

Unveiling Value Dynamics: A Comparative Analysis of Underpricing and Long-Term Performance Among PE-Backed, VC-Backed, and Non-Backed IPOs in the Swedish Market

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Abstract

This research investigates initial underpricing and subsequent long-term aftermarket performance of private equity-backed, venture capital-backed and non-backed initial public offerings (IPOs) in the Swedish market. With a sample of 401 IPOs from January 2011 to December 2021 on the Nasdaq Stockholm and Nordic Growth Market, the study delves into the distinctive firm and IPO characteristics of the three categories. The findings indicate that PE-backed companies exhibit less underpricing than venture capital-backed and non-backed firms. PE-backed companies also demonstrate more robust long-term performance than the other two groups in 36-months BHAR, both on an equal and value-weighted basis. We also observe that PE-backed firms show significant and robust outperformance, looking at yearly cohorts compared to their counterparts. Finally, controlling for different operational and financial characteristics, we find that PE-backed firms have a significant long-term outperformance. The results shed light on the unique impact of VC and PE backing on IPO performance in the Swedish market, offering valuable insights for understanding underpricing and aftermarket dynamics.

Key words:

Initial Public Offering, Private Equity, Venture Capital, Underpricing, Long-term performance

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1.0 Introduction

The landscape of initial public offerings (IPOs) presents a fascinating arena for financial research, particularly in the context of underpricing and long-term aftermarket performance. This thesis focuses on the Swedish market, a dynamic environment that has seen various companies go public on platforms like Nasdaq Stockholm and the Nordic Growth Market. The period spanning from January 2011 to December 2021 forms the timeframe for our study, providing us with 11 years of data to examine and comprehend.

This study examines IPOs across three distinct categories: private equity-backed, venture capital-backed, and non-backed companies. We aim to analyze how each group's unique characteristics influence their initial market performance and growth over time, specifically over 12, 24, and 36 months. We aim to delve into the specific factors affecting their initial pricing and long-term success in the market.

The evolving dynamics of the IPO market in Sweden underscore the relevance of this study. In recent years, the market has witnessed a surge in private equity (PE) and venture capital (VC) activities, making it of interest to understand how these forms of backing impact the performance of IPOs. Traditional views on IPO underpricing and performance might not fully capture the nuances of the modern market, particularly in a setting as unique as Sweden's. This necessitates a fresh examination of the factors at play.

Our analysis is based on a total of 401 companies. We carefully sorted these companies according to their type of financial backing, which is key to ensuring our study is accurate and relevant. This thesis utilizes Ordinary Least Squares (OLS) regressions and t-tests to investigate IPO underpricing and aftermarket performance complexities.

Our findings reveal that underpricing is most pronounced in the Health Care, Financials, and Materials sectors, while it is less common in the Energy, Utilities, and Real Estate sectors. Notably, there are significant yearly fluctuations in initial pricing, with a recent trend showing a decrease in underpricing. PE-backed companies tend to experience the least underpricing, while venture capital VC-backed companies exhibit the highest degree of underpricing.

Regarding long-term performance, PE-backed firms demonstrate significant outperformance compared to the other groups at 24 months and 36 months post-IPO, both on an equal and value-weighted basis. Non-backed firms show slightly stronger 12-month returns, but in later periods, exhibit significant negative returns. Furthermore, our analysis finds no statistical evidence supporting the notion that VC-backed firms outperform the benchmarks over any of the 12, 24, or 36-month periods. Furthermore, investigating the 36-BHAR per cohort based on IPO year, we find that PE-backed firms exhibit sustained overperformance compared to the benchmark in all years except 2020. In contrast, VC-backed and NB firms show fluctuations in BHAR over the years, with noticeable poor performance from 2018 to 2020.

Our multivariate regression analysis for long-term performance reinforces PE-backed firms' superior performance over non-backed and VC-backed firms for 24-months. However, over 36-months, PE-backed firms have shown slightly worse performance than the wealth-relative benchmark. Additionally, in contrast to previous research, we identify a positive correlation between firm size and long-term returns. This unexpected correlation prompts further exploration into the nuanced factors influencing the long-term performance dynamics in the IPO market.

The results of this study are not just academic but have practical implications for investors, financial analysts, and policymakers. By exploring how different types of financial backing influence post-IPO performance in the Swedish market, our research contributes to a more detailed understanding of the dynamics between financial sponsors and aftermarket performance. The following chapters will discuss our findings' methodology, analysis, and implications, aiming to shed light on a topic of growing importance in finance.

2.0 Literature review

Our literature review is structured around two principal themes to understand the implications of private equity ownership on the performance of companies post-IPO. First, we delve into the realm of private equity in the context of IPO exits, shedding light on the roles of PE investors and their selection of exit avenues. Second, we cover the dynamics between sponsor backing and the subsequent performance of the companies post-IPO, particularly the phenomenon of underpricing and long-term returns through empirical research.

2.1 Private equity and IPO exit

2.1.1 Role of PE investors

Kaplan and Strömberg (2009) categorize the alterations private equity firms might implement in target companies into three foundational pillars: financial engineering, governance engineering, and operational engineering.

In investigating financial engineering, several scholars emphasize its pivotal role in generating returns for buyout firms. Guo et al. (2011) posit that heightened debt levels can amplify tax shields, and they also underscore how PE investors can distribute value from shareholders via dividend recaps. This notion of leveraging introduces discipline among managers, which reduces the "Free Cash Flow Problem". Jensen (1986) elaborated on this, suggesting that companies, especially those in mature industries with inadequate governance, might squander cash flow rather than redistribute it to shareholders.

However, the role of private equity in operational performance has attracted a variety of perspectives. On the one hand, a shift in focus is discernible in recent scholarly discourse, emphasizing the merits of operational improvements. Private equity firms are bolstering their operational capabilities to support their portfolio entities. Kaplan and Strömberg (2009) argue against solely relying on financial engineering for value creation. Acharya et al. (2009) observed that portfolio companies that experience extensive operational engagement from their PE benefactors tend to outshine their rivals. Jensen (1989) further supports this by claiming that PE investors fortify portfolio company value through operational efficiencies, as reflected in organizational restructuring and incentives for productivity.

On the other hand, opposing views challenge the optimistic stance on PE's role in operational performance. Appelbaum and Batt (2013) researched the ramifications of private equity's management of firms. They point to challenges that can impair the long-term health of a company, cautioning against an overemphasis on short-term gains at the expense of sustainable growth. This view is further supported by Cressy et al. (2007), who hint at potential negative consequences of private equity practices on the operational front, underscoring the nuanced effects of private equity ownership.

A study by Davis et al. (2014) offers a balanced perspective, acknowledging the operational efficiencies that private equity buyouts can introduce. Nevertheless, they highlight the potential limitation of certain aspects like R&D investments. This potential drawback is significant given that innovation is often a cornerstone for long-term growth and competitiveness in various industries. Furthermore, Strömberg (2008) delves into the evolving nature of private equity, hinting at the implications of certain modern PE practices on innovation. A relevant point raised is that although operational efficiencies might be achieved in the short term, the overarching impact on a firm's innovative capacity and long-term performance might be adversely impacted.

Zahra (1996) provides another layer to this conversation, discussing how different governance structures, including those seen in private equity-owned firms, can influence a company's entrepreneurial activities. His work suggests that these structures only sometimes foster an environment conducive to long-term operational growth, especially in industries disposed with technological opportunities. While there is a consensus on private equity's capacity to improve operational efficiencies, the broader picture is more multifaceted. The long-term operational performance of PE-backed firms, particularly concerning innovation and growth, remains a complex issue.

A study by Davis et al. (2014) offers a balanced perspective, acknowledging the operational efficiencies that private equity buyouts can introduce. Yet, they also illuminate the potential curtailment of certain aspects like R&D investments. This potential drawback is significant given that innovation is often a cornerstone for long-term growth and competitiveness in various industries. Furthermore, Strömberg (2008) delves into the evolving nature of private equity, hinting at the implications of certain modern PE practices on innovation. A salient point raised is

that while operational efficiencies might be achieved in the short term, the overarching impact on a firm's innovative capacity can be hampered.

2.1.2 Exit channels

Private equity firms have several options for exiting their investments in portfolio companies, the most common being initial public offerings, sales to strategic buyers and secondary buyouts. Empirical analysis (Schmidt et al., 2010; Møller & Holm, 2017) shows that more prominent and better-performing portfolio companies are more likely to be taken public, which is more evident after the 2008 global financial crisis with increased market volatility and uncertainty. Jenkinson and Sousa (2015) contributed to the literature by identifying time-to-exit and different specializations of GPs as essential determinants of the exit route while acknowledging that capital market conditions are the most critical (Ritter & Welch, 2002).

The idea that private equity exploits “windows of opportunity” and takes the exit route that maximizes value is consistent with fund managers’ perspective (Hutchings, 2010). However, IPO timing would have significant value implications. Listing immature portfolio companies destroys value and increases the risk of financial distress. Degeorge and Zeckhauser (1993) found that reverse LBO companies experience significant operating performance deterioration post-IPO. Cao (2011) conducted a more recent study using a larger sample and reached different conclusions – while IPO timing drives reverse LBO decisions, lockup provisions and concern for reputation help align incentives and mitigate the problem of asymmetric information.

Research by Jenkinson et al. (2022) provides a more comprehensive view of how private equity firms make exit decisions. Private equity firms usually need more time to achieve a quick exit from their investments as lockups, on average, expire after six months, and PE-backed IPOs demonstrate superior returns during lockups. Selling all stakes right after lockup periods expire would send a negative signal to the market (Myers & Majluf, 1984). Interestingly, the average duration of post-IPO holdings is three years. Results show that PE sponsors tend to anchor on IPO prices and are reluctant to sell losers; they can also hold on to their losers if the overall fund performance is strong as long as LPs do not pressure them to realize returns promptly.

2.2 Private equity ownership and post-IPO performance

2.2.1 Underpricing

The underpricing phenomenon in Initial Public Offerings has been a considerable research and debate subject. A stock is classified as underpriced when its closing price on the first day of trading exceeds its initial offering (Ljungqvist et al., 2006). Asymmetric information implies that underpricing in an IPO arises due to differences in information held by the involved parties, specifically the issuer, the investor, and the underwriter. Each party may possess varying degrees of information, influencing the decision to underprice the security. For instance, an underwriter with superior information may underprice the security to ensure a full IPO subscription, thereby boosting initial returns for current investors and enticing them to participate in subsequent IPOs and other offerings (Bergström et al., 2006).

2.2.2 Shareholder incentives

Ljungqvist and Wilhelm (2003) proposed the realignment of incentives theory, which suggests that during the dot-com bubble of 1999 and 2000, managers of companies going public were more inclined to leave “money on the table” due to changes in pre-IPO ownership structures and insider selling behaviors. Shifts in incentives led to a higher tolerance for underpricing. Sponsor-backed firms may strategically favor underpricing for various reasons. According to Bergström et al. (2006), private equity firms are incentivized to keep the IPO window open. They may use underpricing to create success stories that encourage more business in the future. Moreover, the financial sponsor may prefer to allocate shares to certain investors who are better positioned to generate long-term value in the company after it goes public, thus establishing a form of indirect influence over the firm. In the paper by Aggarwal et al. (2002), the authors found that managers utilize underpricing as a strategy to increase personal gains when the lock-up period extends, and the investor can, therefore, realize a greater return upon exit.

Conversely, this action carries reputational risks for the underwriter and the sponsor. If a security is underpriced, it might suggest that both parties cannot accurately determine its fair market value. In addition, the presence of a lock-up period, along with the active involvement post-IPO, provides additional motivation for PE sponsors to maximize gains from the IPO. As a result of these incentives, PE-backed companies tend to experience less underpricing, which is supported by studies conducted by Barry et al. (1990) and Megginson and Weiss (1991).

