Norwegian School of Economics
Bergen, Fall 2018

What Determines Private Equity Holding Periods?

An Empirical Analysis of Nordic Private Equity Investments

Maren Kamlund & Oda Elisabeth Knudsen

Supervisor: Carsten Bienz

Master Thesis

Finance

NORWEGIAN SCHOOL OF ECONOMICS

This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Please note that neither the institution nor the examiners are responsible − through the approval of this thesis − for the theories and methods used, or results and conclusions drawn in this work.

Abstract

This thesis seeks to identify what determines private equity holding periods in the Nordics. We examine whether i) portfolio company characteristics, ii) PE firm and PE fund characteristics and iii) market level conditions have an impact on the exit timing decision. The analysis is based on a sample of 343 private equity transactions in Finland, Norway and Sweden between 2000 and 2016. We find that market variables play a significant role in driving holding periods. The results suggest that investments are held shorter in times with high activity in the IPO market, which indicates that PE firms take advantage of "open windows" in the IPO market by taking their companies public in times with optimistic investors and higher valuations. Furthermore, evidence is found that an abundant amount of dry powder in the market accelerates the pace of exit. In line with what we expected, the analysis also shows evidence that increased competition among PE firms at the time of entry decreases the chances of a fast exit. Lastly, the findings suggest that portfolio companies with slower revenue growth are held longer.

Preface

This thesis concludes our Master of Science in Finance at the Norwegian School of Economics.

Working with this master thesis have given us the opportunity to gain insight into how potential determinans affect private equity holding periods. The work has been challenging and time-consuming, yet highly interesting and educational. Further, it has been rewarding to achieve a more thourough understanding of the private equity industry, as we expect that the activity in the Nordic PE market will continue to increase.

We would like to express our gratitude to our supervisor Associate Professor Carsten Bienz for valuable inputs and supervision through the writing process. Your engagement in our work and your constructive feedback have been an important contribution for the final result of this thesis.

Table of Contents

List of Figures

List of Tables

1. Introduction

A negative correlation coefficient of -0.5 between private equity holding periods and equity IRR implies that PE firms prefer shorter to longer holding periods (Valkama et al., 2013). Nevertheless, later research within buyout duration have reported that the average holding period have lengthened (Jenkinson and Sousa (2015);Bain & Company (2018)). Following this, we ask the question: what determines private equity holding periods?

Previous studies[1] show evidence that holding periods are dependent on characteristics of the portfolio company, the PE firm and fund and, lastly, market conditions. However, the research mainly concern global and European investments, and it is thus not clear to what extent the findings can be applied to the Nordic PE market. For instance, the Nordic region has been more sheltered against problems in credit markets following the financial crisis, which gives reason to believe that the region differs from the global PE market at least in terms of market conditions. Following this, we examine PE investments in the Nordics to uncover characteristics of this market. We aim to achieve an understanding of the determinants of holding periods within the following sets of factors: i) portfolio company characteristics, ii) PE firm- and fund characteristics and iii) market level conditions.

First, we seek to uncover whether the achievement of an operational plan of the portfolio company drives the holding period. During the holding period of an investment, the PE firm adds value to the portfolio company with the ambition to achieve a return at the date of exit. Gompers et al. (2015) find that the most important source of added value to the portfolio company is increasing revenue. In fact, sales growth is reported to contribute half of operational value during the ownership (EY, 2015). Based on this notion, we test the effect of revenue growth on the holding period. In terms of PE firm- and fund characteristics and their role in investment duration, previous research reveal contradicting suggestions. Ljungqvist and Richardson (2008) argues, in line with Gompers (1996), that newly established PE firms divest their portfolio companies early to signal its ability and attract future investors. Giot et al. (2014), on the other hand, argue that the exit decision rather is determined by experience. Motivated by these ambiguous

[1]See e.g. Gompers et al. (2015), Jenkinson and Sousa (2015), (Giot et al., 2014), (Gompers, 1996).

perceptions, the effect from fund characteristics are investigated.

