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Private Equity (De)Listings in Scandinavia

A descriptive and empirical study of private equity and venture capital firms listing and delisting activity in Scandinavia

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Abstract

Shrinking stock markets are a phenomenon witnessed across the world. Given stock markets importance to the economy, this trend is worrying. A number of studies have identified private equity as a catalyst for these shrinking markets. We ask how this plays out in Scandinavia. To date, the influence of private equity on the Scandinavian stock markets is unexplored. Hence, this thesis offers two contributions. First, we map out private equity's net contribution to listings and delistings on the Scandinavian stock exchanges. We rule out that private equity is contributing to a shrinking stock market. Second, we investigate how fundraising drives private equity-backed listings and delistings in Scandinavia. Our results indicate that higher fundraising is associated with increased private equity-backed stock listings three years after the fundraising. Further, our results suggest that higher fundraising is associated with increased private equity-backed public-to-private delistings one year later.

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1. Introduction

In recent decades, there has been a substantial decrease in publicly listed companies across international stock markets. From its peak in 1997, the number of firms listed on U.S. stock markets was halved by 2015 (Ljungqvist, Persson and Tåg, 2016). Similarly, the number of firms listed on the main U.K. stock market dropped by 57% between 1996 and 2016 (Steers, 2017).

Challenges related to a shrinking stock market span several dimensions. An important function of the stock market is facilitating efficient price discovery, something that Hayek brought attention to as crucial for effective resource allocation as early as 1945 (Hayek, 1945). Hence, shrinking stock markets can cause ripple effects for the entire economy. More recent literature suggests that shrinking stock markets can lead to detrimental effects on price discovery, business-friendly policies, and solving the climate crisis (Alan and Schwartz, 2013; Ljungqvist et al., 2016; Cleary et al., 2017).

Several papers have accused private equity (PE) firms of being a major catalyst for shrinking stock markets due to their buyout activities (Ulrich and Allen, 2016; Ljungqvist et. al., 2016). However, such research has been conducted almost exclusively on the U.S. market. It is therefore not evident how PE firms affects the Scandinavian stock markets. Consequently, our thesis delves deeply into the activities of PE and venture capital (VC) in the Scandinavian stock markets. The thesis seeks to answer the following two questions:

i) Do PE and VC firms contribute to shrinking stock markets in Scandinavia?
ii) How does fundraising drive PE- and VC-backed listings and delistings in Scandinavia?

By deploying a descriptive approach, we map out the total contribution of PE and VC to listings and delistings in Scandinavia from 2006 to 2020. We demonstrate contributions from PE and VC in terms of number of companies and market capitalization. Further, we conduct an empirical analysis to identify how fundraising drives PE- and VC-backed (de)listings by running ordinary least squares (OLS) regressions with year fixed effects.

Shrinking stock markets can be caused by two factors. The first factor is delistings, where Ljungqvist et al. demonstrate that PE is behind a sizable number of delistings in the U.S., calling it “the unintended dark side of private equity.” The second factor is listings. Doidge,

Karolyi, and Stulz (2015) attribute 54% of what they refer to as "the listing gap" in the U.S. to a low number of new listings. In addition, there has been a decrease in the number of PE-backed listings since 1970 (Kaplan and Strømberg, 2009). In order to obtain a complete picture of how PE and VC funds affect the Scandinavian stock markets, this thesis covers both listings and delistings.

To study the activities of PE and VC in the Scandinavian stock markets, we construct a dataset consisting of ownership information and market capitalization of all new listed and delisted companies in Scandinavia from 2006 to 2020. This represents 918 listings and delistings on the three main stock lists and 1,484 (de)listings on all stock lists. To answer our first question – *Do PE and VC contribute to shrinking stock markets in Scandinavia?* – we are summarizing the number of all new listed and delisted companies and their corresponding market value per year. We find that PE and VC are contributing to substantially more listings than delistings, both in terms of number of companies and market value. Therefore, we rule out that PE and VC contribute to shrinking stock markets in Scandinavia. Moreover, we investigate which countries and industries that experience the highest PE and VC activity. We find that Sweden is the country with the highest PE and VC activity, while "industry and manufacturing" is the most prominent industry for PE and VC listings. At the same time, "IT and technology" emerge as the industry that attracts the most PE delistings.

Fundraising is an essential activity for all PE and VC firms, enabling them to conduct investments. In turn, fundraising should relate to the number of PE- and VC-backed buyouts and exits. Literature suggests that even though there has been a decline in PE exits through the stock markets, a reasonable proportion of PE- and VC-backed investments are still exited through stock listings (Kaplan and Strømberg, 2009; Gompers, Kaplan, and Mukharlyamov, 2015). At the same time, the proportion of investments exited though the stock exchange is higher for larger PE firms (Gompers et al., 2015). Further, it has been demonstrated that PE firms are subject to pressure from limited partners (LPs) to deploy their capital shortly after high fundraising (McKinsey & Company, 2018).

To study our second question – *How does fundraising drive PE- and VC-backed listings and delistings in Scandinavia?* – we study the main lists on the stock exchanges exclusively. Fundraising data includes yearly committed capital to PE and VC funds headquartered in Scandinavia. We run multiple OLS regressions with year fixed effects to analyse how fundraising drives PE- and VC- backed (de)listings, while controlling for market conditions.

We formulate the following hypothesis regarding listings: *There is a positive relationship between fundraising and PE- and VC- backed listings.* We identify a positive relationship between fundraising and PE- and VC-backed listings three, four and five years after fundraising. However, the relationship is only significant for a three-year lag. In examining the effect of fundraising on PE-backed delistings, we formulated a second hypothesis: *There is a positive relationship between fundraising and PE-backed delistings shortly after fundraising.* Our results suggest that an increase in fundraising is associated with an increase in delistings one and two years later. That said, the relationship is significant for a one-year lag, but not for a two-year lag.

The thesis is structured as follows. First, we examine the literature related to our two research questions. We aim to demonstrate how broadly the effects of a shrinking stock market reach. This is followed by a presentation of the hypotheses and an outline of the data and methodology. Finally, we present our findings and a discussion before concluding.

2. Literature review

This chapter highlights relevant literature regarding the issues of shrinking stock markets, the importance of well-functioning stock markets and briefly introduces the PE model.

2.1 The stock exchange – A short introduction

A stock exchange is a regulated marketplace where a company's shares are listed and open for trading. In practice, tiny fractions of a company's ownership can be bought and sold. A stock exchange works as a secondary marketplace, which means that investors are trading with other investors and not directly with the listed company. Once a company gets listed on a stock exchange, it must follow specific regulations, like annual or quarterly reporting and announcement of relevant events (Finanstilsynet, 2018). In addition, several other instruments are traded on a stock exchange, such as derivatives, bonds, and exchange-traded funds (CFI, 2022). From 1975 to 2015, the number of countries with a stock exchange grew from just above 50 to over 160 (Cleary et al., 2017).

2.2 The delisting gap

Ljungqvist, Persson and Tåg (2016) researched the consequences of what they call "excessive delistings." From 1997 to 2015, there was a substantial reduction in the number of listed firms on the U.S. stock market. The number of listed firms was approximately halved, from 7,428 to 3,754. Doidge, Karolyi and Stulz (2016) argued that a historically high number of delistings can explain 46% of this reduction. Ljungqvist et al. framed their analysis in light of PE. When a PE firm acquires a public firm, it will take that firm private in a public-to-private transaction. The acquired company will therefore be delisted from the respective stock exchange. PE firms are responsible for a sizeable number of delistings in the U.S. stock market (Ljungqvist et al., 2016).

With the use of a political economy model, Ljungqvist et al. demonstrated that private firms' and investors' incentives to delist are not always in line with the interests of society. It may be in a PE firm's best interest to take a company private to maximize its returns. Similarly, it may be in a private or institutional investor's best interest to sell their shares to a PE firm at the offered price. However, the issues occur when there is an excessive form of delisting. The correlation between listed companies and stock market participation in the U.S. has been as

high as 80.9% since 1946 (Ljungqvist et al., 2016). The population is consequently getting less exposed to corporate profits when the stock market is shrinking. In turn, less exposure to corporate profits gives people fewer incentives to care about business-friendly policies. Reduced interest in business-friendly policies can lead to negative externalities in the economy. More specifically, it can lead to reductions in productivity, investment and employment (Ljungqvist et al., 2016). Several studies have identified PE as contributing to value creation in terms of increased financial performance and operative efficiency. Nonetheless, Ljungqvist et al.'s research suggests that the strong PE growth since 1980 and the associated reduction in listed companies can outweigh the positive effects of PE. The authors call excessive delistings "the unintended dark side of private equity."

Although similar research has not been conducted in Europe, one can observe the same shrinking trend in the U.K. markets. According to Steers (2017), the main list on the U.K. stock market shrunk by 57% from 1996 to 2016.

2.3 The stock market as a pricing mechanism

Hayek (1945) used the word "planning" to describe the process of allocating available resources. He viewed an economy as a set of planners who use their knowledge to allocate resources. Hayek gave attention to the question of whether planning should be performed by one central authority or be divided among several individuals. Hayek argued that a single planner in possession of all data in a small economy would not be able to make correct adjustments between ends and means that are affected by the slightest adjustment in available resources. He further argued that a system where the knowledge is distributed among several individuals is more likely to utilize existing resources efficiently. That said, the problem of a decentralized system is, as Hayek articulated, that a "man on the spot" cannot decide solely based on his limited knowledge of his immediate surroundings. The solution was the price system, also referred to as the "economic calculus." A price system facilitated necessary knowledge so that participants in a decentralized system can execute their plans and efficiently utilize existing resources.

Hayek's arguments are relevant in discussing a shrinking stock market, where we can view companies as planners. First, when companies go private, they are no longer exposed to the public price systems, thus preventing them from absorbing information through their share price. Furthermore, for every company going private, the price system facilitated by an

exchange becomes less effective in capturing relevant information for other beneficiaries. Therefore, one could argue that public to private transactions has detrimental effects on both companies and beneficiaries of an exchange. In Hayek's view, the company would be run more efficiently, at least from a societal perspective, if exposed to the broader pricing system an exchange provides.

Alan and Schwartz (2013) advocated for the importance of an exchange-produced price. They emphasized that price discovery affects not only trading parties, but also several other groups of beneficiaries. An exchange-produced price is used for derivative pricing, marking to market, estate valuations, valuation of mutual fund cash flow and dark-pool pricing. In other words, exchange prices serve as a public good. Observing the price is free and serves many purposes that are essential for market participants.

The derivatives market is a good example of how an exchange-produced price can be used as a public good among market participants. Lien and Zhang (2008) summarized the empirical and theoretical research on the functions of derivatives markets. They found that financial derivative markets have helped support capital inflows into emerging economies. Derivatives offer alternatives to risk management as they provide the opportunity to spread risk among several parties, which in turn makes risky projects and investments more available for investors to exploit. In addition to risk control, derivatives also provide signals about the market's expectations in the form of implied volatility. For example, the volatility index (VIX) is a direct product of the U.S. derivatives market and expresses the expected 30-day volatility retrieved from put and call options on the S&P 500 index (CBOE, 2022). As examined by Yildirim (2021), the VIX index became significantly volatile during the period from 2007–2009 and the global financial crisis. If interpreted well, the implied volatility based on options can help investors adjust their portfolios based on the "fear" consensus that exists in the markets.

2.4 The stock exchange's role in fostering economic growth and sustainable development

Stock exchanges are not important merely in promoting a business-friendly environment and enabling effective price mechanisms. A joint report by the United Nations Conference on Trade and Development (UNCTAD) and the World Federation of Exchanges (WFE) highlighted how stock exchanges can also work as an essential tool to achieve the United Nations' sustainable development goals (SDGs). The SDGs pursue a broad set of focus areas, ranging from no

poverty to economic growth and climate action (UN, 2015). In order to reach these goals, the private sector will have an important role on top of what the public sector can offer. UNCTAD's 2014 World Investment Report forecasted that yearly investments of $5 to $7 trillion would be necessary to meet the SDGs (UNCTAD, 2014). Stock exchanges can play an important role in meeting these investment needs (Cleary et al., 2017).

In the UNCTAD and WFE report, the authors identified two key mechanisms through which stock exchanges can enable economic growth and sustainable development. The first is through mobilizing resources. A well-functioning stock exchange facilitates an effective allocation of capital by bringing together those who have capital with those in need of it in an environment that is transparent, regulated and secure (Cleary et al., 2017). Moreover, there has been a recent increased focus on markets for small and medium-sized enterprises (SMEs). Capital has flown into SMEs at a rapid pace, which is improving their access to financing and thus boosting their abilities to innovate and develop. Lastly, several stock exchanges offer sustainability-themed products, such as ESG indexes, green bonds and funds (Cleary et al., 2017).

