variable is the BHAR of 36 months, where the benchmark used is the MSCI Nordic Countries Index. \* Refers to statistical significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level. T-statistics are in parentheses. The multivariate regression was conducted using EViews.

## 6 Conclusions

This thesis investigated the impact of financial sponsor ownership on IPO underperformance and 36-month return in the four Nordic countries. The thesis examined the Nordic IPOs with a sample of 270 IPOs issued between 2013 and 2022 in Finland, Norway, Denmark, and Sweden.

Studying the short-term underpricing, this study used a regression analysis, and the underpricing was measured as the first-day return of the stock. The results provided limited and model-dependent support for H1, which posited that sponsored IPOs are less underpriced than non-sponsored ones. While the coefficient was negative consistently across all five of our models, it was only marginally significant at the 10% level in models that included firm size and leverage as control variables. On the contrary, the hot market dummy emerged as a strong and statistically significant predictor of first-day underpricing across all five models, meaning IPOs issued during hot market periods experienced notably higher first-day returns. This finding is consistent with earlier studies by Bergström et al. (2006), Ibbotson and Jaffer (1975), and Ritter (1991).

The long-term regression models studied whether sponsored IPOs outperform non-sponsored IPOs net of benchmark index returns. Contrary to the expectations set by H2, the results showed no consistent evidence that sponsored IPOs deliver higher BHARs compared to non-sponsored ones. In the baseline model, sponsorship was negatively associated with BHAR and statistically significant at the 10% level; however, when market timing, firm size, and leverage controls were added, the effect became statistically insignificant. The hot market variable, on the other hand, maintained a strong negative and statistically significant relationship with long-term returns across all models. Hot market variable maintaining its significance aligns with prior research from Ritter (1991) and Bergström et al. (2006), indicating that IPOs issued in hot market periods tend to underperform in the long term due to initial overvaluations.

While the thesis offers new insight into how sponsor-backed IPOs perform in the Nordics, several limitations must be acknowledged. The dataset is limited to publicly available IPOs between 2013 and 2022 and excludes delisted firms and firms that did not have any data in our data provider, LSEG Workspace. In addition, the binary classification of sponsorship does not capture differences between venture capital and private equity or account for intensity in their involvement. Lastly, the buy-and-hold abnormal return (BHAR) is used as the sole measure of long-term performance, which may be sensitive to benchmark selection and does not adjust for risk factors such as size or firm value.

These findings have practical relevance for both investors and companies planning to go public. For investors the relevance lies in the fact that sponsor-backed IPOs might lead to more accurate listing prices, although the correlation was marginally significant on only two out of five models. And based on the results of this study, being sponsor-backed was consistently associated with inferior long-term returns compared to non-sponsored IPOs, although this result was also marginally significant only on one model. This suggests that financial backing should not be relied upon as the sole sign for correct listing prices or long-term value. For companies planning to go public, our results would suggest planning to IPO when the volume of issuance is high. Academically, the study contributes to the Nordic IPO literature by highlighting a consistent, yet statistically weak pattern of reduced underpricing and long-term underperformance among sponsor-backed IPOs.

Future studies could complement the BHAR methodology with a calendar-time portfolio approach to address potential cross-sectional dependencies, as suggested by Matanova et al. (2022). It would also be valuable to differentiate between types of financial sponsors, such as venture capital, growth equity, and buyout funds, to assess whether performance varies by sponsor type and not studying them as a whole, since the investment and exit strategies of them are quite different in style. Studying specific sectors and expanding the dataset to include a longer time period or additional European IPO markets beyond the Nordics would also provide even further insight.