In addition to characteristics of the portfolio company and PE firm and fund, the exit decision is presumably dependent on market level conditions. Gompers et al. (2015) report that increase in competition may indicate entries with higher valuation multiples. It can thus be assumed that investments made under these circumstances are overvalued and presumably takes longer to sell. Following this, we test whether high competition correlates with investment duration. Further, Gompers et al. (2015) also suggest that credit market conditions may influence the exit decision. For instance, a tightening of credit availability presumably makes it harder for potential buyers to receive bank financing. Thus, one would expect that in times with tightening of credit, investments are held longer.

Lastly, empirical studies highlight the importance of market conditions on holding periods. Lower IPO activity can be assumed to lengthen the time to exit because of the important role equity market conditions play in the decision to go public Ritter (2002). The activity in the M&A market is further likely to impact exit decisions in cases of sales to strategic buyers. Consequently, we test the effect of activity in the M&A and IPO market.

In order to study potential determinants of holding periods, we constructed a data set of 343 private equity deals in Nordic countries[2], with an investment date between 2000 and 2016.[3] We first examine how changes in variables affect holding periods, through the likelihood of an exit to occur, by conducting a survival regression analysis[4]. This enables us to utilize information also on investments with an unobserved holding period, that is, investments that are current holdings. Additionally, the method allows variables to be time-varying. To deploy the survival regressions, a panel data set is created in such way that each of the 343 deals is assigned a row every year it is observed in the sample period. For each deal, data is collected on i) financial information on the portfolio company at the date of entry and exit of the PE investment, ii) characteristics of the PE firm and

[2]Besides Denmark and Iceland.

[3]In this thesis, private equity deals are solely referred to as buyout deals, i.e. investments in established companies. Data is extracted from a variety of sources, described in detail in Section 5.1.

[4]Cox´ proportional hazard model.

fund and, lastly, iii) market level conditions. The latter contains variables that we allow to vary with time, so that we are able to investigate how changes in these variables during the holding period impact the PE firms´ exit timing decision. We also deploy an ordered probit regression with sample selection to study closer how the actual length of HP tends to vary with changes in the variables. Both models control for industry- and country effects to isolate the effect of the arrays of factors.

The analysis aims to assess five formulated hypotheses in order to explain holding periods. We find evidence of the first hypothesis that *portfolio companies with slower revenue growth are held longer*. In the study of our second hypothesis, we would expect to find that *funds that are less likely to raise a follow-on fund hold their investments longer*. However, no statistical evidence is found.

Further, the results suggest that market level variables play a significant role in driving private equity holding periods. In the study of market level variables, we find support of the third hypothesis that *investments made in times with more competition are held longer.* Additionally, an abundant amount of dry powder in the market tends to accelerate the pace of exit. Further, the analysis provides no evidence of the fourth hypothesis that *in times with tightening of credit, investments are held longer*. Lastly, our results suggests that increased activity in the IPO market shortens holding periods. This indicates that PE firms are likely to take advantage of "open windows" in the market in times with high market valuations. The effect is not significant in case of M&A activity. Hence, support is partly found of the fifth hypothesis that *in times with lower activity in the M&A and IPO market, investments are held longer*.

The remainder of the thesis is structured as follows: Section 2 introduces the characteristics of the private equity model and the Nordic private equity market. Additionally, related literature on our hypothesis is presented before the hypothesis are examined in Section 3. Then follows, in Section 4, a description of the methodology used. Section 5 includes how our data sample is selected as well as a presentation of the variables used in our empirical analysis. The results from the analysis are presented in Section 6, whilst Section 7 provides a conclusion.

2. Literature Review & Empirical Evidence

2.1. Private Equity

2.1.1 The Private Equity Model

Private equity is predominantly about making returns through generating capital gains by selling an investment when it is made more valuable (Gilligan and Wright, 2014). Briefly explained, the idea is to buy (unquoted) businesses[1], add value to the businesses through active management[2] and eventually sell the businesses to realize the created value (Gilligan and Wright, 2014). The length of this process for an individual portfolio company, the time from entry to exit, defines the holding period (HP) of that investment.