The second key mechanism through which stock exchanges can enable economic growth and sustainable development is through promotion of good governance in businesses. Several stock exchanges encourage better environmental, social and governance (ESG) behavior, for example through listing regulations and guidance on ESG reporting. Furthermore, the advantages to SMEs extend further than their increased access to capital. Several stock exchanges also offer programs for different activities, such as management practices, improved corporate governance and innovation and growth (Cleary et al., 2017).

2.5 Firms' (dis)incentives to go public

While there are many reasons why a large and effective stock exchange is beneficial for the society and economy, the decision to go public ultimately lies with the firm. A firm will only choose to go public if it is beneficial for the firm and its owners.

The most important factor in the decision to go public for many companies is the increased access to capital markets. Most companies raise a sizeable amount of capital in relation to going public (Ritter and Welch, 2002). By being listed on a regulated market, a company will be able to reach out to a much larger pool of investors. In addition, they will have an effective market value, making follow-on offerings considerably easier (Pagano et al., 1998; Chen, 2022).

Moreover, listing on a stock exchange will increase the liquidity of a firm's shares. This will make the company more attractive to investors and could even provide the shares with a liquidity premium, earning a higher valuation (Pagano et al., 1998). The stock market also provides a good opportunity to exit investments. This opportunity is especially important for a PE or VC firm, which needs to exit its investments after some time.

However, there are also disadvantages of going public, which prevent many companies from being listed and sometimes create incentives to delist a company. The first major disadvantage is the cost of the IPO itself. Several advisory fees must be paid to investment bankers, lawyers and auditors. After the IPO, there will also be yearly recurring expenses to auditors for reporting and stock exchange fees (Mohr, 2019). Thus, even if a company has already gone public, it could be beneficial for it to be delisted if, for example, its earnings start to vanish or the liquidity in the stock is low (Pagano et al., 1998). Furthermore, once a company goes public, it will be exposed to shareholders with different preferences regarding management, financial structure, secondary financings and acquisitions. Therefore, a large number of new shareholders could lead to less control for the existing shareholders (Barden et al., 1984).

2.6 The private equity model

Private equity is an investment class composed of capital that is not publicly listed. This thesis focuses on PE funds. A PE fund is built by limited partners (LP) and general partners (GP). LPs are often institutional investors who commit capital to the fund. The LPs are consequently the main owners of the fund. The GPs manage the fund and earn profits through management and performance fees (Bienz, 2016). In addition to the capital committed by the LPs, the GPs are also typically required to invest in the fund. This system creates an alignment of interest between the LPs and the GPs. Moreover, it prevents the GPs from excessive risk-taking, as they also have skin in the game (Bienz, Thorin & Walz, 2016). Ultimately, the main goal of a PE fund is to earn the highest possible returns on their investments.

Figure 1: The private equity model

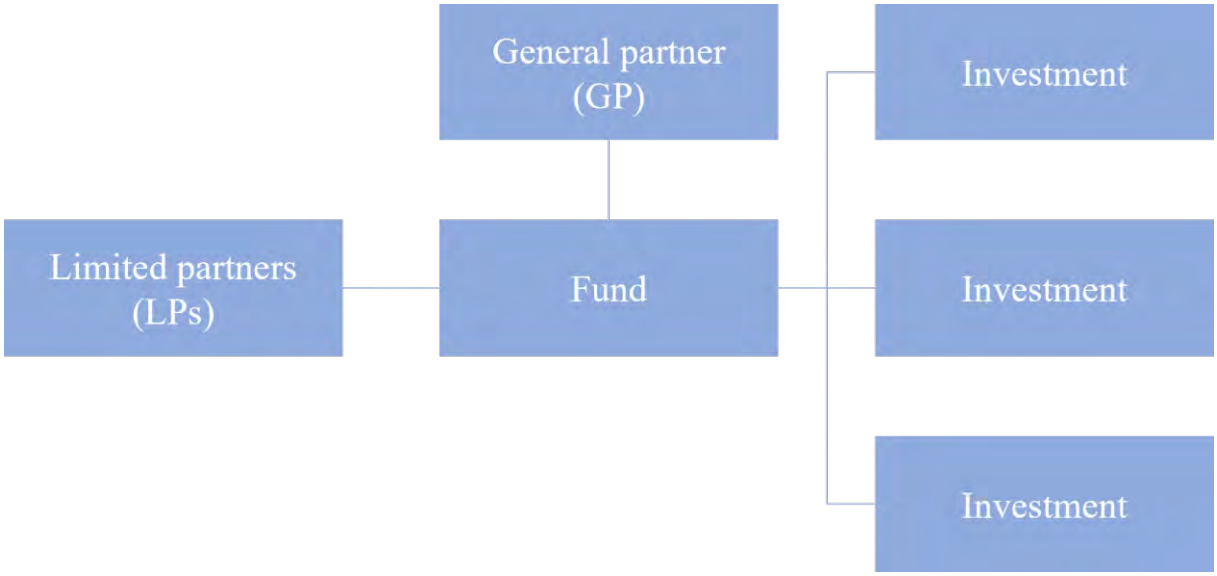

Figure 1 presents the structure of a private equity fund.

A PE firm generally employs an active approach to ownership. This means that the firm will normally acquire a controlling share of the company it invests in, work closely with the management and usually occupy one or more board seats. These actions make the distance from owners to management short, making it easy to align interests and strategy (Gilligan and Wright, 2014). Unlike both hedge funds and mutual funds, a PE fund as a rule invests in a private company or buys a public company to take it private. In addition, a PE fund also takes a higher stake in companies than other funds. VC is a form of PE and serves primarily as a source of financing for early-phase companies as startups. VC firms differ from PE firms in four main dimensions: i) the companies in which they invest are in the early phase, ii) the amount they invest is typically lower, iii) they enter with a lower share of capital, and iv) they enter with different timing in a company's life cycle (Pitchbook, 2021).

The Swedish Private Equity and Venture Capital Association (SVCA) suggests three relevant investment cases for PE: i) growth cases, ii) buyouts and improvements and iii) rescues and turnarounds (SVCA, 2017). Growth cases are typically immature companies that need capital to grow. They also need the expertise and experience of a PE firm to be able to grow and exploit their potential. Buyouts and improvements generally consist of larger and more mature firms that are under-performing or under-leveraged. PE firms look to improve the business model or management practices of such companies or to take on more leverage in order to increase the

company's value. The last investment case, rescues and turnarounds, is not as common as the others. These companies are in distress and struggling. Due to their struggles, the companies can often be purchased at a low valuation, meaning that there could be high returns if the PE firm is able to turn it around. This type of investment case is more typical in times of crisis, such as after the financial crisis in 2008 (SVCA, 2017).

PE and VC firms normally work with a limited time horizon on their funds, typically between 7 to 10 years (Blackstone, 2020). They, therefore, need to exit their investments at some point. According to Achleitner and Figge (2014), the average holding period for a PE investment is 4.5 years. This is also supported by findings from Jenkinson and Sousa (2015) indicating that the holding period for all PE investments is just above four years. However, their findings also indicate that the holding period is somewhat shorter, 3.7 years, when solely accounting for investments exited through the stock markets. In a study by Kaplan and Strømberg (2009) covering 17,171 worldwide leveraged buyouts (LBOs) from 1975–2007, the researchers found that a sale to a strategic buyer is the most popular exit, representing 38% of cases. A sale to another PE firm represented 24% of cases, while IPOs represented 14% of cases for the whole period. The number of exits by IPOs decreased notably during the period of their research. In the first years covering LBOs conducted between 1975–1984, 28% of the companies were exited through an IPO. This figure decreased steadily during the study period. In the period 2003 to 2005, exits by IPOs were 11%. The findings of Kaplan and Strømberg are in line with the findings from Gompers, Kaplan and Mukharlyamov (2015). The researchers asked 79 GPs a series of questions related to their business practices. The answers show that GPs expect to exit about 20% of their investments through IPOs. However, the proportion increases to 26% when solely accounting for large PE firms.

3. Hypotheses

This chapter presents the two formulated hypotheses. We do not conduct a statistical analysis in relation to the first research question of this thesis, namely whether PE and VC firms contribute to shrinking stock markets in Scandinavia. The rationale behind this choice is the fact that we cover all listings and delistings in the research period. Hence, we deem it appropriate to present the data in comprehensive cross-tabulations and charts. The hypotheses are therefore devoted to the second research question of this thesis: How does fundraising drive PE- and VC-backed listings and delistings in Scandinavia?

Hypothesis 1

There is a positive relationship between fundraising[1] and PE- and VC-backed listings.

The literature on PE exits highlights that a sizeable share of such exits take place through IPOs. Kaplan and Strømberg (2009) found that 14% of exits among LBOs in their data sample were conducted through IPOs. Similarly, Gompers et al. (2015) found that GPs expect to exit 20% of their investments through IPOs, increasing to 26% when only accounting for large PE firms. The increase is due to the fact that some of the investments conducted by large PE firms might be too large to sell to a single strategic or financial buyer. Hence, it is necessary to exit these companies through the stock market (Gompers et al., 2015). A year with high fundraising implies that either one or several large PE and VC firms have raised capital, or that many small- or medium-sized PE and VC firms have raised capital. This should lead to increased or larger PE and VC investments in the following years. Either way, we would expect there to be a positive relationship between fundraising and PE- and VC-backed listings.

Hypothesis 2

There is a positive relationship between fundraising and PE-backed delistings shortly after fundraising.

After fundraising, PE and VC firms have a lot of "dry powder" to invest. The more funds committed to the PE and VC firms, the more investments they are able to make. McKinsey & Company (2018) states that GPs pressure LPs to start deploying capital quickly after a year in which much capital has been committed. Correspondingly, Jenkinson and Sousa (2015)

[1] Fundraising refers to PE and VC firms yearly committed capital.

suggest that PE firms conduct most of their investments within the first two years of a fund's lifetime. Further, Ljungqvist et al. (2016) point out that PE is behind a sizeable proportion of the delistings in the U.S. This may indicate that PE firms find many of their target companies on the stock exchange, which can be anticipated to be transferable to the Scandinavian markets. Hence, we expect there to be a positive relationship between fundraising and PE-backed delistings shortly after capital has been committed to PE firms.

VC funds typically never engage in public-to-private delistings as they focus on early-phase investments. We therefore exclude VC firms and their corresponding fundraising from this hypothesis and analysis.

4. Data

This chapter presents the underlying data, defines important terms, and discusses limitations regarding our data.

4.1 Data collection

Our descriptive and empirical analyses build on listing and delisting data from 2006 to 2020 on i) the main stock lists and ii) all stock lists in Scandinavia. Main stock lists refer to the main lists on Oslo Stock Exchange, Nasdaq Stockholm and Nasdaq Copenhagen. Data from the main stock lists covers the entire period from 2006 to 2020. However, data from all stock lists includes data dating back to the introduction of Euronext Growth in 2016, data from Euronext Expand dating back to 2008 and data from Stockholm and Copenhagen First North dating back to 2014.

We received the annual overview of new listed and delisted companies directly from Euronext and Nasdaq. We identify the ownership structure of 434 listed companies and 484 delisted companies on the main stock exchanges. In addition, we identify 896 and 588 listings and delistings, respectively, from all stock exchanges[2]. In the following subsection, we explain how we obtain the companies' ownership structure and market capitalization.

4.1.1 Ownership structure and market capitalization

Extracting ownership information behind listings and delistings is a tedious process. We use prospectuses to manually assemble the ownership structure behind listings. Prospectuses have two main advantages. First, information is reliable as the company issues it with the assistance of its advisors. Second, prospectuses provide us with the ownership structure before the company issues new equity and goes public, thus enabling us to register the owners initiating the listing accurately. If a particular prospectus is not available, we contact companies and listing coordinators. If prospectuses are entirely unavailable, we retrieve shareholder information from the last available annual report prior to a listing. For a tiny fraction of listings, a measure of last resort is to examine the ownership structure from the annual report the same year the company went public, thus after the listing. We set a minimum threshold of 5%

[2] When we include all stock exchanges, listings and delistings between the different lists in the same country are not registered as a listing or a delisting (e.g., a company transferring from Euronext Growth to the main list, or vice versa is not included).

ownership stake to register it as a PE- or VC-backed listing. There is limited access to prospectuses before 2005. Consequently, 2006 is the last year for which we can obtain a meaningful number of prospectuses from the respective countries. Therefore, 2006 works as a natural cut-off for our analysis.