2.2.3 Asymmetric information

Rock (1982) introduced a model to explain the persistence of underpricing in IPOs due to asymmetric information. If the new issues are priced at their expected value, a group of investors with superior information would crowd out uninformed investors. Therefore, to attract uninformed investors to participate in the new issue, the offering company must price at a discount. Ritter (1984) applied the model proposed by Rock (1982) to the “hot issue” market of 1980 and discerned a correlation between uncertainty around the true value of the new issue and the level of underpricing, and higher uncertainty leads to greater underpricing. Hoque (2014) confirmed that high information asymmetry is related to underpricing and expanded the research by examining how asymmetric information and moral hazard impact IPO underpricing, suggesting that information mismatches between issuers and investors and insider strategic behaviors contribute to this phenomenon.

2.2.4 Certification

Furthermore, the role of certification theory (Booth and Smith, 1986) in the realm of private equity and venture capital has been a recurring theme, particularly concerning the market's perception of companies during their IPOs. Research by Megginson and Weiss on certification (1991) indicates that companies backed by venture capital often experience reduced initial returns and gross proceeds. This is because venture capital entities often serve as credible third-party certifiers, thereby lessening information asymmetry and subsequently reducing underpricing. Hopkins and Ross (2013) further this argument, emphasizing the importance of factors like the reputation of the private equity sponsor, the duration of their involvement, and the extent of retained ownership in influencing the certification process and mitigating underpricing. The sponsor is not the only agent that can certify quality, but investors also consider firm characteristics such as age, size, ownership stake, and underwriter as indicators of quality (Barry et al., 1990). The better the investor can monitor the company; the less underpricing is observed.

2.3 Previous findings

2.3.1 Underpricing

Furthermore, the role of certification theory (Booth & Smith, 1986) in private equity and venture capital has been a recurring theme, particularly concerning the market's perception of companies during their IPOs. Research by Megginson and Weiss on certification (1991) indicates that companies backed by venture capital often experience reduced initial returns and gross proceeds. Because venture capital entities often serve as credible third-party certifiers, lessening information asymmetry and reducing underpricing. Hopkins and Ross (2013) further this argument by emphasizing the importance of factors like the reputation of the private equity sponsor, the duration of their involvement, and the extent of retained ownership in influencing the certification process and mitigating underpricing. The sponsor is not the only agent that can certify quality; investors also consider firm characteristics such as age, size, ownership stake, and underwriter as quality indicators (Barry et al., 1990). The better the investor can monitor the company, the less underpricing is observed.

Regarding differences in operational performance among the three groups, Levis (2011) demonstrated that PE-backed firms tend to be larger, take on more leverage, and exhibit higher efficiency, measured by asset turnover. Additionally, PE-backed firms usually have robust earnings at the time of the IPO, while VC-backed firms display more fluctuations in earnings.

2.3.2 Long-term performance

Literature on the long-term post-IPO performance of companies specifically focused on sponsor-backed entities is scarce. Bergström et al. (2006) highlight that PE-backed firms outperformed non-buyout (NB) firms three years post IPOs, and more significant IPOs, on average, perform better. They hypothesize that larger IPOs are less subjected to changes in expectations by optimistic investors. The study of reverse leveraged buyouts (RLBO) conducted by Cao and Lerner (2009) contains a sample of 496 RLBOs in the US from 1980 to 2002. They find that RLBOs show consistent outperformance compared to other IPOs when controlling for size, industry, and investor sentiment over five years.

Moreover, they also highlight that RLBOs are, on average, larger and often more profitable. Levis (2011) examines the aftermarket performance of private equity on the London Stock

Exchange between 1992 and 2005 and concludes that PE-backed firms, three years post-listing, show superior operating and aftermarket performance compared to the overall IPO market. Furthermore, Levis notes a positive correlation between leverage and sponsors' ownership post-listing. Moreover, Levis (2011) discerned that PE-backed IPOs, compared to non-PE sponsored IPOs, were less frequently underpriced and consistently outperformed the market index for up to three years post-IPO.

On the other hand, views and research findings are challenging the performance of PE-backed companies. Alavi et al. (2008) suggested that PE-backed firms might trail their non-PE-backed counterparts due to the larger IPO size and higher associated costs, primarily driven by the PE firms' aggressive capital strategies. Distinguishing between PE and VC backing, a comprehensive study by Bain & Company, as noted by MacArthur and Lerner (2020), analyzed the performance of 90 PE-backed IPOs between 2010 and 2014, and their findings are surprising, with over 70% of the companies failing to outperform their industry benchmark in the five years post-IPO. Additionally, Chen and Liang (2016) found that firms backed by VC sponsors underperformed non-sponsored peers regarding return on assets after their IPOs, indicating that the sponsors' active ownership may not generate value after exiting their positions.

In general, evidence suggests that sponsor-backed firms show superior returns. Nevertheless, there appears to be disagreement regarding the drivers of the performance of sponsor-backed entities, with certain scholars contending that the outperformance may be linked to factors such as leverage, agency issues, and more attentive monitoring. However, the evidence supporting these claims needs to be more conclusive, as Levis (2011) noted.

3.0 Hypothesis

H1: Underpricing is prevalent across private equity-backed, venture capital-backed and non-backed firms in the context of Initial Public Offerings (IPOs).

The underpricing phenomenon of IPOs has been a topic of significant attention in financial literature. Hypothesis One posits that all three categorizations—private equity-backed, venture capital-backed, or non-backed companies—undergo a discernible underpricing, evidenced by the debut share prices typically being lower than the closing prices on the first day of trading.

H2: Publicly listed private equity-backed companies exhibit a lower degree of underpricing compared to venture capital-backed and non-backed firms.

Hypothesis Two stipulates that private equity-backed companies exhibit a lower degree of underpricing on the first day post-listing compared to their counterparts. One of the primary reasons behind this expectation is the certification effect provided by private equity firms. According to Hopkins and Ross (2013), private equity firms act as certifying agents, signaling to the market that the IPO has been thoroughly vetted and is of higher quality. The research identifies a significant correlation between the appeal of PE-backed IPOs and the private equity firm's reputation, duration of involvement and retained ownership. With their rigorous due diligence processes and reputation at stake, private equity firms instill greater confidence in potential investors. Consequently, there is a reduced information asymmetry, leading to lesser underpricing. Compared to NB firms and VC, the rigorous backing and oversight of private equity firms likely provide a more robust certification, reducing the uncertainty and, thus, the need for underpricing as a compensatory mechanism.

H3: Publicly listed companies backed by private equity sponsorship demonstrate superior long-term performance overtime compared to venture capital-backed and non-backed firms.

In the financial markets, private equity's role is often seen as a powerhouse, injecting companies with funds and strategic guidance, which leads us to Hypothesis Three. Research, exemplified by the work of Kaplan and Strömberg (2009), indicates that private equity firms engage in meticulous operational and strategic oversight, fostering growth and efficiency in their portfolio companies. This proactive engagement potentially drives the observed enhanced performance.

Consequently, we postulate that companies benefiting from private equity backing consistently deliver superior long-term outcomes.

***H4:** Publicly listed companies backed by private equity sponsorship manifest superior risk-adjusted returns compared to venture capital-backed and non-backed firms.*

While raw returns can be driven by multiple factors other than previous sponsorship, risk-adjusted returns serve as a pivotal metric, capturing both reward potential and underlying risk. Our fourth hypothesis suggests that private equity-backed companies, with their rigorous strategic guidance, operational enhancements, and structured governance, attain higher returns and do so with a balanced risk profile. By grounding our hypothesis in this detailed perspective, we seek to shed light on the nuanced interplay between sponsorship, risk, and post-IPO performance.

4.0 Data collection

Our study commences with a comprehensive collection of operational and IPO related data, spanning from January 2011 to December 2021, that has gone public on Nasdaq Stockholm (OMXS) and Nordic Growth Market (NGM). The 10-year period was chosen to reflect the more recent performance of companies in contrast to previous literature, which was primarily conducted on IPOs pre-2010. By extending our analysis to cover an entire decade, we aim to capture and analyze the more recent trends and patterns in the IPO landscape.

The next step involves identifying private equity and venture capital-backed companies, which is a challenging task due to the necessity of classifying each company accurately. To approach this problem, we propose adopting a methodology similar to that of Mogilevsky and Murgolov (2012) and Bergström et al. (2006), who employ a classification based on a database. In our paper, we will apply the same classification method by utilizing the definitions provided by CapitalIQ and Factset, which professionals in the field widely use. This choice ensures alignment with industry practices and increases our findings' reliability and consistency while following prior research.

Furthermore, to ensure robust classification, we use a dual-database approach, cross-referencing CapitalIQ and Factset to improve the accuracy of our data identification. Additionally, we refer to the definitions outlined by the Swedish Private Equity and Venture Capital Associations as an additional guiding framework. In cases where discrepancies in definitions arise, we acknowledge the need for subjective decision-making, applying careful consideration to maintain the integrity of our classification process. The data for operational and financial metrics were collected from CapitalIQ and Factset. In instances where a few companies were missing offer prices, we manually obtained the offer price from the respective companies' prospectus. In the end, the complete list consisted of 401 companies which can be found in the appendix.

5.0 Descriptive statistics

Table I presents the number of IPO's and the amount raised per sector. We investigate whether there is a distinction in the types of companies listed by financial sponsors and whether differences exist in their strategies. In Table I, we observe that the number of IPOs, private equity lists companies across a wide variety of sectors, with a slight bias towards Industrials (27%) and Consumer Discretionary (22%). On the other hand, Venture Capital does not exhibit the same breadth of industries, instead being more involved in healthcare (48%) followed by Industrials and Information Technology (20%). These findings are consistent with those of Warne (1988) indicating that Venture Capital's use a narrower strategy to specialize in selected sectors.

Regarding the amount raised, we see a similar pattern to the number of IPOs, and there are two notable differences. Venture capital-backed firms on an amount-raised basis raised a large amount of capital for a few companies in the Communication Service sector. For non-buyout firms, we observe a significant allocation of the capital raised directed towards the industrial sector. This inclination can be attributed to the capital expenditure-intensive nature of the industry. The inherent fixed costs in industrial operations result in elevated operational leverage, reducing optimal financial leverage (Chen et al., 2017). Furthermore, the preponderance of tangible assets and the extensive operational history typical of industrial companies enhance their capacity to garner substantial funds during Initial Public Offerings. The difference in the distribution of sectors between the three groups will have implications for the after-market performance.

Table I*Number of IPOs and amount raised (MSEK) by industry*

	Number of IPOs				Amount raised in IPO			
	PE	VC	NB	Total	PE	VC	NB	Total
Health Care	15%	48%	26%	27%	11%	46%	15%	13%
Industrials	27%	20%	17%	19%	27%	16%	43%	33%
Consumer Discretionary	22%	2%	10%	11%	19%	2%	7%	13%
Communication Services	11%	4%	10%	9%	10%	15%	1%	7%
Information Technology	16%	20%	16%	16%	13%	16%	3%	9%
Financials	5%	2%	7%	6%	19%	1%	10%	15%
Utilities	0%	0%	0%	0%	0%	0%	0%	0%
Consumer Staples	3%	2%	4%	3%	1%	2%	1%	1%
Real Estate	0%	2%	6%	4%	0%	3%	16%	7%
Materials	0%	0%	4%	2%	0%	0%	4%	2%
Energy	0%	0%	1%	1%	0%	0%	0%	0%
Sum	74	45	281	401	146,181	3,945	109,159	259,285

Table II provides a detailed examination of the three categorized groups' distinct characteristics spanning size, profitability, leverage, and operational efficiency. The data is derived from the fiscal year of each company's IPO. The data distribution shows a skewness from the provided mean and median values. On a broader scale, PE-backed entities not only portray a larger size, evidenced through indicators like market capitalization and total asset volume, but also show variation in several operational characteristics compared to their counterparts.