Private equity funds have a limited life, which implies that there is a pre-agreed date on which they stop investing in new companies and subsequently be liquidated (Gilligan and Wright, 2014). A lifetime of ten years is common, with the possibility of an extension period of two years. The first stage of the lifetime typically takes 6 to 18 months and involves determining the terms of the fund, attracting investors and raising capital for the fund (Cendrowski et al., 2012). According to BVCA (2017), time spent on fundraising in the Nordic region has varied between 14 to 17 months the last couple of years, with an average fundraising period of 17 months in 2017.

The investment period can be viewed as the second stage in the private equity model and includes the phase when the fund invests the capital committed by investors. Jenkinson and Sousa (2015) report that most of the initial investments for a fund is made within the first two years into the life of the fund, whereas the investment period normally lasts from 3 to 5 years according to Ljungqvist and Richardson (2008). The length depends on the private equity firm´s identification and screening of investment opportunities, in addition to negotiations with banks to finance the transaction. When investments to the

[1]This thesis is limited to study "buyout" investments, which refer to purchases of established businesses in which the PE firm typically takes a major equity stake in. The contrary is "venture capital" investments, where the PE firm invests in early-stage businesses.

[2]The PE firm is typically involved in setting and monitoring the implementation of strategy in order to create value, e.g. through board representation.

portfolio companies eventually are made, the capital is called from the investors. Capital which is yet to be invested is referred to as "dry powder", and is reported by Ljungqvist and Richardson (2008) to be almost 35% of committed capital. In the Nordic market, the amount of dry powder has increased steadily the last couple of years, and was reported to be 22 billion dollars in 2017, where Sweden accounts for over 50% (BVCA, 2017).

The third stage of the PE fund´s lifecycle constitutes what in this thesis is referred to as the holding period of the fund´s investments. From the entry date, when the initial investment is made, the PE firm aims to actively involve and increase the value of the portfolio company through operational-, financial-, and governance engineering (Kaplan, 2009). The goal is to create value for both the portfolio company and investors before selling the company at the exit date. Divesting the portfolio companies refers to the last stage of the fund´s lifecycle, and can be done through public sales (IPOs), trade sales to an industrial buyer and secondary buyouts (SBOs) to other PE firms[3]. Existing literature on private equity report some differences in the length of holding periods (see e.g. Jenkinson and Sousa (2015), Gompers et al. (2015)), however, on average a portfolio company is typically held for around five years. Holding periods tend to vary with exit routes, and a study by Jenkinson and Sousa (2015) on European private equity deals reports an average HP of 4.4 years through SBOs, compared to IPO exits with an average HP of 3.7 years. The timing of exit can be outlined before the initial investment, however, the influence of several factors[4] may either expedite or delay the divestment.

2.1.2 The Nordic Private Equity Market

Most Private Equity research are based on American empirical data or theories and tested in the US market (Robert Spliid, 2013). In the article "Is the Nordic Market different?", Spliid compares the Nordic Private Equity market, defined here as Norway, Sweden, Denmark and Finland, with the US Private Equity Market. In the article, he finds that even though both markets are successful they are working in very different environments. Robert Spliid (2013) finds that there are differences in management's motivation factors.

[3]Portfolio companies may also go bankrupt prior to the planned exit and leave the PE firm´s portfolio of that reason.

[4]E.g. achievement of performance targets, finding the preferred buyer and market conditions.

Further, he states that the Nordic Market contains of a smaller investment universe (also in relative terms) and that the Nordic Markets are less developed. Fundraising is also mentioned to be tougher due to fewer investors and credit sources. Lastly, Spliid states that the government in the Nordic countries emphasize more control of the market and works to reduce the tax benefits in the industry, which is not the case for the American market. Even though the author finds significant differences between the two markets, he concludes that the American PE research is relevant for the Nordic market. To give the full picture, however, the research should include Nordic data.

Robert Spliid (2013) also discusses whether the Nordic countries can be viewed as one market. The author finds that the countries are relatively similar with regard to institutions and government, and that they share important similarities like high tax-regime, low "power distance" and highly educated workforce. Hence, Robert Spliid (2013) concludes that it is reasonable to view the region as one PE market.