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## Appendices

### Appendix 1. Dataset of 270 Nordic IPOs made in 2013-2022

Year	First trade date	Sponsored
Promimic AB	29.4.2022	1
Katalysen Ventures AB	20.4.2022	1
Lapwall Oy	8.4.2022	0
Oneflow AB	8.4.2022	0
Evli Pankki Oyj	4.4.2022	0
Combinedx AB	28.3.2022	0
Swedish Logistic Property AB	23.3.2022	0
Lyckegard Group AB	21.2.2022	0
Var Energi AS	16.2.2022	0
Newbury Pharmaceuticals AB	4.2.2022	0
W5 Solutions AB	17.12.2021	0
Administer Oy	17.12.2021	1
Case Group AB	16.12.2021	0
Kempower Oy	14.12.2021	0
Viva Wine Group AB	14.12.2021	0
Titania Holding AB	10.12.2021	0
Devyser Diagnostics AB	10.12.2021	0
Aiforia Technologies Oy	10.12.2021	1
Betolar Plc	9.12.2021	1
Norva24 Group AB	9.12.2021	1
Lamor Corporation Plc	8.12.2021	1
Adtraction Group AB	7.12.2021	0
Kvix AB (Publ)	6.12.2021	0
Nivika Fastigheter AB (Publ)	3.12.2021	0
Digital Workforce Services Oy	3.12.2021	1
Klarabo Sverige AB	2.12.2021	1
Norrhydro Group Oy	1.12.2021	0
Edda Wind AS	26.11.2021	0

New Bubbleroom Sweden AB	23.11.2021	0
SHT Smart High-Tech AB	18.11.2021	0
Candles Scandinavia AB	8.11.2021	1
Qlucore AB	5.11.2021	0
Autostore Holdings Ltd	20.10.2021	1
Netel Holding AB	15.10.2021	1
Nordisk Bergteknik AB	12.10.2021	1
Inderes Oy	11.10.2021	0
Truecaller AB	8.10.2021	1
Storskogen Group AB	6.10.2021	0
Genetic Analysis AS	1.10.2021	0
eEducation Albert AB	1.10.2021	1
Modulight Corporation	30.9.2021	0
EcoUp Oyj	29.9.2021	0
Soder Sportfiske AB	9.9.2021	1
Biofish Holding AS	3.8.2021	0
Modus Therapeutics Holding AB	22.7.2021	1
Pila Pharma AB	15.7.2021	1
Gigante Salmon AS	5.7.2021	0
First Venture Sweden Private AB	2.7.2021	1
Profoto Holding AB	1.7.2021	0
Aquaporin A/S	28.6.2021	0
SmartCraft ASA	24.6.2021	1
Spinnova Oyj	24.6.2021	1
Puulo Oyj	24.6.2021	1
USWE Sports AB	24.6.2021	0
Intellego Technologies AB	24.6.2021	0
Biosergen AB	24.6.2021	1
Brilliant Future AB	23.6.2021	1
Komplett AS	21.6.2021	0
Solwers Oyj	18.6.2021	0
Hexicon AB	18.6.2021	1
CodeMill AB	18.6.2021	1

Masoval AS	17.6.2021	0
Elopak ASA	17.6.2021	1
Acast AB	17.6.2021	1
Green Hydrogen Systems A/S	17.6.2021	1
RVRC Holding AB	16.6.2021	1
AROS Bostadsutveckling AB	16.6.2021	1
Lytix Biopharma As	14.6.2021	0
Toivo Group Oyj	11.6.2021	0
Maven Wireless Sweden AB	10.6.2021	1
Sleep Cycle AB	8.6.2021	1
MilDef Group AB	4.6.2021	0
Smartoptics Group AS	3.6.2021	0
Mapspeople A/S	2.6.2021	0
Linc AB	28.5.2021	0
Arla Plast AB	25.5.2021	0
Cedergrenska AB	25.5.2021	0
DonkeyRepublic Holding A/S	25.5.2021	1
Checkin.com Group AB	20.5.2021	1
Norsk Titanium AS	18.5.2021	0
Safello Group AB	12.5.2021	1
Alexandria Pankkiiriliike Oyj	12.5.2021	0
Tellusgruppen AB	28.4.2021	0
Modelon AB	28.4.2021	0
Hemnet Group AB	27.4.2021	1
TROPHY GAMES Development A/S	27.4.2021	0
Impero A/S	22.4.2021	0
Tekna Holding AS	30.3.2021	0
LMK Group AB	29.3.2021	1
Pierce Group AB	26.3.2021	1
Idun Industrier AB	25.3.2021	0
Orthex Oyj	25.3.2021	1
Sitowise Group Oyj	25.3.2021	1
Embellence Group AB	24.3.2021	0