The distribution of market capitalization among PE-backed, VC-backed, and non-backed companies reveals distinct patterns:

- **PE-backed firms:** These firms generally have a market capitalization with a median of ~3,4bn SEK, but there are notable outliers -- EQT 85.8bn, Ahlsell 28.2bn, Nordnet 26.3bn, Truecaller 19.4bn, and Hemnet Group 17.9bn.
- **VC-backed firms:** These companies are generally smaller in scale than PE-backed and non-backed companies, as seen by the median of 13m. BioArctic stands out with a market capitalization exceeding 2bn at the time of IPO.
- **Non-backed firms:** The market capitalization distribution shows pronounced skewness, mainly due to mega IPOs. At the same time, the median is 29m. Some significant firms include Volvo Car 163bn, Storskogen Group 81.8bn, Vimian Group 31.5 bn, and Implantica 26.6bn.

From a profitability perspective, PE-backed firms generate a median EBITDA margin of 10% compared to VC at -23% and non-backed at -3% whereas the non-backed group's EBITDA margin is significantly negative due to certain outliers. The VC-backed group consistently reports negative EBITDA margins at the time of their market entry, which aligns with previous findings (Levis, 2011). Measured in median average asset turnover, PE-backed firms exhibit significantly higher efficiency at 87%, twice as high as NB and five times as high as VC.

Because of the leverage involved in private equity firms, it is not surprising that PE-backed firms demonstrate higher leverage levels. On average, PE-backed firms have 24% debt to assets, while the ratio is 8% for VC-backed IPOs and 11% for non-backed IPOs. However, the leverage ratio might be lower depending on the timing of reporting and the IPO, as financial sponsors tend to reduce leverage to present a more appealing image to investors before an IPO.

Similar to Levis (2011), we find evidence of variations in parameters like size, profitability, leverage, and operational effectiveness across the trio of groups, which is a reflection of the underlying selection criteria exercised by venture capital and private equity.

Table II*Firm characteristics across the three groups*

Variable (SEKm)	Mean	Median
<i>Panel A: Private Equity-backed IPOs</i>		
Market Capitalization	6,510	3,218
Gross Amount Raised	2,004	1,232
Revenue	3,267	1,600
EBITDA	303	179
EBITDA margin ¹ (%)	9%	10%
Total Assets	6,652	1,999
Leverage (debt to assets)	24%	24%
Asset Turnover (%)	86%	87%
Age	13	14
<i>Panel B: Venture Capital-backed IPOs</i>		
Market Capitalization	347	121
Gross Amount Raised	86	50
Revenue	94	13
EBITDA	-6	-12
EBITDA margin ¹ (%)	-46%	-23%
Total Assets	155	65
Leverage (debt to assets)	8%	1%
Asset Turnover (%)	60%	17%
Age	10	10
<i>Panel C: Non-Backed IPOs</i>		
Market Capitalization	1,828	146
Gross Amount Raised	387	30
Revenue	1,471	29
EBITDA	159	-4
EBITDA margin ¹ (%)	-13%	-3%
Total Assets	1,881	63
Leverage (debt to assets)	11%	5%
Asset Turnover	70%	37%
Age	12	7

¹(We apply an EBITDA margin constraint of -200%)

Table III provides an overview of IPO volumes by year from 2011 to 2021 in Sweden. The IPO market has witnessed noticeable fluctuations over the past decade. From a modest 9 IPOs in 2011, the market experienced a surge, reaching its peak in 2021 with 103 IPOs. The cyclical

over the eleven years is evident, with the IPO market being "hot" in 2014-2015 and 2021, interspersed with troughs in the earlier years and around 2018-2019.

A detailed breakdown reveals interesting trends among the three groups. Non-backed IPOs dominated the market in terms of sheer numbers. VC-backed IPOs remained relatively subdued, with the highest number of listings recorded in 2017 at 13. PE-backed IPOs saw a remarkable surge around 2015 and 2021, confirming previous literature that PE firms tend to list their portfolio companies during hot markets (Ritter, 1984). The distinct characteristics exhibited by the three groups can be due to various reasons. VC-backed companies might shy away from public listings because of a preference for alternative exit strategies, such as trade sales, which offer immediate exits without the lock-up periods associated with IPOs (Cumming and MacIntosh, 2003). In addition, regulatory challenges, and potential costs of going public can further deter early-stage and high-growth firms from choosing the IPO routes. On the other hand, PE-backed firms tend to be more mature and have undergone extensive operational and financial structuring, which makes them better poised for public listings. Meanwhile, a much larger pool of companies does not have prior institutional backing, and they may feel more comfortable going listed when the market sentiment is favorable.

Table III

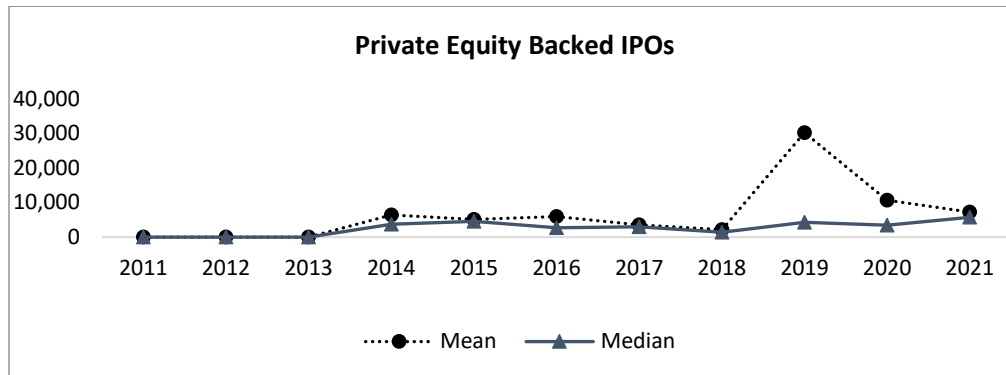
Number of IPOs in each group by year from 2011 to 2021

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
NB	7	4	4	25	25	36	44	25	13	19	79
VC	2	0	1	9	2	5	13	2	4	2	5
PE	0	0	0	5	14	11	11	8	3	3	20
Total	9	4	5	39	41	52	68	35	20	24	103

Graphs I-III delineate the mean and median market capitalization at the point of listing, segmented annually for the three categories. The data in Graph I reveals that the median market capitalization has exhibited a slightly upward growth for PE-backed IPOs, with a noticeable bump due to the EQT's mega IPO in 2019.

Graph I

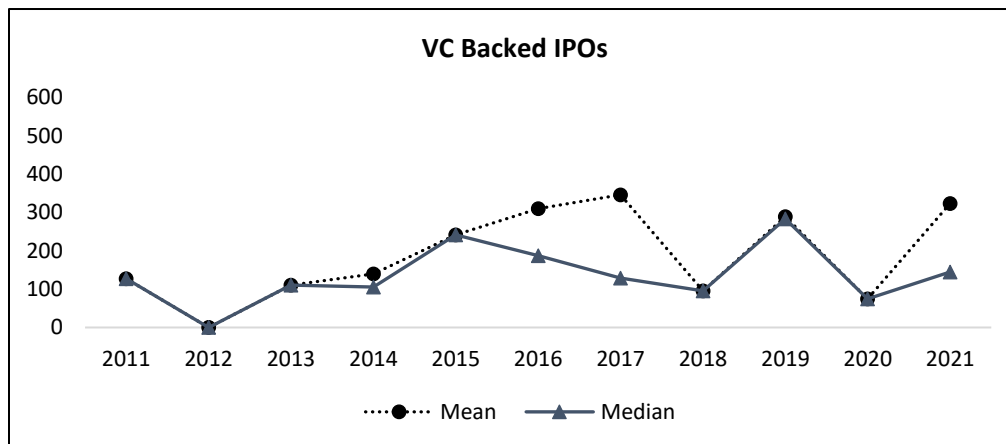
Mean and medium market capitalization over time (PE-backed group)



The VC-backed segment exhibits noticeable fluctuations in the median market capitalization over the years. Meanwhile, the mean shows an upward trend between 2012 and 2015, followed by fluctuations with peaks in 2019, and 2021.

Graph II

Mean and medium market capitalization over time (VC-backed group)

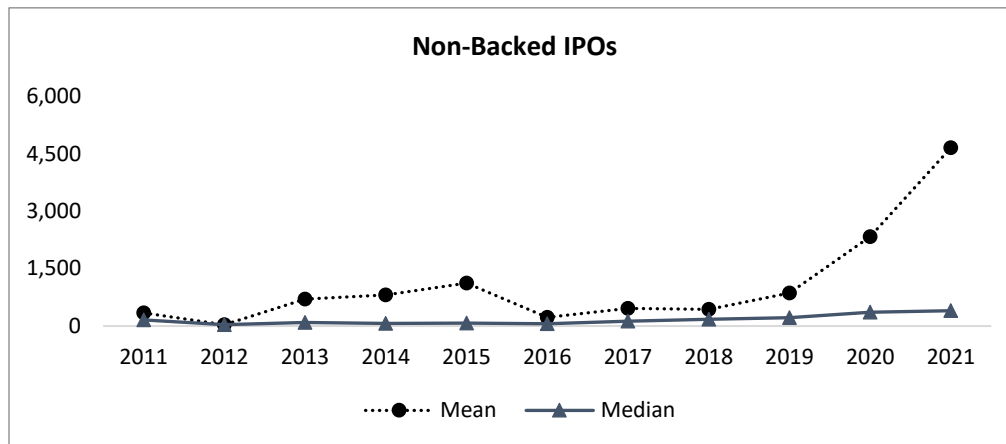


For the non-backed group, the median market cap has risen gradually, while the mean market capitalization has experienced a more pronounced upswing, particularly towards 2021, indicating a significant increase in the average size of non-backed companies going public. The divergence

between the mean and median suggests that there are some particularly large IPOs driving the average upwards.

Graph III

Mean and medium market capitalization over time (Non-backed group)



6.0 Contribution to current literature

Our research offers a unique perspective on the underpricing and long-term post-IPO performance of the Swedish market's PE-backed, VC-backed, and non-backed firms. The current literature predominantly revolves around larger markets, such as the US or the UK, leaving a gap in understanding specific regional dynamics like those of Sweden. Furthermore, the literature is scarce when it comes to covering PE-backed companies' performance with a large share of scholars researching VC-backed performance. By offering a comparative analysis of firms with varying financial backing, our study uncovers the differential impacts of these structures on both immediate underpricing and sustained post-IPO performance. We aim for our paper to provide a comprehensive background on the performance of sponsor-backed companies, hoping to generate interest in the dynamics of private equity in Sweden and serve as a starting point for further exploration.

7.0 Methodology

This section outlines the overall research design, explaining the choice of methods and how they contribute to understanding the research problem. While sections 7.1 and 7.2 focus on underpricing, in section 7.3 we switch to examine long-term performance.

7.1 Underpricing

We follow a methodology similar to Ritter's (1991), measuring underpricing through the initial return period of an IPO. We calculate the initial return by taking the difference between the offer and closing prices on the first day of trading. In addition, to fully capture the underpricing effect, we vary the initial return length period to other days past the first day of trading. If we cannot access the offering price, we will use the opening price instead. According to Bergström et al. (2006), the opening and offer prices show expectantly minor differences. The initial return can thus be expressed as follows:

$$r_i = \ln \left(\frac{p_{i,closing}}{p_{i,IPO}} \right)$$

Where $p_{i,IPO}$ is the offer price of firm and $p_{i,closing}$ is the closing price of the same firm at the end of the initial return period. In the next step, we calculate the abnormal returns by adjusting the initial return similarly to previous studies (Levis, 2011) with a benchmark. The OMX Stockholm all share (OMXS) and Stockholm 30 (OMX30) has been chosen as the most appropriate option for this study. However, we acknowledge that no perfect benchmark is available, considering the time period and the differences in both size and sectors between our equities and the index. The formula can therefore be expressed as:

$$AR_{it} = r_{it} - r_{mt}$$

Where ar_{it} indicates the abnormal return over the period, r_i the initial return and r_{mt} the benchmark returns for the same period.