Historically, Nordic buyouts have been characterized by large domestic firms in traditional industries that required restructuring (Wrigth et al., 1992). However, the activity and performance in the Nordic Private Equity market have increased significantly since the 90s and grown to be one of the most important investor groups for the region (Robert Spliid, 2013). Fundraising has grown steadily in the Nordic region since 2012, with the exception of a significant decrease between 2015 and 2016. The largest investors in buyout funds in the Nordic market include Pension Funds (20% of total raised capital), Private Sector/Pension Funds (17%) and Family Office (13%) BVCA (2017).

In terms of performance, the Nordic private equity market is one of the most successful and active in Europe BVCA (2016). A critical factor for the region´s historical attractiveness and strong growth is, according to BerchWood Partners (2013), its consistent outperformance of peer markets like the US and Europe. Some of the most respected Nordic firms include CapMan Norvestor Equity, EQT Partners and HiTecVision. The growth in the PE industry have resulted in an increased number of non-domestic investors. In 2013 BerchWood Partners (2013) reports that 75 percent of the invested capital come from non-domestic investors.

2.2. Related Literature on the Hypotheses

In this section, we present an overview of related literature and empirical evidence in connection to our hypotheses. Since our hypotheses concern the effect of potential determinants on private equity holding periods, the following review will include literature on this topic in particular.

2.2.1 Portfolio company characteristics

Kaplan (2009) suggests that during the PE ownership, value can be added to the portfolio company in three main ways, namely through financial engineering, governance engineering and operational engineering[5]. The most important source of added value to the portfolio company is reported by Gompers et al. (2015) to be increasing revenue, which fit under operational engineering. A study by ErnstYoung (2016) also reveals that half of the operational value created during the holding period of a private equity investment is attributable to sales growth. Improved sales growth is reported to be done typically through development of industry- and operating expertise, for instance by the completion of market studies to develop a strategy that will improve price, volume, and product mix (EY, 2015).

Further, in their study of PE firms´exit decision, Gompers et al. (2015) find that achieving the expected operational plan plays an important role in the timing of divestment. Hence, when reviewing the added value to the portfolio company by the end of the investment holding period, investors evaluate the achieved operational performance of the company and whether this has improved. A typical pitfall in the implementation of an operational improvement program is not to involve the operational team early in the process. Such issue can arise when the PE firm fails to establish a dedicated operational team, so that the portfolio company lack support in achieving the value targets (EY, 2015). Given the importance of operational improvement in the exit timing decision, such pitfalls can prevent an investment from being exited as planned.

Besides adding value by improving the portfolio company´s operational performance

[5]We have limit our study to include the latter, in which PE firms place a high emphasize on.

through an organic strategy, growth can be achieved inorganically. The latter refers to a "buy-and-build" strategy, where the PE firm starts with the portfolio company (named "platform company") and performs add-on acquisitions. Hammer (2018) document the popularity of buy-and-build strategies among PE firms, and report that during PE ownership every fourth buyout conducts add-on acquisitions. In a later study, Hammer (2018) investigates the effect of this strategy on private equity holding periods and finds that holding periods increase by 20% when the portfolio company is used as a platform company in a buy-and-build strategy.

2.2.2 PE firm- and fund characteristics

A model is developed by Ljungqvist and Richardson (2008) to empirically study the behavior of private equity funds. They link the PE funds´ investment behavior and the returns they earn on their buyouts to changes in demand for private equity, as well as to funds´ ability to influence their talent in the market. By using a dataset of more than 200 buyout funds that invested in more than 2000 targets over the last two decades, they are able to characterize each buyout fund´s investment behavior. They find that younger funds invest in riskier buyouts, primarily to build a reputation through establishing a track record. Further, funds tend to become more conservative after good performance.

The finding made by Ljungqvist and Richardson (2008) that reputational concerns have an impact on PE funds´ exit decisions refers to the theory developed by Gompers (1996), namely the "grandstanding theory". The hypothesis, in particular in the case of IPO exits for venture capitalists, suggests that newly established PE firms are willing to take risks in order to build a reputation. In practice, this implies that the fund manager early divests its investments to receive attention among potential investors and signal its ability. In contrast to the findings of Gompers (1996), Giot et al. (2014) suggest that the timing of exit is linked to the PE firm´s experience rather than motives of reputation. The study reports that newly established PE firms are slower in investing capital, and have less early exits than more experienced funds. According to the authors, an explanation could be that the younger firms have a lack of experience in terms of for instance finding the best investments.