For ownership data regarding delistings, we use company announcements, stock exchange announcements, financial newspapers and other news services. These sources provide us with the reason for a delisting, and in cases of buyouts, the name of the acquiror. To confirm acquisitions, we examine portfolio information from the websites of PE and VC firms.

Market capitalization data is obtained by manually noting the quarterly data from the Eikon database. In the case of listings, we examine the first quarter available after the listing date. As for delistings, we examine the last quarter available prior to the delisting.

4.2 Definitions

The relevant terms and categories used in this thesis are defined below.

4.2.1 Defining private equity and venture capital

In this thesis, PE refers only to firms operating with funds comprised of capital raised from LPs. A consequence of this definition is that family offices are not included in the analysis. Several family offices work in the same manner as PE funds, with buyouts and long-term horizons followed by an exit; however, without external capital and a fund structure, these cases are not classified as PE in this research. Moreover, a second criterion is that the fund must have the same characteristics as a typical PE fund, which is further explained in section 2.6. Therefore, hedge funds and asset management funds that may be able to invest in private companies are not included in the analysis. However, there is one exception to this. State-owned investors, such as Investinor, are in fact included in our analysis, even though they do not receive capital from private LPs.

Regarding the distinction between PE and VC, this thesis bases the classification primarily on the firm's own classification. If the firms do not classify themselves, we place them in a fitting category to the best of our ability and based on the characteristics described in section 2.6. The lines between the two categories may, of course, be thin.

4.2.2 Defining industries

This research works with four industries, inspired by the FactSet Revere Business Industry Classifications System (RBICS). However, we define the industries somewhat more broadly in order to achieve a more comprehensible overview. There are fine lines between many sectors, and several companies operate simultaneously in different sectors. In such cases, the company is placed in the industry associated with its core activities. The definitions of the respective industries are presented in Table 1 below.

Table 1: Industry descriptions

Industry	**Description**
Industry and manufacturing	Companies that produce physical products and solutions. This also includes areas such as oil recovery, mining, and power generation.
Health and life science	Companies that operate in life science, pharmaceuticals, therapeutics, biology, MedTech, clinics, care providers, and gym centres. In short, all companies that work on improving or maintaining health.
IT and technology	IT, software, web platforms, e-commerce, telecom, TV, and technology/high-tech products.
Finance	Investment companies, banks, brokerage and financial services.
Other	Any company that does not fall into one of the above categories.

Table 1 presents the description of the industries used in our descriptive analysis.

4.3 Limitations

There are several limitations with the dataset, which we will address in the following section. As we experience problems securing prospectuses and reliable ownership data before 2006, our analysis consists of fewer years and observations than intended. Ultimately, we cover 15 years spanning the three Scandinavian countries. This provides us with 45 yearly observations

of the dependent and independent variables. Given the somewhat small sample size, we may not have enough power to identify statistical significance.

We go through all prospectuses and note the owners manually. In some cases, the PE and VC firms will establish another company with another name, which will be the holding company for their investment. Occasionally, this leads to somewhat complex organizational structures. It is therefore a small possibility of measurement errors in establishing the dataset.

As in the case of the ownership information, we mark the market capitalization manually. In this process, we may make some human errors. As the quarterly market capitalization is the closest available data to the listings and delistings in the Eikon database, the market capitalization does not represent the closing value on the day of the listing. As a result, the market value associated with each PE and VC listing will deviate to a lesser or greater degree from the market value on the day the company was listed. However, this is not necessarily a weakness as investors will have some more time to evaluate the fair value of the company. There could be certain deviations in the case of delistings as a PE company usually has to pay a premium on the listing price, making the last quarter's market capitalization less representative of the market value at the time of the delisting. Even so, the value in the last quarter will reflect what the market valued the company at on a stand-alone basis.

5. Methodology

This chapter outlines the methodology followed to answer the main research questions, namely how PE contributes to the size of stock markets and how fundraising drives PE and VC listings and delistings. Section 5.1 describes the methodology used to investigate the former question. Subsequently, section 5.2 covers the empirical model used for hypothesis testing in relation to the second question.

5.1 Descriptive analysis

The descriptive analysis is the foundation for answering the first question of this thesis on how PE and VC firms contribute to the size of the stock market, both by number of companies and market value. A thorough investigation enables us to identify the ownership structure of all listed and delisted companies and to register those that are PE- and VC-backed. Thereafter, we end up with a yearly overview of PE- and VC-backed listings and delistings from 2006 to 2020. The analysis further explores which countries and industries who are the most prominent in affecting stock market size by number of companies. We rely on data visualization in charts and cross-tabulations to present our findings.

5.2 Empirical model

Our empirical model is presented below. We begin with the variables, after which we present our model. Finally, we consider the assumptions behind the model.

5.2.1 Variables

The following subsection examines our dependent and independent variables.

5.2.1.1 Dependent variables

We run regressions on three dependent variables to test our hypotheses: i) PE listings, ii) PE and VC listings, and iii) PE delistings. PE listings include merely the listings of companies that are backed by a PE firm. Therefore, companies solely backed by a VC firm is not included. PE and VC listings include companies backed by either PE, VC, or both. Finally, PE delistings include companies acquired by a PE firm in a public-to-private delisting. As there are no VC-

backed delistings, we do not include a combined PE and VC delistings variable. The data and the sources behind the dependent variables are described in more detail in Chapter 4.1.

Table 2 presents summary statistics for the dependent variables. The standard deviations of listings are relatively large compared with delistings, suggesting that PE-backed listings occur less consistently than PE-backed delistings. The maximum value is 13 PE and VC listings.

Table 2: Dependent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
PE listings	45	2.13	2.5	0	12
PE delistings	45	.91	.99	0	3
PE and VC listings	45	2.64	2.8	0	13

Table 2 presents summary statistics for the dependent variables.

5.2.1.2 Independent variables

Table 3 below presents all the independent variables. Volatility, 10-year, and Return are included as proxies for market conditions which we add as a control in all relevant models. The funding lag variable represents committed capital to PE funds headquartered in Scandinavia one and two years prior to delistings. For the three-, four- and five-year lag, fundraising represents committed capital to PE and VC funds. Fundraising is denoted in billion NOK. The highest observation of fundraising is 2019 in Sweden, with 57.89 bn NOK.

Table 3: Independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Volatility	45	42.99	22.04	17.7	114.4
10-year	45	2.02	1.45	-.43	4.52
Return	45	11.49	23.29	-53	70
Funding lag t-1	45	12.55	14.48	.87	57.88
Funding lag t-2	45	11.25	12.82	.87	56.88
Funding lag t-3	45	11.38	12.90	.59	56.88
Funding lag t-4	45	10.59	10.96	.59	54.91
Funding lag t-5	45	10.29	10.94	.59	54.91

Table 3 presents the macro factors and different lags of fundraising. 10-year and Return are denoted in percentage points. The maximum value for 10-year is 4.52%, while the maximum value for Return is 70%.

Market conditions

In our analyses, we control for market conditions to isolate the fundraising effects more effectively. Ritter and Welch (2002) suggest that market conditions are an essential factor in

the decision for a typical firm to go public. In other words, firms will go public when the pricing on the stock exchanges is favorable. Further, GPs have indicated that market conditions are equally important as corporate factors in the decision to exit an investment (Gompers et. al, 2015). We include three macroeconomic variables that we believe are good proxies for market conditions. We control for these factors when testing both our hypotheses. The control variables are the following:

Interest rates (10-year)

Investors typically use the yield on government bonds with 10-year maturity as the risk-free rate of return; that is, the return an investor can expect from a risk-free investment. It can play an essential role in the valuation of companies as it affects the discount rate of future cash flows. Moreover, Angelini, and Foglia (2018) have indicated that interest rates have explanatory power for the number of listings in the U.K. The interest rate data in our analysis consists of the yearly yield of the 10-year government bond for all three countries in Scandinavia. This data is retrieved from Trading Economics, which obtains its data directly from the central banks. Naturally, the yield on these bonds fluctuates on a day-to-day basis. Therefore, we use the yield of June 30th every year. This is not a perfect proxy, but it should be adequately representative of the yield for the respective year.

Volatility

Volatility is another macroeconomic variable that affects market conditions. Further, volatility is often strongly associated with risk, which investors demand to be compensated for. In turn, this may imply that prices must come down to be attractive for investors. The results of Angelini and Foglia (2018) and Tran and Jeon (2011) referred to above indicate that volatility has explanatory power for the number of listings in both the U.K. and U.S. markets. Volatility represents the daily standard deviation on the benchmark indexes. This is calculated by the following formula:

$$SD = \sqrt{\frac{\sum(x - \bar{x})^2}{n}}$$

where x = the daily price of the benchmark, $\bar{x}$ = the average benchmark price for the respective year, and n = the number of trading days the respective year.

Stock market performance (Return)

A high stock market performance indicates that the prices of listed companies have increased. Ritter (1991) has suggested that firms take advantage of periods when the stock market, or some sectors within it, are overvalued. In other words, at some periods there is a "window of opportunity" when a public listing will receive a higher price than what might be the "fair value" of the firm. Tran and Jeon (2011) also find that the stock market performance plays an important role in the timing of IPOs in the U.S. markets. The stock market performance data is based on the percentage price change of the benchmark index[3] in each respective country, from the first trading day of the year to the last. The prices of the benchmark indexes are based on data from the Eikon database.

Fundraising

Fundraising refers to capital commitments made to the PE and VC funds. We add together all the capital commitments made to any PE and VC firm headquartered in Scandinavia per calendar year from 2000 to 2020, with data collected from the Eikon database. The fundraising variables is our variables of interest. We work with different lags in order to test our hypotheses. To test our first hypothesis – whether there is a positive relationship between fundraising and PE- and VC-backed listings – it is necessary to establish the expected holding period. Most of the literature seems to point to a four- to five-year holding period for PE investments independent of exit market (Achleitner and Figge, 2014; Pitchbook, 2021; Jenkinson and Sousa, 2015). However, findings by Jenkinson and Sousa (2015) suggest that investments exited through the IPO market have a somewhat shorter holding period of 3.7 years. Therefore, we find it comprehensive to include fundraising variables with lags ranging from three to five years. We include the following variables of interest for testing our first hypothesis:

Table 4: Variables of interest for Hypothesis 1

Variable	Description
Fundraising with a three-year lag	The total capital committed by LPs to GPs in the calendar year three years prior to listings.
Fundraising with a four-year lag	The total capital committed by LPs to GPs in the calendar year four years prior to listings.

[3] OSEBX, OMXSBGI and OMXCBGI

Fundraising with a five-year lag	The total capital committed by LPs to GPs in the calendar year five years prior to listings.

Table 4 presents the variables of interest used to test Hypothesis 1.

For our second hypothesis – namely that we expect there to be a positive relationship between fundraising and PE-backed delistings shortly after the fundraising – we also base our lags on previous research. The study by Jenkinson and Sousa (2015) is quite specific in indicating that most PE investments occur within the first two years of the fund's duration. McKinsey's (2018) suggestion that PE are pressured to initiate investments "quickly" after fundraising is somewhat vaguer. However, we regard the first two years after the fundraising as "quickly." Therefore, we find it comprehensive to test for a one-year and a two-year lag. Hence, we use the following two variables of interest to test our second hypothesis:

Table 5: Variables of interest for Hypothesis 2

Variable	**Description**
Fundraising with one-year lag	The total capital committed by LPs to GPs in the calendar year one year prior to public-to-private delistings.
Fundraising with a two-year lag	The total capital committed by LPs to GPs in the calendar year two years prior to public-to-private delistings.

Table 5 presents the variables of interest used to test Hypothesis 2.

5.2.2 Model specification

Our data covers observations of PE and VC listings and delistings for the three Scandinavian countries over 15 years. We apply an OLS estimator to conduct our analysis. This technique is common in estimating the coefficients of linear regressions where the goal is to describe the relationship between independent variables and a dependent variable. The OLS estimator is flexible as it allows us to include multiple periods and units. The estimator is calculated by minimizing the sum of squared residuals between the observed and predicted values. Moreover, by including year fixed effects we can adjust for unobservable time specific effects (Woolridge, 2016). We control for year fixed effects as our data consists of yearly observations spanning

three countries. In other words, the effect of year *t* is fixed across countries. Moreover, since market conditions are country-specific, we achieve the necessary variation. For example, the interest rate measure in Norway in 2006 differs from the corresponding measure in Sweden and Denmark.