Choice of benchmark

Regarding benchmarks, we have selected the and the OMXS and OMX30. The decision to compare returns against multiple benchmarks is based on previous literature by Loughran and Ritter (1995) and Levis (2011), which suggests that performance is sensitive to the choice of benchmark. Therefore, comparing returns to different benchmarks will increase robustness and provide a more comprehensive view. The OMX Stockholm 30 comprises the 30 most traded stocks and operates as a capitalization-weighted index on the Nasdaq Stockholm stock exchange. In contrast, the OMX Stockholm index encompasses all shares traded on the Nasdaq Stockholm stock exchange.

Multivariate regression – underpricing

Most previous research in the field has used multivariate regression to determine underpricing, such as the papers by Mogilevsky and Murgolov (2012) and Barry et al. (1990). To ensure comparability of our findings, we will employ a similar approach to that used in prior research. The regression will be based on the following characteristics: PE, VC, Stock exchange (SE), Age, Market Capitalization (MC), Asset Turnover (AT) and Leverage (LEV), with all the metrics measured at the time of the IPO. Further details about these variables will be elaborated on later in this section. We will also control industry specific and time-fixed effects. Thus, the base regression can be expressed as:

$$ar_i = a + \beta_1 PE + \beta_2 VC + \beta_3 SE + \beta_4 AGE + \beta_5 MC + \beta_6 AT + \beta_7 LEV + \beta_j IND_j + \varepsilon_i$$

PE: Dichotomous variable for defining if the company is a Private Equity backed firm

VC: Dichotomous for defining if the company is a Venture Capital backed firm

SE: Dummy variable taking a value of 0 if listed on Nasdaq Stockholm and 1 if listed on NGM

AGE: Age of the company at the day of the IPO

MC: Market Capitalization (LOG) at the day of the IPO

AT: Asset Turnover (Sales/Assets)

LEV: Leverage (Debt/Total assets)

IND_j: Dummy variables for the *i*-th company determining with the base industry being

Healthcare. IND₈: Industrials, IND₉: Consumer Discretionary, IND₁₀: Communication Services,

IND_{11} : Information Technology, IND_{12} : Financials, IND_{13} : Utilities, IND_{14} : Consumer Staples, IND_{15} : Real Estate, IND_{16} : Materials, IND_{17} : Energy

7.2 Variables – Underpricing

Firm age

Previous research has shown a negative correlation between the age of the issuer and underpricing, as evidenced by the observations of Mogilevsky and Murgolov (2012). Similar findings are also found in Ritter's (1984) study, where it is theorized that more established firms tend to have lower levels of information asymmetry mainly due to the accessibility of public information. Consequently, this leads to a decrease in underpricing during an IPO.

Market Capitalization

The size of the firm during the IPO is a crucial factor, and various metrics, including market capitalization, issue size, and asset size, have been proposed by different scholars to measure it. Levis (2011) underscores the significance of market capitalization, particularly in the context of firms backed by private equity. Larger market capitalization suggests a higher company value, attracting more investors and reducing information asymmetry. With increased investor interest, there is less need for compensation for risk, leading to diminished uncertainty. Therefore, we focus on market capitalization as a key metric, as it aligns with the rationale of reduced information asymmetry and enhanced investor interest.

Industry

The characteristics between different industries can substantially differ and consequently affect aftermarket performance. Ritter (1984) found that financial institutions listed from 1983 to 1984 experienced a high initial return, primarily due to rising interest rates from 1985 to 1986. Conversely, oil and gas companies heavily underperformed as the oil and gas price declined substantially soon after their listing. Therefore, industries are influenced differently during different economic cycles as demands for goods and services fluctuate with higher activity, with heightened market activity leading to higher initial returns.

Stock exchange

The choice of where to list can also influence the degree of underpricing, as reported by Howton et al. (2002), who examined the impact of listing on the Nasdaq versus the New York Stock Exchange (NYSE). The authors found that going public on the Nasdaq resulted in higher aftermarket returns than the NYSE. These results were consistent even when considering size and industry.

Leverage

Higher leverage is associated with greater financial risk, as indicated in a study by Su (2004), which found that firms with higher leverage exhibited a higher degree of underpricing. These findings were supported by Moeli and Vismara (2014) and Ong et al. (2020), who also noted a negative relationship between leverage and IPO offer price. Subsequently, the higher leverage associated with greater financial risk led to underwriters issuing stock at a lower price to compensate for information asymmetry, increasing underpricing. On the contrary, it can also be argued that higher leverage is a positive signal and reduces underpricing. In a study by Kim et al. (2007) examining how leverage influences the underpricing of low-technology and high-technology companies in the US, the authors argue that leverage serves as a signal of quality for low-tech firms, thereby reducing information asymmetry.

Conversely, opposite findings are reported for high-tech firms. An explanation for this is based on the pecking order hypothesis that a firm prefers internal to external financing, and that debt is preferred over equity. Consequently, following signaling theory, higher leverage can be seen as a positive signal for investors, therefore reducing information asymmetry (Ong et al., 2020).

Asset turnover

The efficiency of a firm, measured by asset turnover, is found to be higher in private equity-backed firms than their counterparts, as demonstrated in a paper by Levis (2011), highlighting that private equity firms have higher asset turnover than VC and non-backed buyout firms. Previous studies by Loughran and Ritter (1995) and Boulton et al. (2010) indicate that solid firm fundamentals reduce underpricing in an IPO. Therefore, high-performing firms are expected to exhibit less information asymmetry and, post-IPO, should experience reduced underpricing.

7.3 Long-run performance

Buy-and-hold-abnormal returns

The long-term aftermarket performance is measured using the buy-and-hold abnormal returns (BHARs) method, as Barber and Lyon (1997) advocate. Compared to another widely used cumulative abnormal returns (CARs) method, buy-and-hold abnormal returns account for the compounding effect and better reflect a company's performance over a long period. The methodology is illustrated as:

$$bhar_{it} = \prod_{t=1}^T (1 + r_{it}) - \prod_{t=1}^T (1 + r_{mt})$$

where r_{it} represents the total return which includes both price appreciation and dividends, providing a more accurate reflection of the return to an investor of stock i at time t , and r_{mt} measures the return of the benchmark at the same time. Furthermore, BHAR are presented on both an equally weighted and value-weighted basis, utilizing market capitalization adjusted for inflation. Equally weighted BHAR for each portfolio can be expressed with the following formula:

$$BHAR_{pt}^{EW} = \frac{1}{n_p} \sum_{i=1}^{np} bhar_{it}$$

Where p indicates one of the three groups (i.e., PE, VC, or NB) at time t . However, an equally weighted portfolio is unlikely to be held from an investor's perspective (Bergström et al., 2006; Levis, 2011). Instead, like an index, we use a value-weighted approach to create a portfolio, which aligns more with how a standard portfolio would be constructed. The formula for a value-weighted portfolio is expressed as follows:

$$BHAR_{pt}^{VW} = \sum_{i=1}^{np} w_i \times bhar_{it}$$

Where w_i denotes the weight based on inflation adjusted market capitalization in relation to the total portfolio and $BHAR_{pt}^{VW}$ is summation of the weighted BHAR for portfolio p at time t .

Wealth Relative

In line with previous studies such as Bergström et al. (2006), Levis (2011) and Ritter (1991) we measure performance based on relative wealth to compare portfolio returns with those of the benchmark, as expressed below:

$$WR = \ln \left(\frac{(1 + r_{it})}{(1 + r_{mt})} \right)$$

Where r_{it} again represent total return of the stock r_{mt} the benchmark return. The above formula shows the relative performance of a stock against the benchmark for the given horizon; a ratio above one means that the stock overperformed relative to the market.

Multivariate regression long term performance

In this regression, we test our hypothesis regarding the three years of post-market performance, drawing inspiration from models proposed by Levis (2011), Bergström et al. (2006), and Mogilevsky and Murgulov (2012). The model is as follows:

$$WR = a + b_1FDR + b_2PBV + b_3LEV + b_4AT + b_5MC + b_6PE + b_7VC + \varepsilon_i$$

Regarding the first-day return (FDR), we anticipate this variable to be negative in line with Levis (2011) and Purnanandam & Swaminathan (2004), as the underpricing cannot be sustained over time, and the valuation will correct itself over time. The price-to-book (PBV) value is intended to capture the sentiment of investors regarding the company's perceived value.

In addition to these financial metrics, we also control for several operational factors. These operational factors include the degree of riskiness in leverage calculated as debt to assets, expressing the company's efficiency as asset turnover, and considering the firm's size through market capitalization akin to our regression for underpricing. These variables allow us to account for key operational factors that influence long-term performance.

Furthermore, we introduce a dichotomous variable for private equity and venture capital, where one represents if the firm is sponsor-backed and zero otherwise. This variable enables us to explore how the presence of private equity or venture capital sponsorship influences long-term returns. By considering a broad set of financial and operational variables, we aim to provide a more comprehensive understanding of the factors contributing to long-term performance.

7.4 Potential biases

In any empirical analysis, recognizing and addressing potential biases is crucial to ensuring the integrity and robustness of the findings. This study acknowledges several biases that could influence the evaluation of post-IPO performance of companies with different financial backings.

Omitted Variables Bias

In this study, we conducted multivariate analysis to examine the complex relationships between various independent variables and the post-IPO performance of firms both in the short and long run. An inherent challenge in regression analysis is ensuring the inclusion of all relevant variables. Omitted variables bias can compromise the validity of our results if key determinants of post-listing performance are excluded from the model. To mitigate this, the study has thoroughly reviewed existing research literature to identify and incorporate key determinants of post-listing performance into our analytical model. In addition, the study has applied stepwise regression to enhance the robustness of our findings.

Rebalancing Bias

In the context of stock performance over a multi-year period, rebalancing bias can occur due to changes in the composition of market indices. Such index rebalancing may give rise to systematic variances that are not attributable to the innate performance of the firms themselves.

To mitigate the potential effects of rebalancing bias in our analysis of post-IPO performance, we have incorporated time-fixed effects within the multivariate analysis. The time-fixed effects control for unobserved, time-specific factors that affect all firms uniformly, such as macroeconomic shifts or industry-wide trends. By doing so, we can isolate the intrinsic performance of the individual stocks from the broader movements merely as a consequence of index rebalancing.

Skewness Bias

The data for our study, such as market cap and return, exhibit non-normal distributions, leading to skewness bias. Our study addresses this by employing log transformations to the return and market cap data. Log transformations are particularly effective in stabilizing variance and normalizing right-skewed distributions, a common characteristic of financial return data. This transformation makes the data more amenable to linear modeling and reduces the impact of extreme values.

Outliers

Outliers pose a considerable challenge in financial analyses, as they can disproportionately influence the measures of central tendency and dispersion. In the context of this study, outliers could represent firms with exceptionally high or low post-IPO performance, which could skew the overall analysis. To mitigate the impact of these outliers, we apply a 5% winsorization. This approach effectively reduces the skewness caused by unusual post-IPO performances, thus ensuring a more balanced and representative analysis.

8.0 Results

The subsequent section outlines the results of our analyses and the determination regarding our hypotheses. Section 8.1.1 delves into Hypothesis One: Underpricing is prevalent across private equity-backed, venture capital-backed and non-backed firms in the context of Initial Public Offerings (IPOs). Section 8.1.2 and 8.1.3 address Hypothesis Two: Publicly listed private equity-backed companies exhibit a lower degree of underpricing compared to venture capital-backed and non-backed firms.

Section 8.2.1 explores Hypothesis Three: Publicly listed companies backed by private equity sponsorship demonstrate superior long-term performance overtime compared to venture capital-backed and non-backed firms. Finally, Section 8.2.2 evaluates Hypothesis Four: Publicly listed companies backed by private equity sponsorship manifest superior risk-adjusted returns compared to venture capital-backed and non-backed firms.