The signaling effect highlighted by Gompers (1996) is supported by Schmidt and Steffen (2010), who find that the PE firms make sure to write-off investments very quickly if they do not seem to meet performance targets. Besides this, they argue that also market conditions play a role in the exit timing decision.

2.2.3 Market Conditions

In addition to characteristics of the portfolio company and the PE firm and fund, the exit decision (and hence the length of the holding period) is dependent on factors more outside the fund manager´s control. Empirical evidence suggests that a PE firm´s exit timing decision is linked to credit market conditions (see e.g. Ljungqvist and Richardson (2008); Jenkinson and Sousa (2015); Gompers et al. (2015);Axelson (2013)). Ljungqvist and Richardson (2008) report that established funds accelerate the exits of their investments and earn higher returns when credit market conditions loosen, whereas investment behavior is less sensitive to market conditions in the case of first-time funds. The link between loose credit market conditions and exits is explained by the fact that as more cheap debt is available, potential buyers are more likely to get bank financing to finance the transaction. This reasoning is supported by findings by Ljungqvist (2003), in which suggest that as more expensive high-yield debt is, the more delayed are exits.

Cheap debt is also a source of higher competition among PE firms, and Ljungqvist and Richardson (2008) identify competition among participants in the buyout market as an important driver of the timing of investment decisions. In addition to cheap debt, higher competition can be a result of PE firms sitting on a large amount of cash that eventually will be invested in the market. Market timing theories suggests that improved investment opportunities and ease in competition for deals are positively correlated with the speed of exit (Ljungqvist and Richardson, 2008). Furthermore, a study done by Gompers et al. (2015) investigate to what extent PE firms time the M&A- and IPO markets in order to succeed with an exit, and find that fundamentals, such as the operational performance of the portfolio company, and capital market conditions are equally weighted in the exit decision. Ritter (2002) emphasize equity market conditions as an important factor to go public, where investors view attractive pricing as an opportunity to take companies public through an IPO.

3. Main Hypotheses

3.1. Portfolio company characteristics

Our first hypothesis builds on the notion that portfolio company specific performance is a driver of exit timing and hence potentially influences the holding period. Gompers et al. (2015) report that increasing operational performance, in particular revenue, is the most important source of added value by PE firms to their portfolio companies. Given the importance of achieving an expected operational plan during the holding period, it is reasonable to assume that PE firms will not exit an investment before the performance target is met. On the other hand, one could argue that PE firms would sell their investments early regardless of value creation as long as the price is good and high returns are obtainable. In order to tell whether the revenue growth of the portfolio company does have an impact on holding period, we form the following hypothesis:

H1: Portfolio companies with slower revenue growth are held longer.

3.2. PE firm- and fund characteristics

Theories suggest that holding periods vary with the ability and performance of the asset manager. A study done by Giot et al. (2014) reports findings that younger PE firms hold their investments longer due to lack of experience. Gompers (1996), on the other hand, argues that newly established firms have a need to signal to investors their ability, and do so by exiting their investments faster[1] to achieve a higher internal rate of return. Based on this, we suspect that holding periods are dependent not only on the PE firm´s experience, but also on whether the PE firm considers it likely to raise a follow-on fund. It can be assumed that GPs who seek to raise a second fund strive to accelerate the pace of exits to build a reputation, whereas the opposite may be the case for PE firms raising their last fund. In case of the latter, the firms can enjoy fees by holding on to their investments if a good reputation is of less importance[2]. We test the following:

[1]Especially in the case of venture capital investments taken public through IPOs.

[2]The rationale is consistent with the theory of Robinson and Sensoy (2013) that GPs hold on to investments rather than liquidating them, when the basis of the management fee shifts to net invested capital (cost basis of all investments less cost basis of realized investments).

H2: Funds that are less likely to raise a follow-on fund hold their investments longer.