A simple linear regression examines how *y* varies with changes in *x* and consists of only one independent variable. The equation for a simple linear regression is written as follows:

$$y = \beta_0 + \beta_1 x + u$$

However, we quickly discard the use of a simple regression model as it rarely works well as an empirical tool. Consequently, we include several independent variables, as described in the previous subsection, to control for other relevant factors that could affect the dependent variable. By including several independent variables, the regression becomes more compliant in isolating the effect from fundraising. Not surprisingly, we can explain more of the variation in our dependent variable when we include more variables that are helpful in explaining it. The equation for a multiple linear regression model with an undetermined number of independent variables can be written as follows (Woolridge, 2016):

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k + u$$

Where:

y = the dependent variable,
β_0 = the intercept,
β_1= the parameter associated with x_1,
β_2= the parameter associated with x_2,
This continues for all the variables included,
u = the error term.

All analyses in this thesis work with the same three macroeconomic factors as independent variables. The only independent factors that change are the fundraising lags. Regressions one, two and three are the foundations for testing Hypothesis 1. Regressions four and five test Hypothesis 2. The respective regressions are formulated below:

(1) $$Y_{it} = \beta_o + \beta_1 I_{it} + \beta_2 V_{it} + \beta_3 R_{it} + \beta_4 FR\_3_{it} + Year\ FE_t + u_{it}$$

(2) $$Y_{it} = \beta_o + \beta_1 I_{it} + \beta_2 V_{it} + \beta_3 R_{it} + \beta_4 FR\_4_{it} + Year\ FE_t + u_{it}$$

(3) $$Y_{it} = \beta_o + \beta_1 I_{it} + \beta_2 V_{it} + \beta_3 R_{it} + \beta_4 FR\_5_{it} + Year\ FE_t + u_{it}$$

(4) $$Y_{it} = \beta_o + \beta_1 I_{it} + \beta_2 V_{it} + \beta_3 R_{it} + \beta_4 FR\_1_{it} + Year\ FE_t + u_{it}$$

(5) $$Y_{it} = \beta_o + \beta_1 I_{it} + \beta_2 V_{it} + \beta_3 R_{it} + \beta_4 FR\_2_{it} + Year\ FE_t + u_{it}$$

Where:

Y = PE listings, PE delistings, PE and VC listings,

I = Interest,

V = Volatility,

R = Return,

FR_1, FR_2, FR_3, FR_4, FR_5 = Fundraising with lags of 1, 2, 3, 4 and 5 years, respectively.

Year FE = Yearly fixed effects; dummy for each year, with 2006 as the "benchmark",

u = error term.

5.2.3 Model testing

For the OLS estimator to be the best linear unbiased estimator (BLUE), several assumptions must hold. First, for the estimator to be unbiased there are four assumptions that must be satisfied. These are: i) linear in parameters, ii) random sampling, iii) zero conditional mean, and iv) no multicollinearity. Moreover, in order to have the most efficient linear unbiased estimator, there is an assumption of homoskedasticity. If all these five assumptions are satisfied, the OLS is BLUE (Woolridge, 2016). In addition, there is a sixth assumption called normality. When we include the sixth assumption, we can call it the classical linear model assumptions (Woolridge, 2016).

We run all relevant tests to investigate whether the OLS assumptions hold. Test results are presented in the Appendix, Chapter 9.1. In summary, we observe multicollinearity among macroeconomic factors, which is reflected in variance inflation factors (VIFs). We emphasize that no multicollinearity is observed among fundraising variables, meaning that the reliability of estimated coefficients is not affected. For the homoskedasticity assumption, a Breusch-Pagan/Cook-Weisberg test indicates violations and a presence of heteroskedasticity, which we address by implementing robust standard errors. Regarding the normality assumption, six out of eight models do not pass the normality test with a positive kurtosis as the primary cause. We further investigate the normality through a kernel density and residual plot, suggesting that the

non-normality is only marginal and likely to have a limited effect on the analyses. Based on our model testing, we emphasize that we must be very cautious about causal interpretations. The primary source of bias most probably relates to the zero conditional mean assumption, which is hard to test for, and thus satisfy.

6. Findings and discussion

This chapter presents the findings from both the descriptive analysis and regression results. In subsection 6.1, we present the PE and VC contribution to listings and delistings on the Scandinavian stock markets. In addition, subsections 6.1.2 and 6.1.3 presents listing activities at country and industry levels, respectively. The final subsection presents findings from the regression analysis. Each subsection is followed by a discussion.

We refer to "PE and VC" when discussing a listing backed by either a PE fund, VC fund, or both. "PE" is used when a listing is solely PE-backed, and the same applies to "VC."

6.1 Descriptive findings

6.1.1 Scandinavia

Figure 2 below illustrates all the listings and delistings on the main lists in Scandinavia from 2006–2020 by number of companies. In Scandinavia, listings outnumbered delistings in seven out of 15 years. In total, there were 434 listings and 484 delistings during the study period, totaling a net decrease of 50 companies. The years in which listings were outnumbered by delistings occurred consecutively from 2008–2014. The years with the highest numbers of listings and delistings were 2006 and 2008, respectively.

When it comes to PE- and VC-backed listings and delistings, listings outnumbered delistings in 12 out of 15 years. There were 119 listings in total, and only 41 delistings through buyouts and acquisitions. The net contribution of PE and VC firms was therefore 78 more exchange-traded companies. PE and VC firms accounted for 27.4% of the total listings by number of companies. Regarding delistings, PE and VC firms accounted for 8.5% of the total amount by number of companies. Furthermore, if we exclude listings and delistings backed by VC funds, and solely look at PE contribution, the findings point to the same conclusion: PE-backed listings outnumbered delistings in 12 out of 15 years, with a net contribution of 55 exchange-traded companies.

Figure 2: Scandinavia by number - main lists

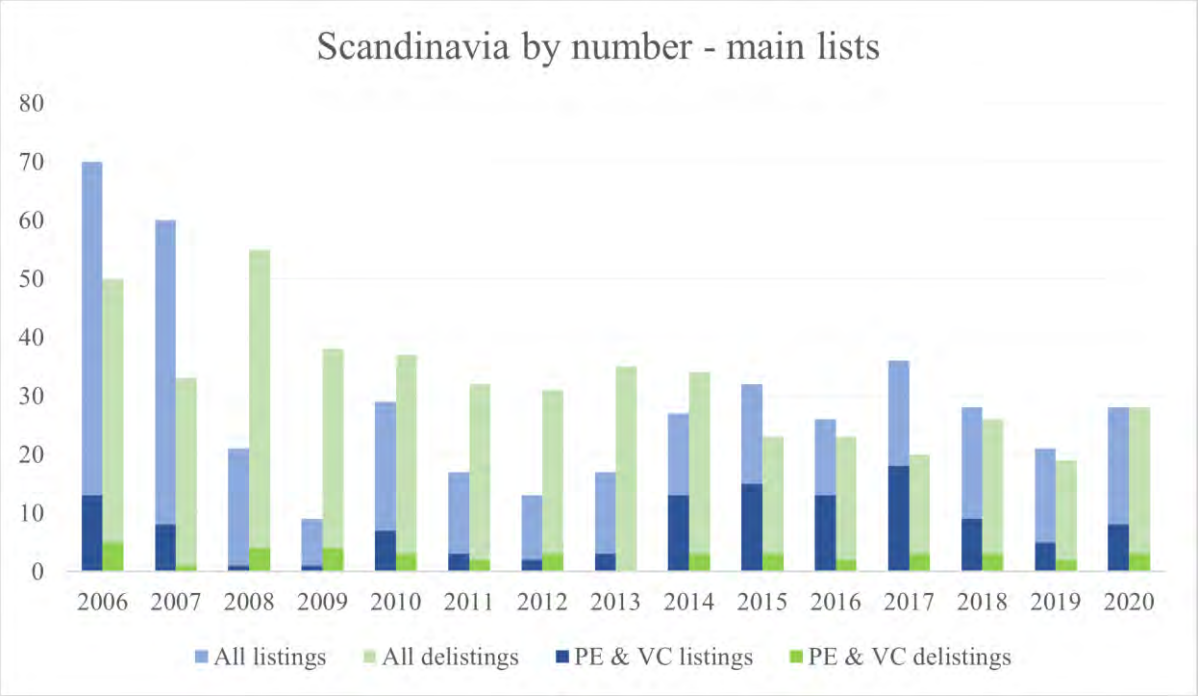

Figure 2 presents the total new listings and delistings on the main lists in Scandinavia from 2006–2020 measured by number of companies. PE- and VC-backed listings and delistings are marked in dark blue and green, respectively. See appendix for a tabular version of the data.

Figure 3 below includes listings on Oslo Expand from 2008, Euronext Growth from 2016 as well as Stockholm and Copenhagen First North since 2014, in addition to the main lists. These inclusions explain the increase in listings from 2014. Not surprisingly, VC alone was not behind any delistings on either list. Therefore, we will only refer to PE in regards of delistings going forward.

There is only a modest increase in PE-backed delistings, from 41 to 44 when all lists are included. This result means that there were few acquisitions by PE firms of companies listed on the growth lists. The year with the highest proportion of PE-backed delistings to total delistings was 2014 with 10.9%.

Further, figure 3 illustrates that there was generally high listing activity in the growth markets, which are less regulated and thereby have fewer requirements than the main markets. In total, there were 896 listings and 588 delistings on all markets in the study period. There was 193 PE- or VC- backed listings and 44 PE-backed delistings, with a net contribution of 149 companies. PE and VC firms accounted for 21.5% of all listed companies in the data sample, but only 7.5% of the delistings.

Figure 3: Scandinavia by number - all lists

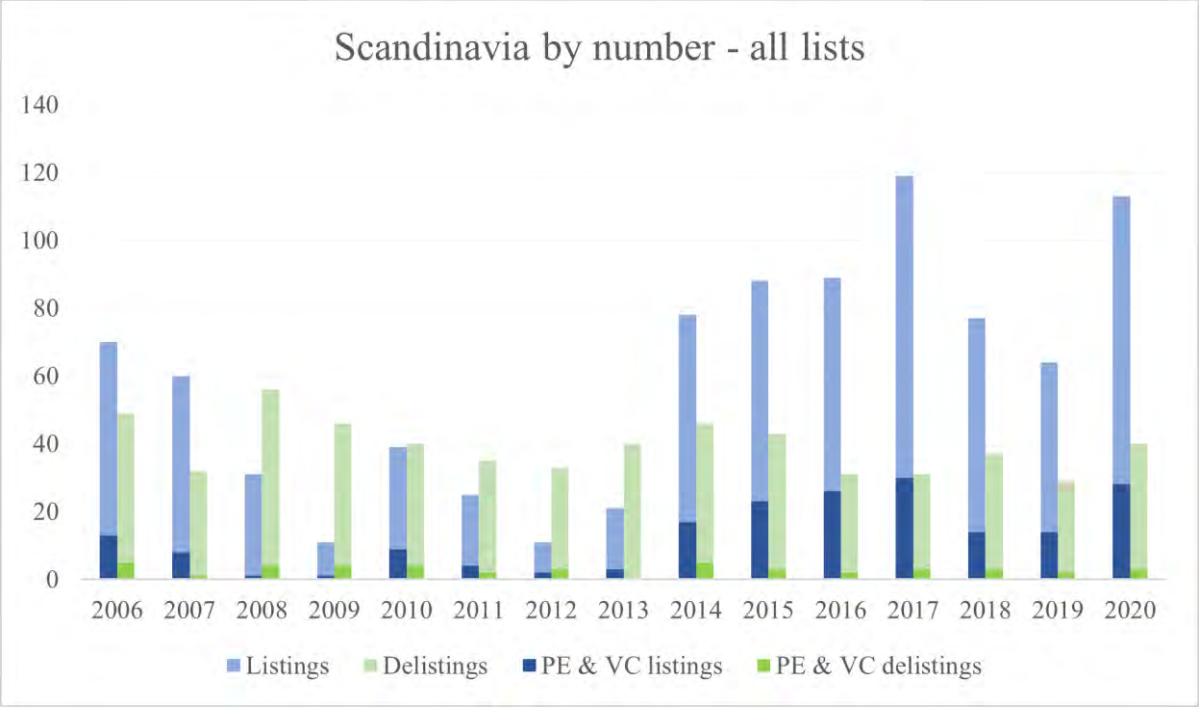

Figure 3 presents the total new listings and delistings on all lists in Scandinavia from 2006–2020 measured by number of companies. All lists include Oslo Expand from 2008, Euronext Growth from 2016 as well as Stockholm and Copenhagen First North since 2014.

Figure 4 illustrates listings by market capitalization. The first noteworthy observation is the standout year 2007. This was the year that Nokia was delisted from Nasdaq Stockholm with a market capitalization of about 667 billion NOK. As seen, delistings of such high value are rare in Scandinavia. 2006 was the year with the highest delisting activity by value backed by PE firms, with a PE-backed delisting value of 48 billion. However, the year with the highest relative delisting activity initiated by PE firms was 2019, with 56.3% of the total delistings. This was the only year when PE firms accounted for more than half of the delisted value. For the entire period, PE and VC accounted for a proportion of 6.3% of the total delisting amount by market value.