RISMA Systems A/S	23.3.2021	0
Nightingale Health Oyj	19.3.2021	0
RugVista Group AB	18.3.2021	1
HAV Group ASA	4.3.2021	0
Rana Gruber AS	26.2.2021	0
Desenio Group AB	25.2.2021	1
Arctic Bioscience AS	24.2.2021	1
Kreate Group Oy	19.2.2021	1
Cint Group AB	19.2.2021	1
Arctic Fish Holding AS	19.2.2021	0
Lumi Gruppen AS	17.2.2021	1
Fractal Gaming Group AB	11.2.2021	1
Nimbus Group AB	9.2.2021	1
Cambi ASA	9.2.2021	0
BactiQuant A/S	5.2.2021	0
Proximar Seafood AS	3.2.2021	0
Nexcom A/S	29.1.2021	0
Cyviz AS	18.12.2020	1
Elektroimportoren AS	16.12.2020	1
DecideAct A/S	16.12.2020	1
Hexagon Purus AS	14.12.2020	0
Fasadgruppen Group AB	9.12.2020	1
CirChem AB	9.12.2020	1
Thunderful Group AB	7.12.2020	0
Cadeler A/S	27.11.2020	0
Nordnet AB	25.11.2020	1
Fortinova Fastigheter AB	19.11.2020	0
Luxbright AB	19.11.2020	1
HusCompagniet A/S	18.11.2020	0
Dataproses Group A/S	13.11.2020	0
Alefarm Brewing A/S	6.11.2020	0
Airthings AS	30.10.2020	1
WindowMaster International A/S	27.10.2020	0

Ocean Sun AS	26.10.2020	0
LINK Mobility Group ASA	21.10.2020	0
LINK Mobility Group Holding ASA	21.10.2020	1
Norcod AS	15.10.2020	1
HydrogenPro AS	14.10.2020	0
Wastbygg Gruppen AB	13.10.2020	1
Zaptec AS	6.10.2020	0
LifeClean International AB	1.10.2020	0
Salmon Evolution Holding AS	18.9.2020	1
Audientes A/S	18.9.2020	0
Readly International AB	17.9.2020	1
Exsitec Holding AB	16.9.2020	1
Spotlight Group AB	15.9.2020	1
BEWi ASA	28.8.2020	1
Aker Biomarine AS	6.7.2020	1
Fom Technologies A/S	26.6.2020	0
Shape Robotics ApS	25.6.2020	0
LED iBond International A/S	15.6.2020	0
Kaldvik As	5.6.2020	0
Nanoform Finland Oyj	4.6.2020	0
Pexip Holding AS	14.5.2020	1
Kollect On Demand Holding AB	19.12.2019	0
Optomed Oyj	5.12.2019	1
SATS ASA	23.10.2019	0
Norske Skog ASA	18.10.2019	0
Relais Group Oy	17.10.2019	0
EQT AB	24.9.2019	1
Norbit ASA	20.6.2019	0
Mentice AB	18.6.2019	1
OKEA ASA	18.6.2019	0
John Mattson Fastighetsforetagen AB	5.6.2019	0
Danish Aerospace Company A/S	27.5.2019	0
Konsolidator A/S	10.5.2019	0

Karnov Group AB	11.4.2019	1
Ferroamp Elektronik AB	22.3.2019	1
Ascelia Pharma AB	13.3.2019	1
Lime Technologies AB	6.12.2018	1
Oma Saastopankki Oy	30.11.2018	0
ViroGates A/S	26.6.2018	0
Projektengagemang Sweden AB	19.6.2018	0
Kojamo Oyj	15.6.2018	0
Netcompany Group As	7.6.2018	1
Ovzon AB	18.5.2018	0
Enersense International Oy	24.4.2018	0
Iconovo AB	6.4.2018	0
Green Landscaping Holding AB	23.3.2018	0
Elkem ASA	22.3.2018	0
Admicom Oyj	9.2.2018	0
InfraCom Group AB	15.1.2018	0
Hitech & Development Wireless Sweden	22.12.2017	1
Lyko Group AB	12.12.2017	0
Acconeer AB	11.12.2017	0
Mag Interactive AB	8.12.2017	0
DevPort AB	7.12.2017	0
Tempest Security AB	6.12.2017	0
TCM Group A/S	24.11.2017	1
2cureX AB	24.11.2017	0
Touchtech AB	22.11.2017	1
Gofore Oyj	16.11.2017	0
Crayon Group Holding ASA	8.11.2017	0
Bibbinstruments AB	27.10.2017	0
WeAreQiiwi Interactive AB	13.10.2017	0
BioArctic AB	12.10.2017	0
Balco Group AB	6.10.2017	0
Sparebank 1 Nordvest	2.10.2017	0
Inhalation Sciences Sweden AB	28.9.2017	1