3.3. Market Conditions

The increase in capital under management implies more competition for deals and less ability to buy companies at an attractive price Gompers et al. (2015). Hence, when competition for deals is stronger there are presumably more entries with higher valuation multiples. We expect it to be more challenging for PE firms to achieve the desired value at exit of these entries compared to those which are fairly priced. Additionally, McKinsey & Company (2018) suggests that GPs, in times with increasing committed capital, are pressured by investors to deploy their capital. The latter presumably results in managers doing deals in which they might not otherwise do, which we hypothesize to be targets that take longer to sell. Motivated by these arguments, the following hypothesis is investigated:

H3.1: Investments made in times with more competition are held longer.

Gompers et al. (2015) report that capital market conditions are the most important factors to be considered by PE firms in the exit timing decision of investments (after portfolio company specific characteristics). It can be assumed, for instance, that PE firms are able to exit their investments faster in times when activity in the M&A and IPO market is high and credit is easy available. The opposite can be expected if market conditions worsen. For instance, a tightening of credit availability, as was the case after the financial crisis (Ivashina and Scharfstein, 2010), presumably implies less potential buyers as they may not be able to get bank financing for deals. Further, in times with low activity in the IPO market, holding periods can be expected to lengthen based on the notion that equity market conditions are seen as the most important factor to consider for firms in decision to go public (Ritter, 2002). This reasoning leads to our last two hypotheses:

H3.2: In times with tightening of credit, investments are held longer.

H3.3: In times with lower activity in the M&A and IPO market, investments are held longer.

4. Empirical Methodology

The main purpose of this thesis is to investigate what determines private equity holding periods by testing the effect of different variables. The underlying data include both exited and current investments and is described as time-to-event data (TTE) or survival data (Tuma and Hannan, 1979). This type of data is unique because it is not only the outcome of whether an event occurred that is interesting, but also the time to the event. In the following section we introduce a model which allows us to include both aspects.

4.1. Cox´s proportional hazard model

We use the Cox proportional hazard model to study potential determinants of the holding period, which is a model widely used in academic literature (see, e.g., Wang and Wang (2012), Arcot et al. (2015), Jenkinson and Sousa (2015)). The model aims to control for censored data, in this case right-censored data, and provides unbiased survival estimates. Right-censoring occurs when 1) a subject leaves the study before an event occurs, or 2) the study ends before the event has occured. In the case of private equity, the event relates to the exit of a company[1]. Further, the model allows the use of time-varying covariates. The latter is important because changes in time-varying factors, such as the VIX index and IPO/M&A activity, during the holding period presumably affect the exit timing decision and hence the length of the holding period (for instance, a "hot" IPO market potentially accelerates the pace of exit). It is important to note that even though covariates may vary over time, the log-hazard rate is the the same across all time points (Thomas and Reyes, 2014).

The Cox proportional hazard model is a semi-parametric model[2] (Cox, 1972). It builds

[1]Hence, the case where a subject leaves the study before an actual exit typically applies to companies going bankrupt. The second case is what relates to current holdings, i.e. the company is still in the PE firm's portfolio by the end of the sample period.

[2]Semi-parametric because it includes both a non-parametric and a parametric component; the baseline hazard function $h_0(t)$ is non-parametric and does not depend on a specific distribution. It is defined as the probability of an event occurring at time t, dependent on the information that there has not been an event before t. The parametric component is comprised of the covariate vector.

on hazard (probability) rates that depend on a set of covariates (explanatory variables):

$$h(t) = h_0(t)e^{(\beta_1 X_1 + \beta_2 X_2 .. + \beta_p X_p)} \tag{4.1}$$

The main purpose is to understand how the explanatory variables impact the baseline hazard rate $h_0(t)$ (probability). The model estimates the probability that an exit occurs based on the explanatory variables included and their evolution over time. We need to create a panel of observations where every deal in our data set is assigned a row for each year the portfolio company is held and thus observed, from entry to exit. In this way, variables for market conditions are allowed to vary over the holding period of each portfolio company. The deal or company remains in the panel until an observed exit occurs (the event) or the sample period ends. The latter type of observations refer to those investments still not exited by the end of year 2017 (current holdings), defined as right-censored data. This data must be independent of the exited investments, which is true in our case.[3] It is important to include these observations in addition to those exited, as current holdings might contain valuable information on factors that have an effect on timing of exit.