8.1 Underpricing

8.1.1 Univariate analysis

Table IV summarizes the average first-day abnormal return by listing year data. It illustrates that the average first-day returns vary by group and by year. The data shows a downward trend in average underpricing for the non-backed group over the years. Conversely, the VC-backed group experiences more fluctuations in underpricing, which could indicate higher volatility. However, we also must be cautious with the interpretation since the number of listings varies significantly between the years. In contrast, the PE-backed group's underpricing levels remain relatively consistent, suggesting greater stability in their average first-day returns.

Table IV*Average first-day abnormal return by listing year*

	All	PE	VC	NB	All	PE	VC	NB
Year	<i>Abnormal return</i>				<i># Listings</i>			
2011	30.0%	n.a.	38.7%	27.5%	9	0	2	7
2012	26.7%	n.a.	n.a.	26.7%	4	0	0	4
2013	21.5%	n.a.	60.8%	11.7%	5	0	1	4
2014	8.8%	7.1%	-5.6%	14.4%	39	5	9	25
2015	15.3%	15.1%	27.7%	14.4%	41	14	2	25
2016	16.4%	12.8%	28.3%	15.4%	52	10	6	36
2017	12.6%	10.6%	14.3%	12.5%	68	11	13	44
2018	-0.7%	0.9%	-27.0%	0.9%	35	8	2	25
2019	10.0%	11.4%	8.9%	10.0%	20	3	4	13
2020	7.2%	14.3%	-26.4%	9.7%	24	3	2	19
2021	10.0%	12.8%	21.1%	8.6%	103	19	5	79

According to Ritter (1991), underpricing can vary widely between industries. Consequently, we analyze a table of average abnormal returns for the 11 industries according to the GICS industry classification, as presented in Table V. Overall, we observe that underpricing is highest for Health Care, Financials, and Materials. At the same time, it is lowest for Energy, Utilities, and Real Estate. Interestingly, the latter industries share many similar characteristics regarding tangible assets and predominantly stable, cash-generating assets. This may explain why underpricing is lower in these sectors, as valuing this type of asset is easier. For the former, we hypothesize that these industries might be more challenging to evaluate due to their complexity and uncertainty, especially true for Materials and Health Care, leading to greater underpricing. We must be mindful that this analysis disregards many other important variables, such as size and year. However, we do not observe significant differences between PE and non-buyout regarding returns, except in Materials and Health Care. On the other hand, venture capital shows significantly higher underpricing for most industries, which is also related to the few observations.

Table V*Average first-day abnormal return by GICS industry classification*

	All	PE	VC	NB	All	PE	VC	NB
Industry	Abnormal return				# Listings			
Health Care	14%	10%	1%	18%	107	11	22	74
Industrials	11%	7%	23%	10%	76	20	9	47
Consumer Discretionary	8%	14%	40%	3%	45	16	1	28
Communication Services	10%	13%	14%	9%	38	8	2	28
Information Technology	11%	15%	10%	11%	66	12	9	45
Financials	15%	10%	104%	11%	24	4	1	19
Utilities	5%	n.a.	n.a.	5%	1	0	0	1
Consumer Staples	11%	10%	43%	8%	13	2	1	10
Real Estate	7%	n.a.	1%	7%	17	0	1	16
Materials	13%	n.a.	n.a.	13%	10	0	0	10
Energy	5%	n.a.	n.a.	5%	3	0	0	3

Table VI delves into the workings of underpricing variations across the three identified groups, employing both equally weighted and value-weighted methodologies. Each group presents a significant underpricing pattern. A clear difference can be seen between the average underpricing values when comparing the equally weighted and value-weighted methods. This difference highlights that more significant IPOs tend to have more noticeable underpricing, a trend observed in previous research (Smith, 2005).

Table VI*First-day underpricing reported on an equally and value weighted basis*

Hypothesis testing	Equally weighted underpricing			Value weighted underpricing		
	PE	VC	NB	PE	VC	NB
Mean	11.2%*** (6.759)	11.6%* (2.212)	11.3%*** (6.528)	16.3%*** (9.608)	27.8%*** (6.738)	20.0%*** (20.136)
SD	0.14	0.35	0.01	0.02	0.04	0.29

Note: significance *p < 0.1, ** p < 0.05, *** p < 0.01

From an equally weighted perspective, the underpricing means across PE, VC, and NB are relatively clustered around the 11% mark. On average, companies across these three funding types tend to have comparable levels of underpricing when each IPO is given equal weight. PE-

backed IPOs have a slightly lower level of underpricing than the other two groups. However, the standard deviation values indicate higher volatility in VC-backed IPOs than PE and NB, pointing to a potentially riskier or more unpredictable underpricing landscape for venture-backed entities. This increased uncertainty resonates with Ritter's (1991) argument that firms backed by venture capital often face unpredictable underpricing because they are naturally more speculative.

On the other hand, the value-weighted approach paints a different narrative. Here, VC-backed IPOs demonstrate significantly higher underpricing than PE and NB. This would imply that larger VC-backed companies, which would have more influence in a value-weighted scheme, tend to experience higher underpricing, which contrasts with previous hypotheses that size should reduce information asymmetry. The considerably lower standard deviations in the value-weighted analysis than the equally weighted one suggest that outliers have less impact when the size or value of the IPO weights the analysis, which could mean that the larger, more dominant players in each category exhibit more consistent underpricing behaviors, whereas smaller companies could introduce more variability.

Examining the means from both approaches, PE-backed IPOs exhibit the least underpricing on average. Assessing the statistical significance of the disparities between PE-backed entities and their VC and NB counterparts is essential to gaining a deeper understanding.

8.1.2 Difference in the levels of underpricing between PE, VC and NB

Table VII shows no strong evidence suggesting significant differences in underpricing between the PE, NB, and VC categories in the equally weighted scenario. In contrast, in the value-weighted scenario, there are indications of significant differences between these three categories. Specifically, VC-backed IPOs exhibit a higher level of underpricing than PE-backed and non-backed counterparts. PE-backed IPOs display less underpricing than non-backed IPOs on a 10% significance level.

To align the findings with previous research, Ritter's data from 1998 to 2021 shows that in the United States, VC-funded companies experienced an average first-day underpricing of around 36.0%, leaving a significant amount of money "on the table" (Ritter et al., 2022; Shuwaikh et al., 2023). This extensive underpricing could be related to the increased risk perception and higher expected returns from investors. The result partially aligns with Levis (2011), who found that on

the London Stock Exchange from 1992 to 2005, PE-backed companies experienced the lowest average first-day underpricing. The disparity among the three groups (PE-backed, VC-backed, and non-backed) was less pronounced and significant on a value-weighted basis. However, Levis (2011) also posited that non-backed companies had the highest level of underpricing. The differences in our results might be due to the studies' varying time frames and stock exchange.

Table VII

T-test results for comparing mean underpricing of PE, VC and NB groups

Groups tested	P-value
<i>Equally weighted</i>	
PE vs NB	0.966
PE vs VC	0.802
NB vs VC	0.817
<i>Value weighted</i>	
PE vs NB	0.086
PE vs VC	0.004
NB vs VC	0.009

8.1.3 Multivariate Analysis

A multivariate analysis is conducted to examine known factors' impact on underpricing and test H1 and H2 by controlling for these factors. We acknowledge that the R-squared value is at most 0.139 in regression (3), which reduces the model's explanatory power. Additionally, we investigate the robustness of the model in terms of multicollinearity using a VIF test, which can be found in the appendix. The result of the VIF test shows that all the variables are in the 1 to 3 range, which is within an acceptable range. Thus, we can conclude that there is no apparent multicollinearity among the independent variables.

In Table VIII, the Private Equity variable has a significant negative coefficient of 0.099 in regression (1) and -0.151 in regression (3); as such, we can conclude that the H2 is confirmed, indicating that PE-backed firms experience a lower degree of first-day underpricing compared to the other groups, which is in line with what we expected given that these firms should exhibit less uncertainty prior to being listed. These results align with Bergström et al. (2006), who found that private equity firms tend to experience less underpricing, primarily because their certification role reduces adverse selection. This is consistent with the observations of

Meggison and Weiss (1991). Bergström et al. (2006) highlighted that private equity firms conduct thorough due diligence, so companies backed by such firms signal higher quality, contributing to lower underpricing. Also, as described in earlier sections, PE-backed companies are usually subject to more information disclosure, which should reduce information asymmetry and, consequently, underpricing. In contrast, these findings speak against the hypothesis that Private Equity firms tend to be more underpriced to create "success" stories and to keep the IPO window open.

Our observation reveals that venture capital-backed firms do not have significantly different underpricing levels than non-backed firms. This aligns with Bradley and Jordan's (2002) findings, which suggest no underpricing difference between VC-backed and non-backed firms when industry effects are controlled. The negative -0.029 value in regression (3) might indicate that venture capitalists act as certifiers of a company's true value, similar to private equity, potentially reducing underpricing. However, this contrasts with our earlier findings of higher underpricing in VC-backed firms. A possible reason could be that larger VC-backed IPOs tend to be more underpriced, as the Market Capitalization (LOG) variable indicates. Additionally, Barry et al. (1990) study from 1978 to 1987 showed that certain factors, like ownership and the number of venture capital firms investing, negatively correlate with underpricing. The variable Market Capitalization (LOG) presents a coefficient of 0.049 in regression (3) and is significant at all levels. This suggests larger firms experience more underpricing, which is in contrast with previous literature by Vlad and Zoltan (2012) and Ritter (1991), who hypothesize that larger firms should reduce uncertainty ex-ante about a company's prospects.

Similar to the findings of Mogilevsky and Murgulov (2012), our study reveals no statistical significance in operating performance metrics, including asset turnover and leverage. However, our results regarding firm age differ from those of Clark (2002), who identified firm age as a contributing factor to underpricing.

From a sectoral perspective, differences in underpricing are evident. Notably, firms in the real estate and utilities sectors, with statistically significant coefficients of -0.025 and -0.023, exhibit a lower degree of underpricing. The nature of the real estate sector, which often includes tangible assets, long-term investments, and potentially more stable returns, might contribute to a more precise valuation, reducing underpricing. However, as shown before, these results should be carefully observed as the real estate industry is only a small subset of our sample. Therefore, we cannot verify the result with certainty.

Table VIII

OLS Regression of first-day underpricing (robust standard errors)

	AR (1)	AR (2)	AR (3)
Constant	-0.046	-0.071	-0.085
Private Equity	-0.099**	-0.130***	-0.151***
Venture Capital	-0.004	-0.017	-0.029
Stock Exchange	-0.053	-0.046	-0.049
Age	-0.001	-0.001	-0.001
Market Capitalization (LOG)	0.033***	0.040***	0.049***
Asset Turnover	0.017	0.022	0.023
Leverage	-0.042	0.105	0.106
Industrials		-0.054	-0.045
Consumer Discretionary		-0.039*	-0.028
Communication Services		-0.012	-0.003
Information Technology		-0.005	0.003
Financials		-0.012	-0.008
Utilities		-0.032***	-0.023*
Consumer Staples		-0.006	-0.005
Real Estate		-0.026***	-0.025***
Materials		-0.004	-0.003
Energy		-0.007	-0.004
Time-fixed effects	No	No	Yes
R2	0.061	0.080	0.139
Number of observations	401	401	401

Note: significance *p < 0.1, ** p < 0.05, *** p < 0.01

8.2 Long-term performance

Table IX provides an overview of the yearly calendar-time BHAR 36-months spanning from 2011 to 2020. Upon scrutinizing the sample, noticeable variations in BHAR emerge across the years for equally weighted portfolios. The lowest BHAR was recorded in 2020 at 34.9%, while the peak occurred in 2015 at 51.7%. Notably, around 2014-2015, IPOs performed exceptionally well, coinciding with a hot market in Sweden marked by a surge in listings. PE-backed firms showcase consistently positive performance, with the only downturn observed in companies listed in 2020. This contrasts sharply with VC and non-buyout counterparts, exhibiting negative returns from 2018 to 2020. These findings, where PE seemingly outperforms other classes across all periods, align with Bergström et al.'s (2016) discovery of PE-backed firms consistently outperforming counterparts on the London Stock Exchange and the Paris Stock Exchange.