As with the number of listed companies, PE and VC firms contribute much more to listings in terms of value than they do to delistings. In 11 of the 15 years covered, PE and VC listings outweighed delistings in value. The total listed value in the study period was 760 bn NOK, while the total delisted value was 151 bn NOK. 2016 was the strongest year for PE- and VC-backed listings, with a total value of 218 billion NOK. The year with the most valuable PE- and VC-backed listings compared to total listings was also 2016, with PE- and VC-backed

listings accounting for 78.3% of the total listed value that respective year. PE- and VC-backed listings accounted for 35.2% of the value for the entire period.

Figure 4: Scandinavia by market capitalization - main lists

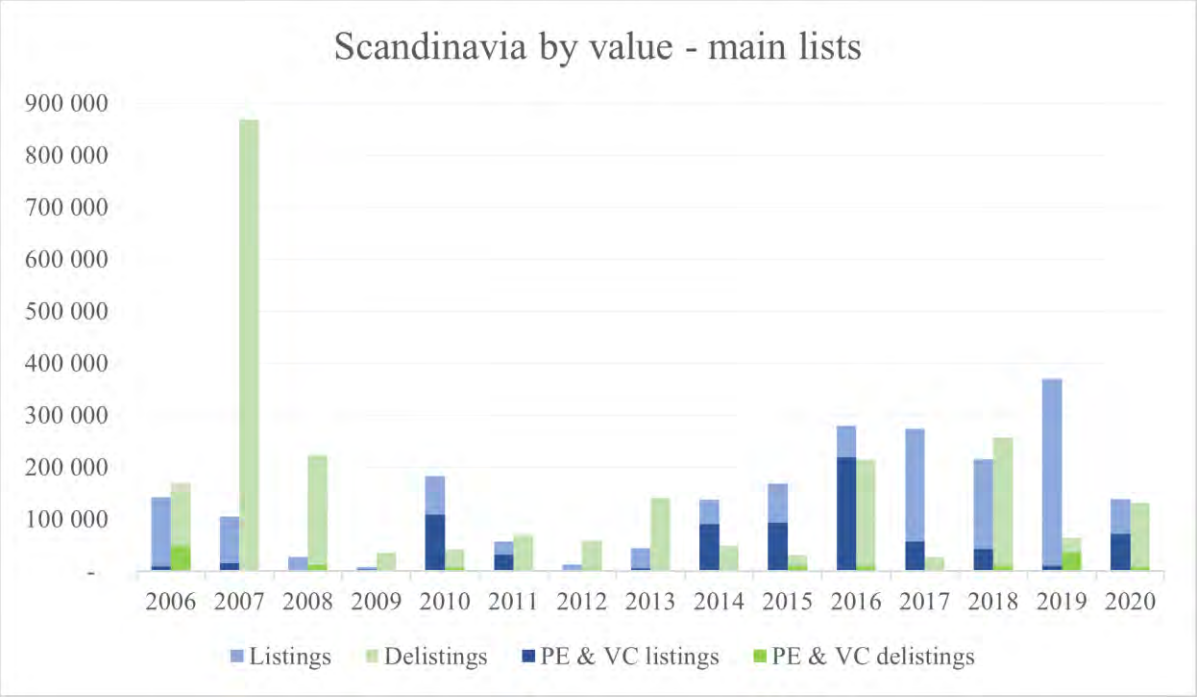

Figure 4 presents the total listings and delistings on the main lists in Scandinavia from 2006–2020 measured by market capitalization.

The findings indicate that PE and VC firms do not contribute to excessive delistings in Scandinavia, neither by number of companies nor market value. The PE-backed delisting proportion of 7.5% by number of companies and 6.3% by market value, leaves little reason for concern. However, the low proportion of PE-backed delistings in Scandinavia contradicts Ljungqvist et al.'s (2016) findings from the U.S., where PE is behind a sizeable share of the delistings. Further, the authors suggests that the excessive delisting activity by PE could lead to negative externalities in the economy. Conversely, PE- and VC-backed listings account for a sizeable proportion of the total listings. This should indicate that PE firms do not contribute to negative externalities in Scandinavia. In contrast, our findings may indicate that PE firms contributes to positive externalities. More precisely, an increased number of listed companies may contribute to a more business-friendly environment. Furthermore, more listed companies result in a higher number of companies being exposed to a broader and more efficient pricing system. Thus, this makes the market a more efficient provider of information, which might be advantageous for resource allocation (Hayek, 1945; Alan and Schwartz, 2013). Ultimately,

more listings can facilitate more accessible capital markets and increase exposure to ESG-related activities for the companies in question. Further, the results demonstrate that growth markets are thriving in Scandinavia. Increased attention to small and medium-sized enterprises (SMEs) on the stock exchanges has been identified by Cleary et al. (2017) as favorable in the process of fostering economic growth and sustainable development. However, we can only speculate on whether PE and VC listing activities contribute to positive externalities in the economy as it remains outside the scope of this thesis.

6.1.2 Country specific findings

Findings from Scandinavia suggest that PE and VC firms do not contribute to shrinking stock markets measured in listings and value. The following sub-sections examines how each Scandinavian country contributes to the findings above.

Sweden

Figure 5 summarizes (de)listings in Sweden on the main lists in the study period. Listings, in general, outnumber delistings in nine out of 15 years, with a net addition of 20. Looking at the PE and VC contribution, there was relatively high activity between 2014–2020, with a peak of 13 PE- and VC-backed listings in 2015. PE- and VC-backed listings outnumber PE delistings in 11 out of 15 years. In total, there were 67 PE- and VC-backed listings and 23 delistings in Sweden during the study period. PE- and VC-backed listings accounted for 34.7% of all listings and 13.9% of delistings by number. The same trend applies to PE alone, with a net contribution of 32 listings. In 2015, PE- and VC-backed listings accounted for 68% of all listings, suggesting that the PE model is well established in Sweden.

Regarding value in Sweden, listings in the study period valued a total 997 billion NOK, while delistings valued 1,495 billion NOK. However, as aforementioned, Nokia accounted for 667 billion and 44% of the total delisting value. Excluding Nokia would result in a net increase in listed value. For PE and VC firms combined, listings valued 266 billion, accounting for a proportion of 26.7% of all listings. Delistings valued 110 billion NOK, accounting for a proportion of 7.4% of total delistings in Sweden. For PE alone, listings valued 249 billion and delistings valued 110 billion NOK.

Figure 5: Sweden by number - main list

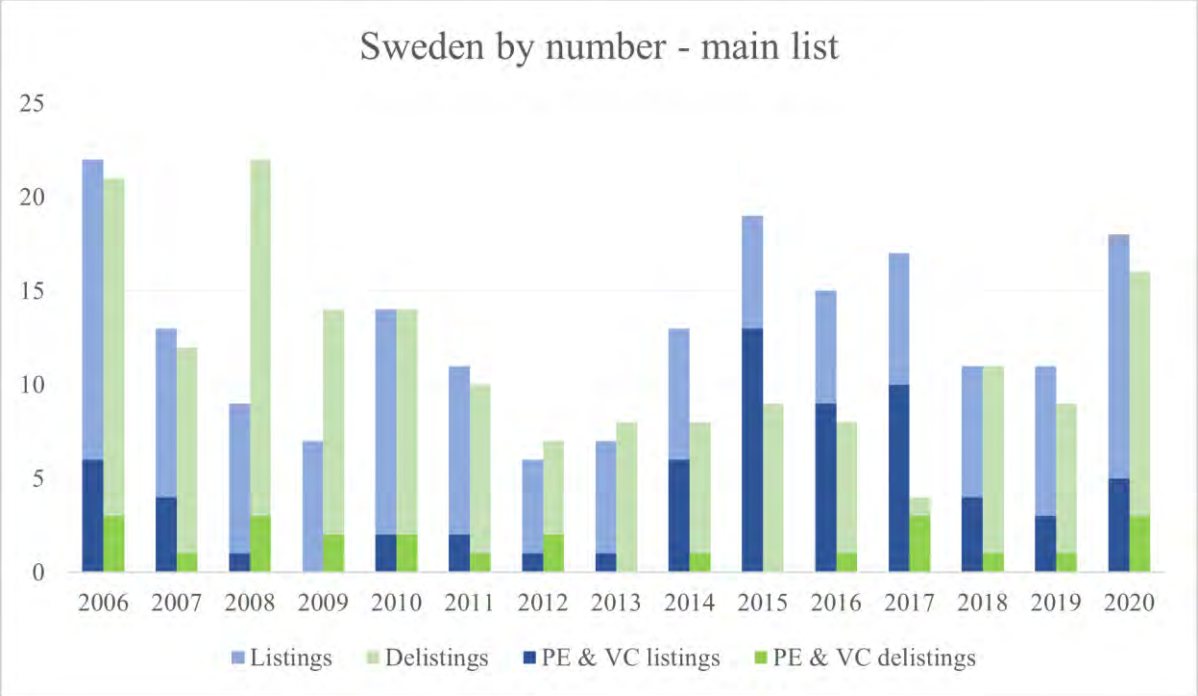

Figure 5 presents listings and delistings on the main list in Sweden from 2006–2020, measured by number of companies.

Sweden clearly stands out amongst Scandinavian countries regarding PE and VC activity as they contribute with the significantly most listed and delisted companies backed by PE and VC. However, the number of listings significantly outnumbers the number of delistings. Therefore, PE and VC in Sweden by no means contribute to excessive delistings or shrinking of Scandinavian stock markets. The discussion that stems from the Scandinavian findings is, therefore, highly representable for Sweden. Some of the largest and most active PE firms in Europe have their headquarters in Sweden. These include firms such as EQT, Altor and Nordic Capital, which hold a long and impressive track record. It is natural to believe that these firms help facilitate a cluster that works as a catalyst for the country's high PE and VC activity (SVCA, 2020).

Denmark

In figure 6 below, we present the listing and delisting count for Denmark. Denmark stands out for its high number of delistings relative to listings. Delistings outnumbered listings in 13 out of 15 years, with a net count of -46. On the contrary, PE- and VC-backed listings outnumbered delistings in 10 out of 15 years. There were 19 PE- and VC-backed listings and two delistings in Denmark during the overall study period. PE and VC listings accounted for 25.7% of all

listings and only 1.7% of delistings by number of companies in the study period. The same trend holds when only looking at PE, with a net contribution of 11 listings.

Regarding value of listings in Denmark, listings valued 454 billion NOK during the study period, while delistings valued 300 billion NOK. This finding contradicts the notion that delistings outnumber listings. When looking at PE and VC combined, the listings valued 373 billion NOK, while delistings valued only 2 billion. Regarding PE and VC listed value, Denmark represents the most considerable contribution in Scandinavia, with a share of 49%. The most significant contributor here is the listing of Dong Energy, with a market capitalization of 126 billion, backed by the Goldman Sachs PE division. PE alone produces similar results, as listings valued 363 billion NOK.

Figure 6: Denmark by number - main list

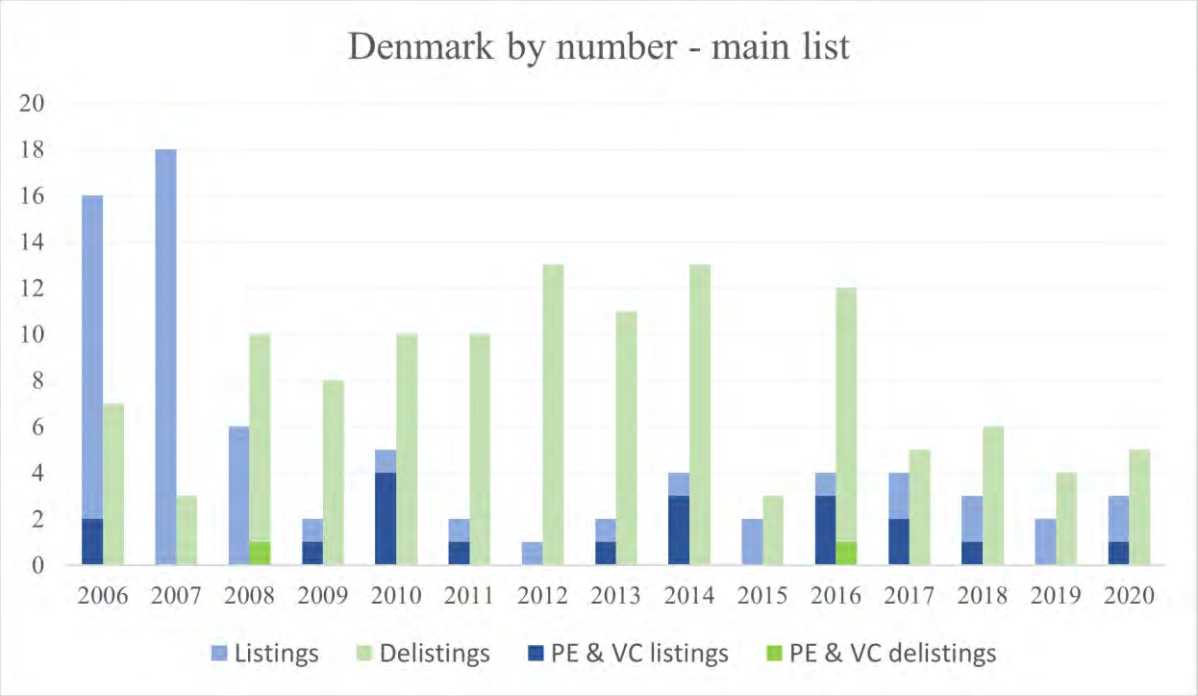

Figure 6 presents listings and delistings on the main list in Denmark from 2006–2020, measured by number of companies.