The hazard model is interpreted in terms of hazard ratios. The impact of a one-unit change in an independent variable on the hazard ratio can be calculated as follows:

$$\Delta\lambda_0(t) = 100x(e^{\beta_i}) \tag{4.2}$$

A positive coefficient increases the hazard rate relative to its baseline levels, meaning that a one-unit change in the independent variable increases the probability of an exit and thus shortens the holding period. By contrast, a negative coefficient means that a one-unit change in the independent variable decreases the probability of an exit and lengthens the expected holding period.

[3]Figure 8.1 and 8.2 in Appendix confirm that also the proportional hazards assumption holds.

4.2. Heckman´s selection model

In the study of the probability of an exit to occur within different time frames, we use an ordered probit model with sample selection. Our data is subject to "sample selection bias" as the dependent variable, holding period, is observed only for exited investments. Regression in such a model of selection consists of two equations (Greene, 2003):

$$z_i^* = \boldsymbol{w}'\boldsymbol{\gamma}_i + u_i, \tag{4.3}$$

$$y_i = \boldsymbol{x}'_i\boldsymbol{\beta} + \epsilon_i. \tag{4.4}$$

, where equation 4.3 determines the sample selection and equation 4.4 is the equation of primary interest. The sample rule is that y_i (holding period) is observed only when z_i^* is greater than zero (z_i^* equals 1 if the investment is exited). In line with Greene (2013), we suppose that ϵ_i and u_i have a bivariate normal distribution with zero means and correlation ρ, and the following model applies to the observations in our sample:

$$\begin{aligned}
E[y_i \mid y_i \text{ is observed}] &= E[y_i \mid z_i^* > 0] \\
&= E[y_i \mid u_i > -\boldsymbol{w}'\boldsymbol{\gamma}_i] \\
&= \boldsymbol{x}'_i + E[\epsilon_i \mid u_i > -\boldsymbol{w}'\boldsymbol{\gamma}_i] \\
&= \boldsymbol{x}'_i + \rho\sigma_\epsilon\lambda_i(\alpha_u) \\
&= \boldsymbol{x}'_i + \beta_\lambda\lambda_i(\alpha_u) \\
\text{where } \alpha_u &= -\boldsymbol{w}'_i\boldsymbol{\gamma}/\sigma_u \text{ and } \lambda(\alpha_u) = \phi(\boldsymbol{w}'_i\boldsymbol{\gamma}/\sigma_u)/\Phi(\boldsymbol{w}'_i\boldsymbol{\gamma}/\sigma_u). \text{ So,} \\
y_i \mid z_i^* > 0 &= E[y_i \mid z_i^* > 0] + v_i \\
&= \boldsymbol{x}'_i\boldsymbol{\beta} + \beta_\gamma\gamma_i(\alpha_u) + v_i.
\end{aligned} \tag{4.5}$$

Regression using the observed data, that is, regression of holding period on its determinants using only data for investments that are exited, produces inconsistent estimates of β. Following this, Heckman´s (1979) two-step estimation procedure is used to obtain consistent estimators (Greene, 2003):

First, the probit equation by maximum likelihood is estimated to obtain estimates of γ. For each observation in the selected sample, $\hat{\lambda}_i$ is computed as $\hat{\lambda}_i = \phi(\boldsymbol{w_i'}\hat{\boldsymbol{\gamma}})/\Phi(\boldsymbol{w_i'}\hat{\boldsymbol{\gamma}})$ and $\hat{\delta}_i = \hat{\gamma}_i(\hat{\gamma}_i - \boldsymbol{w_i'}\hat{\boldsymbol{\gamma}})$.

Second, $\boldsymbol{\beta}$ and $\beta_\lambda = \rho\sigma_e$ is estimated by least squares regression of y on $\boldsymbol{x}$ and $\hat{\lambda}$. In the analysis where we deploy the ordered probit model, we aim to control for sample selection bias by running the above equations. The "heckoprobit" command in STATA allows us to estimate the second stage as an ordered probit instead of OLS. The theory of the model presented here still applies.