Interestingly, in a previous study, Gompers and Lerner (2003) highlighted significant fluctuations in abnormal returns for companies listed on Nasdaq between 1936 and 1976. Similar volatility was also identified in Levis' (2011) study on listings on the London Stock Exchange during 1992-2005. In contrast, our findings reveal a more consistent pattern with less volatility, especially PE-backed firms, showcasing a five-year streak of positive returns before turning negative. This may be partly attributed to differences in the listing requirements, the regulatory environment between Sweden and the US, and a difference in time periods observed. The value-weighted results uncover notable differences for PE-backed firms, particularly the cohorts of IPOs in 2019 and 2020, displaying solid performance and reinforcing the notion that PE-backed firms exhibit superior returns over time. While NB and VC firms demonstrate an overall improvement on a value-weighted basis, they are still significantly behind PE-backed firms in return.

Table IX*36-months BHAR between 2011-2020*

	All	PE	VC	NB	All	PE	VC	NB
Year	Equally Weighted				Value Weighted			
2011	-23.0%	n.a.	10.7%	-32.7%	-33.7%	n.a.	-115.8%	-25.2%
2012	21.7%	n.a.	n.a.	21.7%	43.2%	n.a.	n.a.	43.2%
2013	12.6%	n.a.	-95.4%	39.6%	61.2%	n.a.	-95.4%	67.4%
2014	16.1%	50.9%	71.1%	-7.7%	53.9%	38.9%	67.4%	74.5%
2015	51.7%	35.6%	260.1%	41.8%	22.0%	16.5%	112.5%	33.4%
2016	22.0%	-0.1%	1.0%	29.8%	7.9%	7.1%	4.0%	14.8%
2017	6.1%	35.3%	6.9%	-1.9%	15.5%	7.4%	47.9%	26.1%
2018	-6.4%	183.5%	-54.1%	-62.5%	69.6%	135.2%	-35.1%	-29.0%
2019	-18.5%	23.9%	-17.0%	-29.7%	106.1%	123.3%	13.1%	-23.1%
2020	-34.9%	-18.0%	-101.9%	-30.6%	11.3%	46.5%	-100.4%	-13.7%

8.2.1 Equally weighted & value weighted BHAR

The examination of the three groups against the OMXS and OMXS30 indexes reveals distinct performance patterns in Table X. The BHAR for the complete sample period of IPOs spanning from 2011 to 2021, using a 12-month interval. The comparison involves three groups, NB, PE, and VC, against OMXS and OMX30 benchmarks. As shown in the descriptive data, the sample size undergoes reductions due to factors such as delistings, mergers, bankruptcies, and the inclusion of IPOs listed in 2021; overall, our results are consistent with previous research by Levis (2011) and Ritter (1991).

NB firms show a statistical return of 9.5% and 11.0%, respectively, for equally weighted returns in the first 12 months when compared to both indexes. PE and VC are not statistically different from zero during the same period, with PE showing meagre first-year returns. In contrast, PE-backed companies show significant returns at 26.1% in the 24 months compared to the OMX 30. There are, however, striking differences between the groups in the 36 BHAR aftermarket performance, where PE, compared to OMXS, achieves a return of 22.8%. In contrast, NB firms show a negative return of -12.8%. The consistent outperformance of PE-backed firms over the 24-month and 36-month time frames is in line with the findings of Levis (2011), reinforcing the notion that PE firms excel in creating value over a medium- to long-term horizon. This could be

attributed to their hands-on approach and the implementation of best practices that drive operational efficiencies and synergies post-listing. We generally observe that PE increases returns over time compared to the benchmark, while NB shows the opposite; for VC, we observe no such patterns, with returns fluctuating over the three years.

On a value-weighted basis, VC still shows no statistically significant results for any sample periods. This aligns with Levi's (2011) findings, except in the 12 months after the IPO. However, in comparison to Levi's study, we observe the returns to fluctuate significantly between outperforming and underperforming the benchmark. At the same time, Levi finds VC firms to underperform the benchmark continuously over the 36 months. The inconsistent pattern is mainly caused by Powercell Sweden and Xspray Pharma performance, which generates high excess returns for 12-month and 36-month periods. However, another explanation can be found in the paper by Bessler and Seim (2012), who note that VC performance is superior in the first year and then starts to decline. They postulate that the cause may be related to the end of the one-year lock-up period as VCs start selling their shares. As, VCs tend to take companies public during hot markets, leading to overvaluation and high initial returns, which is then corrected over time. This aligns with our findings that VC firms show significant underpricing the day after listing and higher first-year returns.

Value-weighted returns present a slightly different narrative for PE- and NB-backed firms. The latter shows significant underperformance against the OMXS over all three periods. The sustained underperformance of non-backed firms can potentially highlight a gap in resources and strategic advantages that sponsored firms might leverage, aligning with the resource-based view elaborated by Barney (1991). Remarkably, the outcomes show a notable contrast when comparing OMXS with the OMXS 30. Specifically, in BHAR 36 months, the figures go from -26.0% for OMXS to 22.5% for OMXS 30, highlighting that the largest companies in Sweden showed poor performance compared to NB for the observed periods.

Private equity-backed firms consistently outperform both benchmarks and exhibit statistically positive returns over the entire sample period. Notably, there is a significant upswing in returns during the 24 months, partially driven by EQT. Furthermore, we observe that PE-backed firms outperform both benchmarks, aligning with the findings in the study on reverse LBOs by Cao and Lerner (2009), which indicates that PE-backed IPOs in the US exhibit more robust

performance across multiple benchmarks. It is also worth noting that Nordic PE-backed firms show higher returns than Cao and Lerner's (2009) study in the US and Levis' (2011) UK studies. Moreover, in line with Cao and Lerner (2009), we do not find any significant deterioration in returns over time for PE-backed IPOs.

Table X

Buy and hold abnormal returns reported for 12, 24 and 36 months on equally and value weighted basis

Months	Equally Weighted		Value Weighted	
	OMXS	OMXS30	OMXS	OMXS30
<i>Panel A: PE-Backed</i>				
12	2.6% (0.52)	4.2% (0.81)	8.9%* (1.81)	11.2%** (2.15)
24	15.8% (1.27)	26.1%* (2.04)	59.5%*** (3.37)	58.4%*** (3.58)
36	22.8%* (1.72)	28.2%* (2.03)	32.7%*** (3.08)	34.3%*** (3.11)
<i>Panel B: VC-Backed</i>				
12	9.1% (0.61)	11.8% (0.78)	1.5% (0.10)	3.7% (0.24)
24	-14.3% (0.79)	0.4% (0.02)	-15.5% (-1.04)	-2.9% (-0.19)
36	8.6% (0.35)	16.7% (0.67)	15.5% (0.69)	23.2% (1.02)
<i>Panel C: Non-Backed</i>				
12	9.5%* (1.83)	11.0%* (2.09)	-7.4%* (-1.95)	-13.1%*** (-3.64)
24	-2.5% (-0.36)	5.4% (0.82)	-19.2%*** (-4.28)	18.9%*** (2.87)
36	-12.8%* (-1.89)	-8.7% (-1.27)	-26.0%*** (-6.64)	22.5%*** (3.65)

Note: significance *p < 0.1, ** p < 0.05, *** p < 0.01

To increase the robustness of our results, we employ a winsorization technique at the 5% level for the data presented in Table X. Upon examination of the outcomes in Table XI; it becomes evident that the returns exhibit some improvement. However, the overarching conclusion remains consistent for both benchmarks. Notably, NB and VC-backed firms continue to display more pronounced negative returns in the initial 12 months. Despite this, VC-backed firms still demonstrate non-significant long-term performance relative to the benchmark. This approach

adds an extra layer of validity to our findings, reinforcing the stability of our conclusions even under variations in the data.

Table XI

5% Winsorized buy-and-hold abnormal returns

Months	Value Weighted	
	OMXS	OMXS30
<i>Panel A: PE-Backed</i>		
12	9.5% ** (2.17)	11.0% ** (2.30)
24	41.1% *** (3.22)	56.4% *** (3.48)
36	48.4% *** (4.56)	31.8% *** (2.98)
<i>Panel B: VC-Backed</i>		
12	-6.9% (-0.68)	-4.9% (-0.47)
24	-16.2% (-1.33)	-3.7% (-0.26)
36	12.7% (0.25)	23.0% (1.03)
<i>Panel C: Non-Backed</i>		
12	-7.8% ** (-2.03)	-13.2% *** (-3.78)
24	-19.5% *** (-4.24)	18.4% *** (5.11)
36	-15.3% (-1.22)	22.1% *** (5.23)

Note: significance *p < 0.1, ** p < 0.05, *** p < 0.01

8.2.2 Multivariate analysis

Table XII displays multivariate regression results that examine the aftermarket performance of IPOs across the three groups. The results are segregated into two timeframes: 2-year and 3-year after the IPO.

Columns (1) and (2) present the results for the entire sample of IPOs. For the 2-year wealth relative, both the price-to-book value and leverage variables exhibit negative and significant coefficients, suggesting a potential decrease in long-term performance associated with higher initial valuations and debt ratios. The logarithm of market capitalization has a negative coefficient, implying that larger companies tend to underperform their smaller-sized counterparts over time, which may reflect that high initial valuations are negatively correlated with long-term performance. These findings are however in contrast to Levis (2011) who finds a positive correlation between size and wealth relative. Brav and Gompers (1997) acknowledge that companies with high price-to-book value or low book-to-market value show a pattern of underperformance. However, contrary to our findings, they posit that smaller firms underperform due to unexpected shocks, investor sentiment and asymmetric information. For the 3-year wealth relative, only the leverage variable shows a significant and negative coefficient. The PE and VC dummy variables consistently demonstrate significant and positive coefficients, indicating a positive effect of PE and VC sponsorship on long-term aftermarket performance.

Over a 24-month horizon, the PE dummy has a higher coefficient than the VC dummy, suggesting that all else equal, PE-backed companies achieve higher buy-and-hold returns on average. Over a 36-month horizon, the VC dummy exhibits a slightly higher coefficient (0.106) than the PE dummy (0.097). These results align with the findings from previous Winsorized buy-and-hold abnormal returns data. However, these findings only partially agree with those of Levis (2011), which suggest that while both PE- and VC-backed companies outperform non-backed companies, PE-backed companies are the top-performing group regarding 36-month aftermarket performance. Nevertheless, the differences in findings from year two to year three could potentially be due to the relatively small sample size for PE and VC. Our findings are at odds with the observations of Chen and Liang (2016), who found that VC-backed firms often need to catch up in performance after their public debut.

Comparing PE-backed (columns 3 and 4), VC-backed (columns 5 and 6), and non-backed (columns 7 and 8) groups, we observe varied outcomes for different variables. The non-backed group shows a negative and significant coefficient for leverage, suggesting that the market views high leverage unfavorably for these companies. In contrast, leverage has positive but insignificant coefficients for PE-backed and VC-backed groups, indicating a more positive or neutral perception of leverage when external financing from PE and VC sponsors is present. Additionally, this aligns with Ivashina and Kovner (2011)'s view that private equity firms benefit from robust bank relationships to secure loans with favorable terms, which may not adversely affect their holding companies' market performance the same way it does for companies without such backing. The market likely views leverage in PE and VC-backed firms as a strategy for growth rather than a financial risk, hence the positive or neutral reaction seen in the coefficients.

Regarding asset turnover, there is a negative correlation with 36-month post-IPO performance for PE-backed companies. In contrast, non-backed companies show a positive correlation, implying that the market rewards efficient use of assets differently depending on the company's backing.

In terms of market capitalization, there is a trend of long-term underperformance for larger firms in both PE-backed and non-backed groups, yet this trend only holds for VC-backed companies. First-day return consistently displays negative coefficients in relation to long-term performance across the three groups, aligning with the idea that the initial prices companies settle on after the first day of trading are often not maintained and tend to adjust downwards over time. However, it is important to note that these coefficients are not significant.