The PE and VC activity in the Danish stock exchanges is limited. There were only two delistings during the period of the study. It is therefore very clear that PE does not contribute to excessive delistings in Denmark. The fact that listings significantly outnumber delistings also indicates that PE does not contribute to shrinking stock markets in Denmark. It is somewhat surprising that Denmark is the country with the highest PE- and VC-backed listings by market value. A low number of companies listed, but high market value may suggest that

small companies are not attracted to the Danish main list. This is in line with Doidge et al. (2018), who contended that small firms are generally not attracted to the U.S. stock markets, which leads to only older and larger firms being listed. According to the authors, this trend partially explains the listing gap seen in the U.S. Moreover, it is interesting to note that after the financial crisis in 2008, the number of listings in general fell dramatically – from 34 listings in 2006 and 2007 alone, to only 40 cumulative listings between 2008 and 2020. Næss-Schmidt (2018) has reported that much of the risk capital in Denmark disappeared after the financial crisis and mistrust arose among investors, especially concerning the smaller companies. However, we do not engage in any speculation as to whether this is the cause of the low number of listings after the financial crisis.

It is worth mentioning that the general PE market in Denmark has seen strong growth during the last decade. In 2008, approximately 100 companies were owned by a PE firm, compared to approximately 300 companies in 2018 (Preqin, 2019). Based on this trend, it would be interesting to follow the PE and VC listing development over the next few years.

Norway

The Norwegian statistics are illustrated in Figure 7 below. Norway exhibits a similar pattern as Scandinavia in general, as delistings outnumbered listings in seven consecutive years from 2008 to 2014. There were 167 listings and 191 delistings in general in our sample, with a net count of -24. Looking at the PE and VC contribution, listings outnumbered delistings in 11 out of 15 years. There were 33 listings and 16 delistings, with a net contribution of 17. PE and VC accounted for 19.8% of listings and only 8.4% of total delistings by number of companies. Excluding firms backed by VC produces similar results with 28 PE-backed listings.

Looking at the value of listings in general in Norway, the total value of listings amounted to 703 billion NOK in our sample, while delistings valued 566 billion NOK. In contrast to the trend in number of companies, the exchange therefore increased in value. For PE and VC, the listings valued 121 billion NOK while delistings only valued 38 billion NOK, again indicating a positive contribution. Excluding VC and looking only at PE, the relevant listings valued 110 billion.

Figure 7: Norway by number - main list

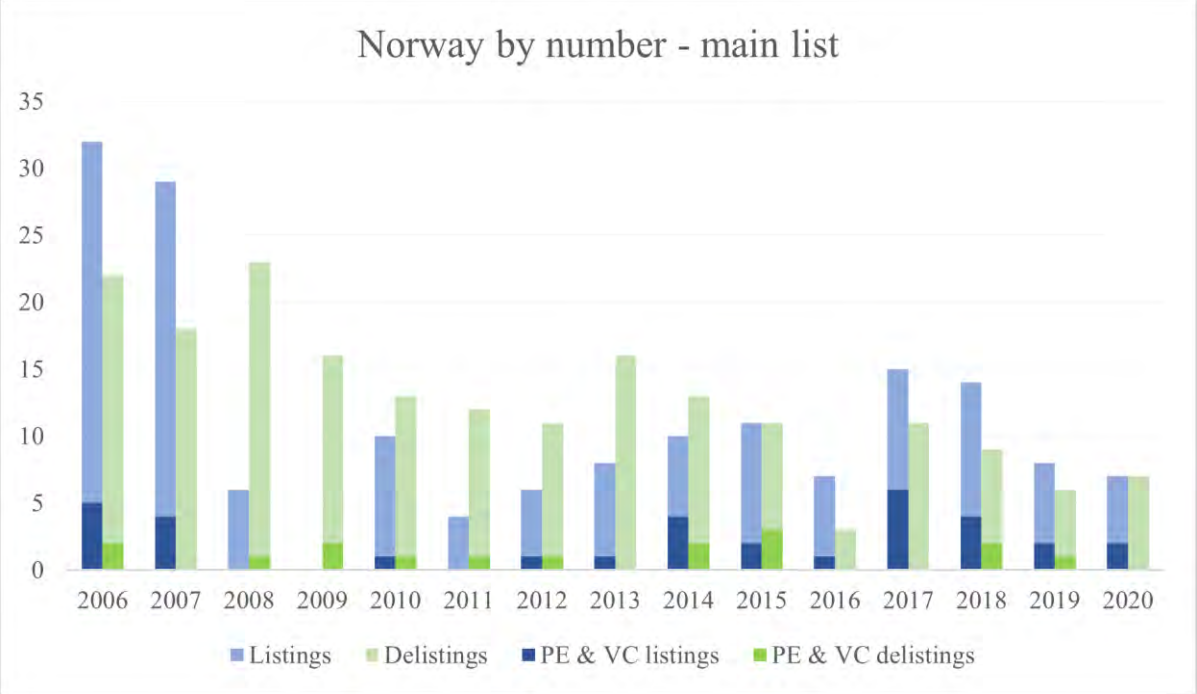

Figure 7 presents listings and delistings on the main list in Norway from 2006–2020, measured by number of companies.

The PE and VC stock market activity in Norway lies somewhere between that of Sweden and Denmark. It is not as flourishing as the Swedish market, but simultaneously rather more active than the Danish market in terms of number of companies. Norway has the same net contribution as Denmark, but both the number of listings and delistings are significantly higher in Norway. With an average PE-backed delisting amount of just above one company per year and a clear outnumbering of listings compared to delistings, it seems clear that PE and VC firms in Norway do not contribute to shrinking stock markets.

When it comes to PE delistings, the relatively low number suggests that most buyout transactions in Norway happen through a private company being sold to a PE firm. This is also in line with Bienz, Thorburn and Walz (2016), who found that among more than 60 PE buyout transactions in their data sample, only two were subject to public-to-private transactions. This finding affirms that PE firms in Norway typically find their target companies in the private markets rather than on the stock exchange.

6.1.3 Industry-specific findings

The following sub-sections examines the PE and VC activity between industries. Sub-section 4.2.2 describes the definition of the industries.

Table 6 categorizes the number of PE and VC listings and delistings by industry from 2006 to 2020. Industry and manufacturing is the most dominant industry in terms of listings, with 35 PE- and VC-backed listings during the study period. Health and life science was the industry with the second-highest number of listings at 29. The finance industry, in contrast, is where PE and VC are the least active, both in terms of listings and delistings. Meanwhile, IT and technology stand out regarding PE-backed delistings. From 2006 to 2020, there were 19 PE-backed delistings within this industry. Industry and manufacturing contributed to the second most delistings with 10. In total, these two industries accounted for 29 of the 41, and 70.7%, of the delistings. Finally, there were 27 listings and eight delistings in the "other" category.

Table 6: Scandinavia – main lists

Scandinavia - main lists										
	Industry & manufacturing		Health & life science		IT & technology		Finance		Other	
Year	Listings	Delistings	Listings	Delistings	Listings	Delistings	Listings	Delistings	Listings	Delistings
2006	3	1	5	2	2	1	0	0	3	1
2007	3	1	2	0	3	0	0	0	0	0
2008	0	1	1	0	0	1	0	0	0	2
2009	0	0	1	0	0	3	0	0	0	1
2010	3	1	1	0	1	0	0	0	2	2
2011	2	2	0	0	0	0	0	0	1	0
2012	1	0	0	0	1	3	0	0	0	0
2013	1	0	1	0	0	0	0	0	1	0
2014	5	1	1	0	2	2	0	0	5	0
2015	5	0	3	0	2	2	1	0	4	1
2016	2	1	3	0	2	1	1	0	5	0
2017	7	0	6	0	4	2	0	1	1	0
2018	0	1	1	0	4	1	1	1	3	0
2019	1	0	3	0	0	1	0	0	1	1
2020	2	1	1	0	2	2	2	0	1	0
Sum	**35**	**10**	**29**	**2**	**23**	**19**	**5**	**2**	**27**	**8**

Table 6 presents listings and delistings on the main lists in Scandinavia, categorized by industry.

Table 7 includes all stock markets in Scandinavia. Industry and manufacturing is again the industry with the most listings counting 57. Furthermore, the number of IT and technology listings (48) surpasses the listings in the health and life science industry (47) when including all lists. As the PE-backed delisting activity on the growth markets is relatively modest, there is only a slight increase in some industries. The delistings in IT and technology increase to 20 when including all lists, while the delistings in the health and life science industry double from

two to four. There is no delisting increase in either industry and manufacturing or the finance industry when including all lists.

Table 7: Scandinavia – all lists

Scandinavia - all lists										
	Industry & manufacturing		Health & life science		IT & technology		Finance		Other	
Year	Listings	Delistings	Listings	Delistings	Listings	Delistings	Listings	Delistings	Listings	Delistings
2006	3	1	5	2	2	1	0	0	3	1
2007	3	1	2	0	3	0	0	0	0	0
2008	0	1	1	0	0	1	0	0	0	2
2009	0	0	1	0	0	3	0	0	0	1
2010	4	1	2	0	1	0	0	0	2	3
2011	2	2	0	0	0	0	0	0	2	0
2012	1	0	0	0	1	3	0	0	0	0
2013	1	0	1	0	0	0	0	0	1	0
2014	8	1	2	0	2	3	0	0	5	1
2015	8	0	6	0	4	2	1	0	4	1
2016	7	1	8	0	4	1	2	0	5	0
2017	8	0	9	0	9	2	1	1	3	0
2018	1	1	3	0	4	1	1	1	5	0
2019	4	0	4	0	4	1	0	0	2	1
2020	7	1	3	0	14	2	2	0	2	0
Sum	**57**	**10**	**47**	**2**	**48**	**20**	**7**	**2**	**34**	**10**

Table 7 presents listings and delistings on all lists in Scandinavia, categorized by industry. All lists include Oslo Expand from 2008, Euronext Growth from 2016 as well as Stockholm and Copenhagen First North since 2014.

An interpretation that could be made regarding PE and VC activity by industry is that companies in industry and manufacturing typically earn higher valuations on the stock market than other industries. As a result, they could be the most attractive companies to exit through stock listings. Another interpretation could be that the size of these companies is typically larger than companies in other industries. Therefore, it could be more difficult to sell these companies to a single strategic or financial buyer. At the same time, the health and life science and IT and technology industries follow closely. However, we emphasize that we do not conduct enough tests to affirm that industry and manufacturing companies are the most attractive to exit through the stock market. Further, the results could indicate that several IT and technology companies on the stock exchanges fit one or more of the investment cases suggested by SVCA (2017), as this is the industry with the most delistings. This would imply that numerous companies in this industry are either growing at a rapid pace, under-performing/under-leveraged, or in distress after a stock listing.

6.2 Regression results

This section presents and discusses the findings from the regression analyses.

Fundraising and listings

Columns 1 to 6 in Table 8 below present the relationship between fundraising and PE- and VC-backed listings three, four and five years after fundraising.

We repeat the relevant hypothesis: *There is a positive relationship between fundraising and PE- and VC-backed listings.*

We observe positive relationships for all six coefficients covering the fundraising three-, four- and five-year lag. However, the three-year lags in columns 1 and 2 stand out as significant at the 1% level. Furthermore, there are only marginal differences between the coefficients when limiting to PE, relative to PE and VC combined. A difference is visible only for the four-year lag, suggesting a somewhat stronger relationship when including VC.