SenzaGen AB	21.9.2017	0
Seamless Distribution Systems AB	21.7.2017	0
Bonesupport Holding AB	21.6.2017	0
Green Mobility A/S	16.6.2017	0
SpareBank 1 Ostlandet	13.6.2017	0
Boozt AB	31.5.2017	1
TerraNet Holding AB	30.5.2017	0
Medicover AB	23.5.2017	0
Munters Group AB	19.5.2017	0
Integrum AB	15.5.2017	0
Kamux Oyj	12.5.2017	1
Bambuser AB	5.5.2017	0
Fondia Oy	4.4.2017	0
Isofol Medical AB	4.4.2017	0
Ambea AB	31.3.2017	0
Biovica International AB	29.3.2017	0
MIPS AB	23.3.2017	0
Oncopeptides AB	22.2.2017	0
SeaTwirl AB	22.12.2016	0
Acarix AB	19.12.2016	0
Smart Eye AB	7.12.2016	0
Bygg Partner i Dalarna Holding AB	5.12.2016	1
THQ Nordic AB	22.11.2016	0
Heeros Oyj	10.11.2016	0
GomSpace Group AB	16.6.2016	0
AcadeMedia AB	15.6.2016	0
TF Bank AB	14.6.2016	0
B3IT Management AB	13.6.2016	0
Paradox Interactive AB	31.5.2016	0
Tokmanni Group Oyj	29.4.2016	1
Resurs Holding AB	29.4.2016	1
Lehto Group Oyj	28.4.2016	0
Nepa AB	26.4.2016	0

Humana AB	22.3.2016	1
Scandinavian Tobacco Group A/S	10.2.2016	0
Consti Yhtiot Oy	11.12.2015	1
Nilsson Special Vehicles AB	11.12.2015	0
Camurus AB	3.12.2015	0
Scandic Hotels Group AB	2.12.2015	1
Attendo AB	30.11.2015	1
Dometic Group AB	25.11.2015	1
Kid ASA	2.11.2015	0
Bravida Holding AB	16.10.2015	1
Europris ASA	19.6.2015	1
Padox AB	18.6.2015	0
Alimak Group AB	17.6.2015	1
Coor Service Management Holding AB	16.6.2015	1
Vistin Pharma ASA	10.6.2015	0
Pihlajalinna Oy	4.6.2015	1
SciBase Holding AB	2.6.2015	1
Multiconsult AS	22.5.2015	0
Robit Oyj	21.5.2015	0
Savo-Solar Oy	27.4.2015	0
Tobii AB	24.4.2015	1
Enento Group Oyj	27.3.2015	1
Troax Group AB	27.3.2015	1
Hoist Finance AB	25.3.2015	1
Detection Technology Oy	16.3.2015	0
Piippo Oyj	10.3.2015	0
NNIT A/S	6.3.2015	0
Eltel AB	6.2.2015	1
NP3 Fastigheter AB	4.12.2014	0
Thule Group AB	26.11.2014	1
Entra ASA	17.10.2014	0
Absolent Group AB	16.10.2014	0
Granges AB	10.10.2014	1

Inwido AB	26.9.2014	1
Zalaris ASA	20.6.2014	1
Bactiguard Holding AB	19.6.2014	0
Herantis Pharma Oyj	11.6.2014	1
ISS A/S	13.3.2014	1
Bufab AB	21.2.2014	1
Platzer Fastigheter AB	29.11.2013	1
Restamax Oyj	28.11.2013	1
Orava Asuinkiinteistorahasto Oyj	14.10.2013	0
Odfjell Drilling AS	27.9.2013	0
Matas A/S.	28.6.2013	0