Table XII*Multivariate regression analysis: 24- and 36-Months Post-IPO Performance Across the Three Groups*

	All		PE		VC		NB	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	2y WR	3y WR	2y WR	3y WR	2y WR	3y WR	2y WR	3y WR
First-day return	-0.053 (-1.58)	-0.058 (-1.25)	-0.094 (-0.92)	-0.113 (-0.94)	-0.049 (-0.38)	-0.052 (-0.41)	-0.054 (-1.37)	-0.077 (-1.28)
Price-to-Book Value	-0.010* (-1.66)	-0.007 (-0.87)	-0.005 (-0.63)	0.005 (0.55)	-0.013 (-1.03)	-0.010 (-0.78)	-0.012 (-1.39)	-0.010 (-0.94)
Leverage	-0.029* (-1.85)	-0.068* (-1.68)	0.281 (1.24)	0.279 (1.08)	0.157 (1.11)	0.071 (0.42)	-0.056** (-2.28)	-0.095** (-2.02)
Asset turnover	0.006 (0.40)	0.042 (1.34)	-0.071 (-1.39)	-0.087* (-1.73)	-0.003 (-0.13)	0.007 (0.09)	0.039 (1.25)	0.069* (1.80)
Market Cap (LOG)	-0.032*** (-3.305)	-0.010 (-0.69)	-0.060** (-2.63)	-0.049* (-1.79)	0.021 (1.00)	0.020 (0.92)	-0.036*** (-2.94)	-0.010 (-0.51)
PE	0.111*** (2.71)	0.097* (1.66)						
VC	0.076* (1.79)	0.106* (1.95)						
Intercept	0.353*** (-5.43)	0.232*** (-2.20)	0.653*** (3.20)	0.600** (2.42)	0.148 (1.34)	0.177 (1.64)	0.376*** (4.67)	0.232* (1.82)
<i>R</i> ²	0.045	0.020	0.134	0.139	0.081	0.029	0.039	0.017
<i>No. Obs.</i>	368	277	71	53	42	38	243	186

Note: significance *p < 0.1, ** p < 0.05, *** p < 0.01

9.0 Conclusion, Limitations and Further Research

9.1 Conclusion

Our study delves into the underpricing and long-run performance of Swedish companies backed by PE, VC and those without such backing from 2011 to 2021. In this paper, we found that PE-backed IPOs are, on average, larger in size and amount raised. Furthermore, PE-backed firms exhibit better operational performance regarding asset turnover and profit margins and tend to be more leveraged. These firms are spread out across sectors, similar to non-backed firms, signaling that PE firms have a more generalist approach than VC firms. Additionally, we noted that, in general, the degree of underpricing has declined across the three groups.

This study yields several conclusions. Firstly, there is significant underpricing post-IPO for PE-backed, VC-backed firms, and non-backed firms, with PE-backed firms being the least underpriced in line with previous literature such as Mogilevsky and Murgulov (2012) and Berström et al. (2006). We did not find evidence suggesting differences in the levels of underpricing between PE, VC and NB on an equally weighted basis. However, on a value-weighted basis, we find that VC is more underpriced than PE and NB, aligning with previous research indicating that smaller companies tend to be more underpriced. Controlling for IPO and firm characteristics, we can also conclude that PE-backed firms exhibit less underpricing.

Moreover, we uncover compelling results by employing an ordinary least squares regression and controlling for operational and financial characteristics. Specifically, the coefficient of -0.151 for BHAR indicates that PE-backed firms are associated with a significant reduction in underpricing. This aligns with the expectation that PE-backed firms, with their inherent characteristics such as closer monitoring and reduced information asymmetry, experience less underpricing. Contrary to earlier findings, our analysis reveals an unexpected positive correlation between market capitalization and underpricing, suggesting that larger firms, often perceived as more stable and less risky, might experience higher levels of underpricing.

In terms of long-term performance, observing 36 months and using the OMXS and the OMX 30 as benchmarks, we find PE-backed companies have yielded significantly BHAR than their counterpart for 24 months and 36 months. In contrast, NB firms highlight significant negative returns during the same period, while we do not find any significant results for VC firms.

Furthermore, investigating 36-BHAR per cohort based on year, we find that PE-backed firms exhibit sustained overperformance compared to the benchmark in all years except 2020. In contrast, VC-backed and NB firms show fluctuations in BHAR over the years, with noticeable poor performance from 2018 to 2020.

Finally, applying a multivariate regression, we find that both PE and VC firms show significant outperformance when measured on a wealth-relative basis compared to NB firms. VC-backed and PE-backed firms exhibit similar performance over the long haul, with the main difference being that relatively few firms account for the high returns in the VC-backed group. In addition, we also observe that PE-backed performance is negatively correlated with size and asset turnover.

9.2 Limitations

To begin, we must point out that there is no single, agreed-upon way to classify PE and VC firms, as discussed in the previous chapters. Researchers define these groups in various ways, complicating studies like ours. In our study, we align the classification methodology with that of Mogilevsky and Murgulov (2012) and Bergström et al. (2006), which is based on a database classification system. On the other hand, Levis (2011) uses a different criterion, utilizing ownership percentage for classification. This decision on how to classify can introduce potential biases and affect the comparability of our results with those of previous research.

Apart from the classification concerns, it is also vital to acknowledge the potential limitations of the relatively small sample size. Our focus on examining the performance of listed companies in Sweden, particularly those backed by private equity firms, inherently limits the breadth of our sample. This specificity, coupled with the significant number of IPOs in Sweden during 2021 and the missing 36-month post-IPO performance data for these entries, restricts our sample size even more and may influence the strength of our findings.

Finally we do not take into account underwriter as well as the PE and VC firms reputation as applying these measures would entail a lot of subjectivity which would reduce our comparability with other studies.

9.3 Further research

While the findings in this thesis broadly align with prior literature, it is essential to note that we have not fully explored the impact of operating performance and the different strategies applied by PE and VC firms. A deep dive into the investment and operational strategies these sponsors employ would enrich this study area. Such an investigation would offer a more nuanced understanding of how sponsor strategies influence the holding firm, thereby impacting underpricing dynamics. Furthermore, examining the effects of PE and VC companies' degree of involvement and ownership stake post-IPO, along with potential strategies they implement, could shed light on long-term abnormal returns. Finally, exploring the performance in other countries is of interest.

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Appendix

Table 1 VIF

Variance Inflation Factors	
Private Equity	1.735
Venture Capital	1.122
Stock Exchange	1.199
Age	1.054
Market Capitalization (LOG)	1.864
Asset Turnover	1.094
Leverage	1.432
Industrials	1.492
Consumer Discretionary	1.388
Communication Services	1.265
Information Technology	1.391
Financials	1.266
Utilities	1.047
Consumer Staples	1.140
Real Estate	1.558
Materials	1.106
Energy	1.036

Table 2 Data set

Company Name	IPO date	Company Name	IPO date
2cureX AB	2017-11-23	Awardit AB	2017-12-04
AAC Clyde Space AB	2016-12-20	Ayima Group AB	2017-05-09
Abera Bioscience AB	2021-02-24	Bactiguard Holding AB	2014-06-19
Absolent Air Care Group AB	2014-09-30	Balco Group AB	2017-10-05
Absolicon Solar Collector AB	2016-03-29	Bambuser AB	2017-04-27
AcadeMedia AB	2016-06-15	Besqab AB	2014-06-12
Acarix AB	2016-12-08	Better Collective A/S	2018-06-08
Acast AB	2021-06-17	BHG Group AB	2018-03-27
Acconeer AB	2017-12-10	BiBBInstruments AB	2017-10-26
AcouSort AB	2017-01-08	BICO Group AB	2016-11-02
ACQ Bure AB	2021-03-25	BioArctic AB	2017-10-11
Actic Group AB	2017-04-07	Biofrigas Sweden AB	2020-06-15
AcuCort AB	2017-04-23	Bioservo Technologies AB	2017-05-21
Adtraction Group AB	2021-12-06	Biovica International AB	2017-03-17
Advanced Soltech Sweden AB	2021-10-27	Bio-Works Technologies AB	2017-12-01
Advenica AB	2014-09-11	Blick Global Group AB	2014-06-24
Adverty AB	2018-10-19	Bodyflight Sweden AB	2018-05-02
Aerowash AB	2016-12-07	Bonesupport Holding AB	2017-06-21
Agtira AB	2017-06-27	Bonzun AB	2014-10-01
Ahlsell	2016-10-28	Boozt AB	2017-05-31
Aino Health AB	2016-12-09	Boule Diagnostics AB	2011-06-17
Alelion Energy Systems AB	2016-06-20	BPC Instruments AB	2021-12-16
Aligro Planet Acquisition Company AB	2021-05-25	BrainCool AB	2014-04-14
Alimak Group AB	2015-06-16	Bravida Holding AB	2015-10-15
Alligator Bioscience AB	2016-11-23	Brilliant Future AB	2021-06-23
Alltainer AB	2020-12-11	Bufab AB	2014-02-21
Alpcot Holding AB	2021-11-10	BuildData Group AB	2018-03-06
Alteco Medical AB	2014-03-11	Bulten AB	2011-05-20
AlzeCure Pharma AB	2018-11-27	BYGGFAKTA GROUP Nordic HoldCo AB	2021-10-15
Ambea AB	2017-03-31	Bygghemma	2018-03-27
Annexin Pharmaceuticals AB	2017-03-28	Byggmästare Anders J Ahlström Holding AB	2014-12-12
AppSpotr AB	2016-12-18	ByggPartner Gruppen AB	2016-12-01
Aquaticus Real Estate AB	2021-07-09	CAG Group AB	2018-12-11
Arcoma AB	2014-11-13	Calliditas Therapeutics AB	2018-06-29
Arla Plast AB	2021-05-25	Camurus AB	2015-12-03
Arlandastad Group AB	2021-09-15	Candles Scandinavia AB	2021-11-08
AroCell AB	2011-04-14	Capio	2015-06-17
Asarina Pharma AB	2018-09-20	Carbiotix AB	2019-10-17
Ascelia Pharma AB	2019-03-06	Cary Group	2021-09-23
Attendo AB	2015-11-29	Case Group AB	2021-12-16
Aventura Group AB	2021-06-14	Catena Media plc	2016-02-11
AVTECH Sweden AB	2011-11-28	Cedergrenska AB	2021-05-25