Table 8: Testing Hypothesis 1

	(1) PE listings	(2) PE & VC listings	(3) PE listings	(4) PE & VC listings	(5) PE & VC listings	(6) PE & VC listings
10-year	0.75	0.40	0.53	0.28	0.19	0.19
	(0.63)	(0.81)	(0.72)	(0.85)	(0.89)	(0.89)
log (Volatility)	1.54	1.15	1.74	1.23	1.44	1.44
	(2.34)	(2.40)	(2.47)	(2.45)	(2.45)	(2.45)
Return	-0.02	-0.04	-0.02	-0.03	-0.04	-0.04
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)
Funding lag t-3	0.07***	0.07***				
	(0.02)	(0.02)				
Funding lag t-4			0.02	0.05		
			(0.03)	(0.04)		
Funding lag t-5					0.01	0.01
					(0.03)	(0.03)
Constant	-5.41	-0.90	-5.08	-1.04	-0.76	-0.76
	(10.24)	(11.42)	(10.64)	(11.35)	(11.64)	(11.64)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	45.00	45.00	45.00	45.00	45.00	45.00
r2	0.47	0.48	0.39	0.44	0.42	0.42
F	5.93	30.52	2.58	2.45	2.41	2.41

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8 presents the results from regressions with year-fixed effects with three different fundraising lags to test Hypothesis 1. For each fundraising lag, we test for both PE alone and for PE and VC combined.

The results suggest that higher fundraising is associated with more PE- and VC-backed listings three years later. This aligns with Kaplan and Strømberg (2009) and Gompers et al. (2015), who found that a sizeable amount of PE investments is exited though IPOs. Further, the results are in line with the findings by Jenkinson and Sousa (2015), suggesting a 3.7 year holding period for investments exited through an IPO. However, we do not find support for either four or five year-lags. Hence, the results do not align with Achleitner and Figge's (2014) research, which suggests a 4.5 year holding period for PE investments. The results may suggest that investments that are exited through an IPO have a shorter holding period than investments exited through alternative markets. Nonetheless, we have not conducted any tests to confirm this suggestion.

Fundraising and delistings

Columns 7 and 8 in Table 9 lay the foundation for testing Hypothesis 2.

We recall our hypothesis: *There is a positive relationship between fundraising and PE-backed delistings shortly after fundraising.*

We observe positive relationships for both lags of fundraising. The coefficient for funding lag (t-1) is significant at the 5% level. The interpretation is that an increase of one billion NOK in fundraising is associated with 0.03 more PE delistings one year after fundraising. However, the relationship is not significant for the two-year lag in column 8.

Table 9: Testing Hypothesis 2

	(7) PE delistings	(8) PE delistings
10-year	0.28	0.13
	(0.46)	(0.42)
log (Volatility)	-0.82	-0.95
	(1.03)	(0.96)
Return	0.00	-0.00
	(0.02)	(0.02)
Funding lag t-1	0.03**	
	(0.01)	

Funding lag t-2		0.02
		(0.01)
Constant	3.18	4.67
	(5.02)	(4.59)
Year fixed effects	Yes	Yes
N	45.00	45.00
r2	0.30	0.22
F	2.51	2.11

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9 presents the results from regressions with year-fixed effects with two different fundraising lags to test Hypothesis 2. As VC firms are not behind any delistings, we only run the regressions with PE as the dependent variable.

Column 7 suggests that increased fundraising leads PE to initiate more public-to-private delistings. The result may indicate that PE firms initiate investments rather quickly after fundraising. This finding aligns with McKinsey & Company's (2018) suggestion that LPs pressure GPs to deploy capital quickly after a large amount of capital has been committed. Similarly, it supports Jenkinson and Sousa's (2015) finding that a PE firm initiates most of its investments during the first two years of a fund's duration. Intuitively, this is reasonable based on the typical fixed duration for PE funds of seven to 10 years (Blackstone, 2020). It is somewhat unexpected that we cannot find statistical support for the two-year lag, as we anticipated that several investments are likely to occur also in the second year.

7. Conclusion

This thesis investigates the following two questions: i) Do PE firms contribute to shrinking stock markets in Scandinavia? ii) How does fundraising drive PE- and VC-backed listings and delistings in Scandinavia?

By deploying a descriptive approach to answer the first question, we rule out that PE contributes to shrinking stock markets in Scandinavia. On the contrary, our findings indicate that PE contributes to larger stock exchanges both in terms of number of companies and market value. This is true both for the main stock lists and for all stock lists in Scandinavia. Similarly, this applies to all three Scandinavian countries individually. Moreover, we find that Sweden is the Scandinavian country with the highest PE and VC activity and that "industry and manufacturing" is the industry with the most PE- and VC-backed listings. At the same time, "IT and technology" emerge as the industry that is most attractive for PE delistings.

Using an empirical approach to answer the second question, we find that higher fundraising is associated with an increase in PE- and VC-backed listings three years later. However, we do not find statistical support for the same relationship four or five years later. Further, our results suggest that higher fundraising is associated with an increase in PE-backed delistings one year later. However, we do not find any statistical support for the same relationship two years later. Nonetheless, none of these results can be regarded as causal.

8. References

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9. Appendix

9.1 Model testing

In this chapter, we will provide a more detailed description of the model testing presented in chapter 5.2.3. We aim to clarify the problems related to any violations of underlying assumptions, and we will also present results from different tests conducted to identify any violation.

No perfect collinearity

Multicollinearity is present when strong correlations exist between explanatory variables (Woolridge, 2016). Strong correlations can lead to high standard deviations among independent variables, which in turn is a problem because it undermines the statistical significance of an independent variable. We produce a correlation table including explanatory variables of interest to look for multicollinearity. The correlations are presented in Table 10 and no strong correlations are evident. We can further test for multicollinearity by calculating the variance inflation factors (VIF) for all models, which can be seen in table 11. A rule of thumb is that values higher than five should be further investigated. The VIFs are above five for the macroeconomic factors, implying that multicollinearity is present. However, for different lags of fundraising, we observe no VIFs above five. It is noteworthy that the dummies for year-fixed effects are the main cause of high VIFs among macroeconomic factors. If we exclude yearly FEs, we see that VIFs decrease to almost one for the macroeconomic factors. In summary, we will assume that the assumption of no perfect collinearity holds.

Table 10: Correlation matrix

	10-year	Volatility	Return	Fundt1	Fundt2	Fundt3	Fundt4	Fundt5
10-year	1							
Volatility	-0.25	1						
Return	-0.05	-0.09	1					
Fundt1	-0.05	0.19	-0.03	1				
Fundt2	-0.01	0.05	-0.12	-0.07	1			

Fundt3	-0.13	0.33	0.02	0.38	-0.05	1		
Fundt4	-0.03	-0.11	0.00	0.07	0.16	-0.05	1	
Fundt5	-0.13	-0.09	-0.00	0.02	0.05	0.17	-0.10	1

Table 10 represents correlations between independent variables to test for multicollinearity. The correlation between the yield on the government bond and volatility is -0.25. The strongest correlation we observe is thus relatively low. We observe no strong correlations between any of our independent variables of interest.

Table 11: VIFs- Variance inflation factors

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
10-year	16.11	16.11	16.13	16.13	16.47	16.47	16.54	15.96
log (volatility)	7.57	7.57	7.59	7.59	7.56	7.56	7.55	7.68
Return	5.00	5.00	5.45	5.45	5.03	5.03	5.14	5.01
Fund (t-1)	-	-	-	-	-	-	1.44	-
Fund (t-2)	-	-	-	-	-	-	-	1.52
Fund (t-3)	1.46	1.46	-	-	-	-	-	-
Fund (t-4)	-	-	1.70	1.70	-	-	-	-
Fund (t-5)	-	-	-	-	1.62	1.62	-	-
Year=2006	-	-	-	-	-	-	-	-
Year=2007	2.85	2.85	2.91	2.91	2.86	2.86	2.87	2.92
Year=2008	5.53	5.53	6.23	6.23	5.54	5.54	5.68	5.68
Year=2009	2.13	2.13	2.03	2.03	2.06	2.06	2.10	2.03
Year=2010	2.90	2.90	3.01	3.01	2.90	2.90	2.95	3.21
Year=2011	5.68	5.68	5.90	5.90	5.69	5.69	5.93	5.63
Year=2012	7.57	7.57	7.60	7.60	7.59	7.59	7.71	7.57
Year=2013	4.79	4.79	4.84	4.84	4.82	4.82	4.90	4.77
Year=2013	9.64	9.64	9.78	9.78	9.87	9.87	9.78	9.59
Year=2015	7.92	7.92	8.01	8.01	8.00	8.00	7.94	7.84
Year=2015	7.60	7.60	8.03	8.03	7.72	7.72	8.02	7.62
Year=2017	6.51	6.51	6.55	6.55	6.72	6.72	6.71	6.52
Year=2018	8.67	8.67	8.69	8.69	8.61	8.61	8.73	8.58
Year=2019	8.69	8.69	8.91	8.91	8.66	8.66	9.12	8.65
Year=2020	7.18	7.18	7.41	7.41	7.41	7.41	7.29	7.34

Table 11 represents the variance inflation factors.

Zero conditional mean

The zero conditional mean assumption states that the expected value of the error term u must be equal to zero (Woolridge, 2016). In other words:

$$E(u|x_1, x_2, \dots x_k) = 0.$$

This assumption is hard to satisfy because we cannot be confident that we included all potential drivers of listings and delistings. If any omitted variables correlate with one or several independent variables, the zero conditional mean assumption fails. If the assumption holds, we can say that we have exogenous explanatory variables. If the assumption is violated due to any correlation between u and x_k, we typically say that we have endogenous explanatory variables and thereby an endogeneity problem. It is more likely that the latter case relates to our model. Since there are no formal tests that can identify a violation, we must be very cautious about causal interpretations of our estimators.

Normality

The sixth assumption requires normally distributed residuals. If this holds, the average value of the error term is 0. Violation of this assumption does not affect the efficiency of our regression models, but it is necessary for the calculation and interpretations of our p-values (Woolridge, 2016). Since the sample size is relatively small, we need to consider the normality assumption as we do not automatically get normality from a high number of observations. We test for normality based on one test for skewness, one for kurtosis, and a joint test-statistic combining these tests. Test results are presented in table 12 suggesting that the assumption is violated for models 1 to 6 and not violated for models 7 and 8. We also see that the curtosis is the main cause of non-normality in models 1 to 6. In figure 9 below we visualize the normality for model 3 and 7 respectively. We leave out the other models from visualization as they only provide marginal and not-visible changes in distributions. From the Kernel density and residual plot, we see that the residuals seem relatively close to being normally distributed. These findings suggest that we do not have perfectly distributed residuals, but the deviations are likely to have limited effect on our results.

Table 12: Joint test for normally distributed residuals

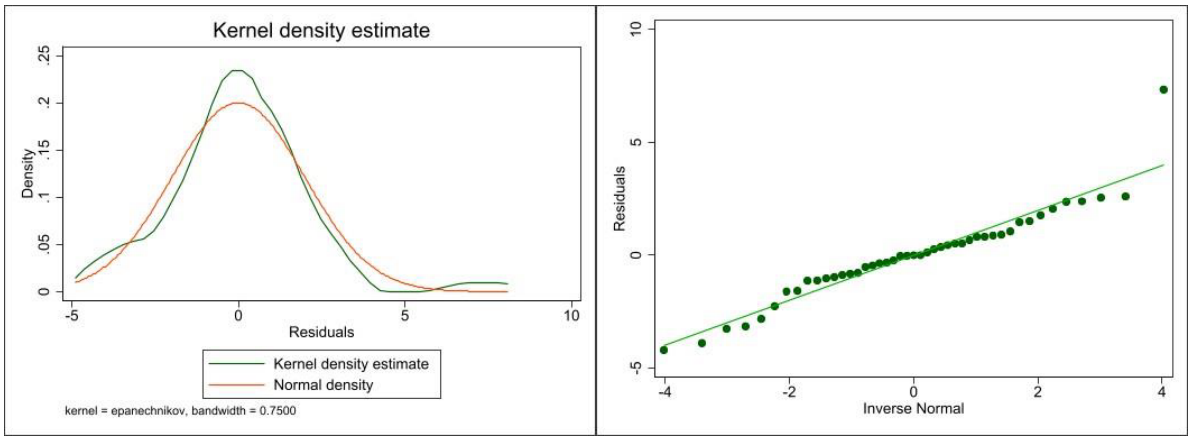
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pr Skewness	0.013	0.010	0.050	0.020	0.048	0.010	0.157	0.170
Pr Kurtosis	0.001	0.003	0.006	0.011	0.005	0.005	0.832	0.890

Joint test	0.001	0.002	0.008	0.007	0.007	0.003	0.330	0.378
Normality	No	No	No	No	No	No	Yes	Yes

Table 12 represents test results for normality under the null hypothesis that residuals are normally distributed. The joint test is a combination of the skewness and kurtosis test.