Company Name	IPO date	Company Name	IPO date
ChargePanel AB	2021-12-01	Embellence Group AB	2021-03-24
Christian Berner Tech Trade AB	2014-10-19	Embracer Group AB	2016-11-21
ChromoGenics AB	2017-03-03	Enad Global 7 AB	2017-12-12
Cibus Nordic Real Estate AB	2018-03-08	Enersize Oyj	2017-06-14
Cint Group AB	2021-02-19	Enorama Pharma AB	2016-05-11
CirChem AB	2020-12-04	Envirologic AB	2014-03-21
Clean Industry Solutions Holding Europe AB	2018-12-04	EQT AB	2019-09-23
Clean Motion AB	2016-05-04	ES Energy Save Holding AB	2020-09-21
Clemondo Group AB	2013-12-11	Evolution AB	2015-03-20
Climeon AB	2017-10-12	ExpreS2ion Biotech Holding AB	2016-06-29
Cline Scientific AB	2015-03-29	Exsitec Holding AB	2020-09-16
CLX Communications	2015-10-08	Eyeonid Group AB	2016-09-20
CodeMill AB	2021-06-18	Fantasma Games AB	2021-03-22
CoinShares International Limited	2021-03-04	Fasadgruppen Group AB	2020-12-09
Colabitoil Sweden AB	2017-11-21	Fastout Int. AB	2015-12-15
Com Hem	2014-06-17	Ferronordic AB	2017-10-26
Comintelli AB	2018-11-18	Finepart Sweden AB	2016-11-30
Compodium International AB	2021-11-09	First Venture Sweden AB	2021-07-02
Coor Service Management Holding AB	2015-06-16	Flat Capital AB	2021-10-19
Corline Biomedical AB	2015-04-28	FlexQube AB	2017-12-13
Creaspac AB	2021-06-23	Flowscape Technology AB	2016-06-30
CTEK AB	2021-09-24	Fluicell AB	2018-04-17
DDM Holding AG	2014-07-31	FM Mattsson Mora Group AB	2017-04-10
Desenio Group AB	2021-02-25	Fortinova Fastigheter AB	2020-11-19
DevPort AB	2017-12-04	Fractal Gaming Group AB	2021-02-11
Devyser Diagnostics AB	2021-12-03	Fragbite Group AB	2021-07-07
Dextech Medical AB	2014-05-22	Fram Skandinavien AB	2017-10-11
Diagonal Bio AB	2021-07-13	Freja eID Group AB	2014-12-17
Dicot AB	2018-05-28	Front Ventures AB	2016-02-15
Dlaboratory Sweden AB	2021-04-21	FX International AB	2011-03-22
Dometic Group AB	2015-11-25	Gabather AB	2014-10-03
Double Bond Pharmaceutical International AB	2015-07-02	Garo Aktiebolag	2016-03-15
Duearity AB	2021-05-11	Gasporox AB	2016-10-24
Dustin Group AB	2015-02-12	Godsinlösen Nordic AB	2021-06-30
EatGood Sweden AB	2017-03-01	Gold Town Games AB	2016-06-03
eBlitz Group AB	2019-09-24	Gomero Group AB	2018-05-25
Edgeware	2016-09-12	GomSpace Group AB	2016-06-07
eEducation Albert AB	2021-10-01	Goobit Group AB	2021-05-05
Eevia Health Oyj	2021-06-29	Gränges AB	2014-10-10
Ekobot AB	2021-03-15	Green Landscaping Group AB	2018-03-23
Ellwee AB	2021-01-19	Gullberg & Jansson AB	2012-06-18
Eltel AB	2015-02-06	Handicare Group	2017-10-10

Company Name	IPO date	Company Name	IPO date
Hanza AB	2014-06-12	Kontigo Care AB	2015-06-04
Haypp Group AB	2021-10-13	Kvix AB	2021-11-29
Heimstaden AB	2015-06-01	LIDDS AB	2014-07-29
Heliospectra AB	2014-06-16	Lifco AB	2014-11-21
Hemcheck Sweden AB	2017-03-13	LifeClean International AB	2020-10-01
Hemnet Group AB	2021-04-26	Lime Technologies AB	2018-12-05
Hexicon AB	2021-06-18	Linc AB	2021-05-27
Hitech & Development Wireless Sweden Holding AB	2017-12-13	Linkfire A/S	2021-06-28
Humana AB	2016-03-22	Lipidor AB	2019-09-16
Humble Group AB	2014-11-11	Lipigon Pharmaceuticals AB	2021-03-01
Hybricon AB	2015-06-09	LMK Group AB	2021-03-29
Iconovo AB	2018-03-26	Lohilo Foods Ab	2020-10-25
Idun Industrier AB	2021-03-25	Luxbright AB	2020-11-19
Immunovia AB	2015-11-26	Lyko Group AB	2017-12-12
Implantica AG	2020-09-21	M.O.B.A. Network AB	2019-12-11
InCoax Networks AB	2019-01-02	Mackmyra Svensk Whisky AB	2011-11-23
InDex Pharmaceuticals Holding AB	2016-09-30	MAG Interactive AB	2017-12-07
Infrea AB	2018-04-19	Magle Chemoswed Holding AB	2020-06-30
Inhalation Sciences Sweden AB	2017-09-15	Mantex AB	2017-03-29
Inission AB	2015-06-04	Maven Wireless Sweden AB	2021-05-27
Insplorion AB	2015-05-27	Maximum Entertainment AB	2018-11-19
Instalco AB	2017-05-11	Medhelp Care Aktiebolag	2021-10-25
Integrum AB	2017-05-14	Medicover AB	2017-05-23
Internationella Engelska Skolan i Sverige Holding	2016-09-29	Mendus AB	2013-03-26
Invent Medic Sweden AB	2016-02-28	Mentice AB	2019-06-17
Inwido AB	2014-09-26	Mestro AB	2021-12-14
Irisity AB	2013-10-22	Metacon AB	2018-08-31
IRLAB Therapeutics AB	2017-02-14	MilDef Group AB	2021-06-04
Isofol Medical AB	2017-04-04	Minesto AB	2015-10-28
I-Tech AB	2018-05-23	Mips AB	2017-03-23
iZafe Group AB	2011-04-03	Moberg Pharma AB	2011-05-20
Jetpak Top Holding AB	2018-12-04	Motion Display Scandinavia AB	2014-04-15
John Mattson Fastighetsföretagen AB	2019-06-04	MoveByBike Europe AB	2021-06-16
JonDeTech Sensors AB	2018-05-16	Munters Group AB	2017-05-19
Jumpgate AB	2016-06-28	Nanexa AB	2015-06-08
Karnov Group AB	2019-04-11	NCAB Group AB	2018-06-05
Karolinska Development AB	2011-04-15	NeoDynamics AB	2018-11-19
Kentima Holding AB	2013-05-31	Nepa AB	2016-04-25
K-Fast Holding AB	2019-11-28	Netel Holding AB	2021-10-15
Kjell Group AB	2021-09-15	New Bubbleroom Sweden AB	2021-11-23
KlaraBo Sverige AB	2021-12-02	News55 AB	2017-06-26
Kollect on Demand Holding AB	2019-12-13	Ngenic AB	2021-06-08

Company Name	IPO date	Company Name	IPO date
Nilsson Special Vehicles AB	2015-12-10	PolarCool AB	2018-11-02
Nimbus Group AB	2021-02-09	PowerCell Sweden AB	2014-12-12
Nitro Games Oyj	2017-06-15	Prebona AB	2015-12-11
Nivika Fastigheter AB	2021-12-03	Premium Snacks Nordic AB	2014-11-30
Nobina	2015-06-18	Profoto Holding AB	2021-07-01
Nordax	2015-06-17	Projektengagemang Sweden AB	2018-06-19
Nordic Asia Investment Group 1987 AB	2021-12-16	Provide IT Sweden AB	2016-06-26
Nordic Paper Holding AB	2020-10-22	Qbrick AB	2021-06-16
Nordic Waterproofing Holding AB	2016-06-10	Qiiwi Games AB	2017-10-12
Nordisk Bergteknik AB	2021-10-12	QleanAir AB	2019-12-12
Norditek Group AB	2021-11-09	Q-linea AB	2018-12-06
Nordnet AB	2020-11-25	Qlucore Ab	2021-11-04
Northern CapSek Ventures AB	2020-07-07	Raketeck Group Holding PLC	2018-06-28
Norva24 Group AB	2021-12-09	Ranplan Group AB	2018-06-12
Nosium AB	2017-12-27	Readly International AB	2020-09-17
NP3 Fastigheter AB	2014-12-03	Realfiction Holding AB	2017-05-30
ODI Pharma AB	2020-01-03	Recyctec Holding AB	2012-12-04
Odinwell AB	2021-06-03	Redwood Pharma AB	2016-06-14
OmniCar Holding AB	2017-06-22	Resurs Holding AB	2016-04-29
Oncopeptides AB	2017-02-21	RLS Global AB	2012-04-11
Opter AB	2021-11-22	Rugvista Group AB	2021-03-18
OptiCept Technologies AB	2014-06-18	RVRC Holding AB	2021-06-16
OrganoClick AB	2015-02-10	S2Medical AB	2018-11-19
Ortoma AB	2014-03-03	Safello Group AB	2021-05-04
OssDsign AB	2019-05-22	Safeture AB	2014-10-14
Ovzon AB	2018-05-17	Samtrygg Group AB	2017-03-14
OX2 AB	2021-06-23	Saniona AB	2014-03-20
OXE Marine AB	2017-06-26	SaveLend Group AB	2021-06-07
Padox AB	2015-06-18	Scandi Standard AB	2014-06-27
Paradox Interactive AB	2016-05-26	Scandic Hotels Group AB	2015-12-01
Paxman AB	2017-05-29	ScandiDos AB	2014-03-27
PEPTONIC medical AB	2014-07-01	Scandinavian ChemoTech AB	2016-11-22
Permascand Top Holding AB	2021-06-04	Scandinavian Real Heart AB	2014-10-30
PEXA AB	2015-10-06	SciBase Holding AB	2015-05-29
Pharmiva AB	2021-03-31	Seafire AB	2017-10-31
Photocat A/S	2015-10-23	Seamless Distribution Systems AB	2017-07-20
Physitrack PLC	2021-06-18	SeaTwirl AB	2016-12-21
Pierce Group AB	2021-03-26	SECITS Holding AB	2017-03-30
Pila Pharma AB	2021-07-12	Sedana Medical AB	2017-06-20
Platzer Fastigheter Holding AB	2013-11-29	Sensor Alarm Norden AB	2021-04-07
Plejd AB	2016-03-15	SenzaGen AB	2017-09-14
Plexian AB	2021-04-14	Shortcut Media AB	2016-06-19

Company Name	IPO date	Company Name	IPO date
Simris Group AB	2016-04-13	Urb-it AB	2017-07-06
Sinch AB	2015-10-07	Uswe Sports AB	2021-06-15
Sjöstrand Coffee Int AB	2016-02-16	Vadsbo SwitchTech Group AB	2016-04-18
Sleep Cycle AB	2021-06-08	Vaxxa AB	2017-07-14
Smart Eye AB	2016-12-06	Veg of Lund AB	2020-02-09
Smart Wires Technology Ltd.	2021-05-12	Vertiseit AB	2019-05-27
SÖDer Sportfiske Ab	2021-09-09	Vibrosense Dynamics AB	2015-04-07
Solidx AB	2021-11-03	Vicore Pharma Holding AB	2015-12-09
SolTech Energy Sweden AB	2015-06-04	Vimian Group AB	2021-06-18
Sonetel AB	2017-02-28	Viva Wine Group AB	2021-12-14
SOZAP AB	2021-06-01	Volvo Car AB	2021-10-28
Spago Nanomedical AB	2012-12-26	W5 Solutions AB	2021-12-17
SpectraCure AB	2015-06-12	Wästbygg Gruppen AB	2020-10-11
Spotlight Group AB	2020-09-15	Wicket Gaming AB	2021-07-22
Sprint Bioscience AB	2014-10-31	WilLak AB	2016-09-21
Stayble Therapeutics AB	2020-03-09	Wilson Therapeutics	2016-05-12
Stenhus Fastigheter i Norden AB	2020-11-24	Xbrane Biopharma AB	2016-02-02
Storskogen Group AB	2021-10-06	Xintela AB	2016-02-22
Sun4Energy Group AB	2021-11-26	XMReality AB	2017-04-10
Surgical Science Sweden AB	2017-06-13	Xspray Pharma AB	2017-09-13
Swedencare AB	2016-06-13	Zenergy AB	2015-11-13
Synsam AB	2021-10-28	ZignSec AB	2019-10-20
TalkPool AG	2016-05-19	Zoomability Int AB	2019-07-16
Tangiamo Touch Technology AB	2017-03-24		
Tebede AB	2021-06-24		
Tempest Security AB	2017-12-05		
Teqnion AB	2019-04-03		
TF Bank AB	2016-06-13		
Thinc Collective AB	2018-11-11		
Thule Group AB	2014-11-26		
Thunderful Group AB	2020-12-07		
Titania Holding AB	2021-12-10		
Tobii AB	2015-04-23		
Train Alliance Sweden AB	2020-02-19		
Trainimal AB	2021-04-16		
Transfer Group AB	2021-08-30		
Transtema Group AB	2015-05-06		
Triboron International AB	2019-04-07		
Truecaller AB	2021-10-08		
Tura Group AB	2021-12-27		
Unibap AB	2017-03-26		
Upsales Technology AB	2019-04-23		