Figure 8: Kernel density and residual plots

PE listings - Model 3 (Representative for models 1, 2, 4, 5 and 6.)



PE delistings - Model 7 (Representative for model 8)

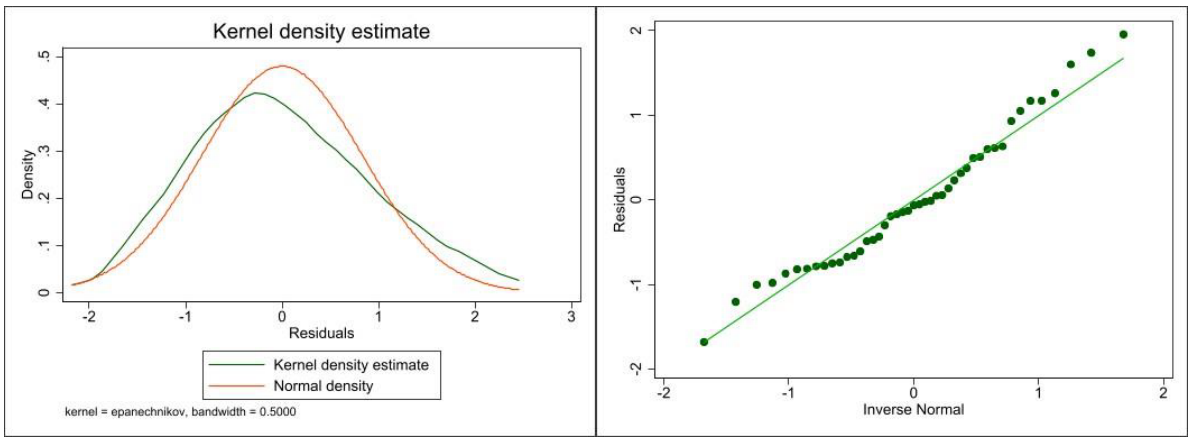


Figure 8 presents kernel density and residual plots representative for all regression models.

Homoskedasticity

Heteroskedasticity is present when the variance of the error term is not constant (Woolridge, 2016). A model that involves this concept can cause challenges when it comes to inference because of invalidated standard errors. Consequently, one cannot trust the test statistics if this is violated. We apply a Breusch-Pagan/Cook-Weisberg test to examine whether the assumption about homoskedasticity is violated. The results suggest that heteroskedasticity is present in all our models. We will therefore apply robust standard errors to address the problem.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of PE listings and PE delistings

Table 13: Testing for heteroskedasticity

	Chi 2	P-value
PE listings funding t-5	24.82	0
PE listings funding t-4	25.81	0
PE listings funding t-3	25.51	0
PE delistings funding t-1	3.92	0.04
PE delistings funding t-2	3.92	0.04

Table 13 presents test results from the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. PE listings funding t-5 represents the regression model that measures the relationship between fundraising and PE listings five years later. Due to the marginal differences between PE listings and PE and VC listings combined, we only run tests for models including PE listings.

Linearity in parameters

The linearity in parameters assumption is not that strict as it allows for y and independent variables to be arbitrary functions of the underlying variables of interest, such as natural logarithms and squares (Woolridge, 2016). A relevant example from this thesis is that we log-transformed the volatility variable. A violation would involve transformations of our estimated parameters $\beta_0, \beta_1 \dots, \beta_k$ which is not the case. The assumption is therefore satisfied.

Random sampling

A common intuition is that a large sample size provides more accurate sample estimates because it is closer to the population. It can be discussed that our population consist of all companies in Scandinavia. However, we are only looking at how fundraising is affecting PE- and VC-backed (de)listings in Scandinavia in our model. Hence, we do not use or compare this to other companies. Since our data covers all PE and VC listings and delistings, the sample should equal the population of interest. Any violation would involve that we interpret the population differently, like all company listings or different time intervals. We emphasize that our analysis is limited to Scandinavia from 2006 to 2020, implying that the random sampling assumption is satisfied within the limits of this analysis.

9.2 Detailed listing data

Table 14: Scandinavia by number – main lists

Year	PE listings	PE delistings	VC listings	VC delistings	Total listings	Total delistings
2006	10	5	3	0	70	50
2007	8	1	0	0	60	33
2008	0	4	1	0	21	55
2009	0	4	1	0	9	38
2010	6	3	1	0	29	37
2011	3	2	0	0	17	32
2012	1	3	1	0	13	31
2013	2	0	1	0	17	35
2014	12	3	1	0	27	34
2015	13	3	2	0	32	23
2016	10	2	3	0	26	23
2017	14	3	4	0	36	20
2018	7	3	2	0	28	26
2019	3	2	2	0	21	19
2020	7	3	1	0	28	28

Table 14 presents the number of total new listed and delisted companies on the main list in Sweden, Denmark and Norway per year from 2006 to 2020. In addition, the table presents the number of new listings and delistings that were backed by PE and VC on the main lists during the same time period.

Table 15: Scandinavia by market capitalization – main lists

Year	Total listings	Total delistings	PE & VC listings	PE & VC delistings
2006	142 172	168 235	8 979	48 141
2007	104 717	867 493	15 190	1 850
2008	27 817	223 388	608	11 342
2009	7 576	35 373	3 246	740
2010	182 370	42 053	109 026	6 505
2011	56 665	70 544	31 861	694
2012	12 842	58 968	995	2 764
2013	43 554	140 801	5 974	-
2014	136 892	48 750	90 207	2 017
2015	169 137	30 397	92 553	10 180
2016	279 345	214 407	218 645	10 412
2017	273 484	27 133	57 758	1 177
2018	214 971	256 736	42 486	10 967
2019	369 681	64 342	10 496	36 216
2020	139 204	131 149	72 113	7 549

Table 15 presents the total market capitalization of the new listed and delisted companies on the main list in Sweden, Denmark and Norway per year from 2006 to 2020. In addition, the table presents the market capitalization of the new listed and delisted companies that were backed by PE and VC on the main lists during the same time period.

Table 16: Scandinavia by number – all lists

Year	PE listings	PE delistings	VC listings	VC delistings	Total listings	Total delistings
2006	10	5	3	0	70	49
2007	8	1	0	0	60	32
2008	0	4	1	0	31	56
2009	0	4	1	0	11	46
2010	7	4	2	0	39	40
2011	4	2	0	0	25	35
2012	1	3	1	0	11	33
2013	2	0	1	0	21	40
2014	12	5	5	0	78	46
2015	14	3	9	0	88	43
2016	11	2	15	0	89	31
2017	16	3	14	0	119	31
2018	9	3	5	0	77	37
2019	8	2	6	0	64	29
2020	14	3	14	0	113	40

Table 16 presents the number of total new listed and delisted companies on all lists in Sweden, Denmark and Norway per year from 2006 to 2020. In addition, the table represents the number of new listings and delistings that were backed by PE and VC on all lists during the same time period.

Table 17: Sweden by number – main list

Year	PE listings	PE delistings	VC listings	VC delistings	Total listings	Total delistings
2006	6	3	0	0	22	21
2007	4	1	0	0	13	12
2008	0	2	1	0	9	22
2009	0	2	0	0	7	14
2010	2	2	0	0	14	14
2011	2	1	0	0	11	10
2012	0	2	1	0	6	7
2013	1	0	0	0	7	8
2014	6	1	0	0	13	8
2015	12	0	1	0	19	9
2016	6	1	3	0	15	8

2017	7	3	3	0	17	4
2018	3	1	1	0	11	11
2019	1	1	2	0	11	9
2020	5	3	0	0	18	16

Table 17 presents number of total new listed and delisted companies on the main list in Sweden per year from 2006 to 2020. In addition, the table presents the number of new listings and delistings that were backed by PE and VC on the main list during the same time period.

Table 18: Sweden by market capitalization – main list

Year	Total listings	Total delistings	PE & VC listings	PE & VC delistings
2006	16 236	121 560	-	43 341
2007	20 084	777 635	4 096	1 850
2008	7 660	77 415	608	9 838
2009	4 042	15 257	-	344
2010	15 016	11 100	2 838	6 021
2011	17 180	15 082	2 154	242
2012	2 196	12 259	383	1 939
2013	14 064	101 415	355	-
2014	54 547	7 334	28 662	838
2015	101 935	5 955	83 584	-
2016	75 105	68 582	51 198	9 017
2017	210 378	1 339	35 591	1 177
2018	124 239	134 480	6 595	5 586
2019	260 302	43 850	4 738	22 183
2020	74 259	101 893	45 357	7 549

Table 18 presents the total market capitalization of the new listed and delisted companies on the main list in Sweden per year from 2006 to 2020. In addition, the table presents the market capitalization of the listed and delisted companies that were backed by PE and VC on the main lists during the same time period.

Table 19: Denmark by number – main list

Year	PE listings	PE delistings	VC listings	VC delistings	Total listings	Total delistings
2006	0	0	2	0	16	7
2007	0	0	0	0	18	3
2008	0	1	0	0	6	10
2009	0	0	1	0	2	8
2010	3	0	1	0	5	10
2011	1	0	0	0	2	10
2012	0	0	0	0	1	13

2013	1	0	0	0	2	11
2014	2	0	1	0	4	13
2015	0	0	0	0	2	3
2016	3	1	0	0	4	12
2017	1	0	1	0	4	5
2018	1	0	0	0	3	6
2019	0	0	0	0	2	4
2020	1	0	0	0	3	5

Table 19 presents the number of total new listed and delisted companies on the main list in Denmark per year from 2006 to 2020. In addition, the table presents the number of new listings and delistings that were backed by PE and VC on the main list during the same time period.

Table 20: Denmark by market capitalization – main list

Year	Total listings	Total delistings	PE & VC listings	PE & VC delistings
2006	13 615	-	2 232	-
2007	15 995	30 961	-	-
2008	1 869	88 772	-	647
2009	3 535	4 556	3 246	-
2010	104 278	1 827	103 781	-
2011	30 824	33 688	29 707	-
2012	156	5 293	-	-
2013	-	-	-	-
2014	48 466	6 022	48 246	-
2015	7 705	3 772	-	-
2016	177 794	10 266	164 523	1 395
2017	15 865	322	2 861	-
2018	15 843	100 666	14 921	-
2019	2 654	2 230	-	-
2020	16 135	12 100	3 480	-

Table 20 presents the total market capitalization of the new listed and delisted companies on the main list in Denmark per year from 2006 to 2020. In addition, the table presents the market capitalization of the new listed and delisted companies that were backed by PE and VC on the main lists during the same time period.

Table 21: Norway by number – main list

Year	PE listings	PE delistings	VC listings	VC delistings	Total listings	Total delistings
2006	4	2	1	0	32	22
2007	4	0	0	0	29	18
2008	0	1	0	0	6	23

2009	0	2	0	0	0	16
2010	1	1	0	0	10	13
2011	0	1	0	0	4	12
2012	1	1	0	0	6	11
2013	0	0	1	0	8	16
2014	4	2	0	0	10	13
2015	1	3	1	0	11	11
2016	1	0	0	0	7	3
2017	6	0	0	0	15	11
2018	3	2	1	0	14	9
2019	2	1	0	0	8	6
2020	1	0	1	0	7	7

Table 21 presents the number of total new listed and delisted companies on the main list in Norway per year from 2006 to 2020. In addition, the table presents the number of new listings and delistings that were backed by PE and VC on the main list during the same time period.

Table 22: Norway by market capitalization – main list

Year	Total listings	Total delistings	PE & VC listings	PE & VC delistings
2006	112 321	46 675	6 746	4 800
2007	68 638	58 896	16 424	-
2008	18 288	57 201	-	156
2009	-	15 560	-	396
2010	63 076	29 126	2 407	483
2011	8 661	21 774	-	452
2012	10 490	41 416	612	824
2013	24 232	21 397	482	-
2014	33 879	35 393	13 298	1 179
2015	59 497	20 670	8 969	10 180
2016	26 446	135 560	2 925	-
2017	47 241	25 472	19 306	-
2018	74 889	21 590	20 971	5 380
2019	106 725	18 262	5 758	14 034
2020	48 810	17 157	23 277	-

Table 22 presents the total market capitalization of the new listed and delisted companies on the main list in Norway per year from 2006 to 2020. In addition, the table presents the market capitalization of the new listed and delisted companies that were backed by PE and VC on the main lists during the same time period.