5. Data

A comprehensive overview of the Nordic private equity activity is needed in order to conduct the empirical analysis, and a lot of effort is put into the construction of our data set. In the following, we first describe the process of the data collection before we define the variables we make use of in our analysis.

5.1. Source and sampling

Data used in this study is collected from different sources in a step by step process. Initially, we were given access to the Argentum's Centre for Private Equity (ACPE) database, including private equity transactions in the Nordic countries[1] between 1978 and 2016. The initial sample is restricted to include only buyout backed companies, as our focus will be on Nordic buyout deals. Information on the transactions[2], to the extent it exists, is obtained from the ACPE database. Data on each deal is supplemented with collected information through a variety of sources. Manual web searches on the PE firms´web sites, as well as news reports on acquisitions and divestitures, enable us to identify entry- and exit year data for 420 deals, 151 of which are current holdings.

Accounting data[3] is limited in particular prior to year 2000. Due to the dependence of accounting data in our empirical analysis, and since most of our observations are for the years after 2000, we have limit our study to include deals with entry dates in the period 2000-2016 only. Additionally, it is difficult to find accounting information on Danish companies due to differences in the restriction of reporting. As a result, we exclude deals where the target company nation is Denmark. Consequently, our final sample contains 343 deals, 147 of which not exited by the end of 2017[4].

To collect accounting data on each deal at the time of entry and exit, we use the Bureau Van Dijk's database "Orbis". We utilize Bureau Van Dijk's ID numbers and the organization numbers on deals in our data set to match the data. To complement the data, we

[1] Besides Iceland.

[2] Including entry- and exit dates, fund characteristics and portfolio company characteristics.

[3] Operating revenue, EBITDA, EBITDA-margin and total assets

[4] We set the sample period to end December 2017, hence deals not exited within year 2017 are classified as current holdings.

obtain accounting information on Norwegian, Swedish and Finnish portfolio companies from the SNF database (NCA) and through web searches. Primarily, we collect financial records on the deals in the year before entry and exit, and secondarily in the year the entry and exit takes place. Limited access to data prevents us from having full financial information for each deal. In total we are able to obtain full accounting information on 183 deals[5].

In order to determine which of the portfolio companies that have been used as platform companies for a buy-and-build strategy, Orbis is used to select companies with recorded M&A activity during the PE ownership (linked to a PE firm and within the relevant geographical area and time horizon of our study). Among these companies, the ones that have been executing add-on acquisitions are matched with our current sample by organization number. To verify the results, each deal is closely investigated through manual web searches, including the PE firms´web sites and news articles. In our final sample, 56 deals (of 343) are identified as buy-and-build cases. We observe that these deals to a large extent comprises the observations in which we consider as extreme values in our data set. In the case of other outliers, the data points are thoroughly investigated for typos. Consequently, the current presence of extreme values in the final sample can be justified, and the observations will not be excluded from the statistical analyses.

PE fund and firm characteristics[6] for the 343 deals are collected from SDC Platinum's VentureXpert (VE) (fund size) and manual searches on the PE firms´web sites. Lastly, we collect data on the market conditions[7] over the sample period. Yearly estimates on dry powder (the difference between capital committed and capital invested) are collected from BVCA (2017). The numbers include Denmark, as we want to report the effect of dry powder in the Nordics as a whole on our sample. Descriptive statistics on fundraising in section 6.1 are based on data obtained from Argentum by Jon Fredrik Vassengen and from VE. The data from Argentum covers the period 2006-2017 (also these figures

[5]This number relates to deals with data on both revenue at entry/exit, EBITDA and EBITDA margin at entry, and total assets at entry. Viewing these financial records separately, the number is higher.

[6]Established year of the PE firm and fund, and fund size.

[7]Dry powder, VIX-index and M&A and IPO market activity.

include Denmark) and includes funds and their respective amounts raised. Hence, we are provided with both amount raised and number of buyout funds. The raised amounts are registered at the time when the funds have publicly announced their amounts, so that in cases where a fund has reported more than one closing the total amount is split over the respective years. For the years prior to 2006, we are able to obtain fundraising amounts and number of funds raised from VE.

Data on the number of yearly M&A transactions and IPOs in the Nordic private equity market is obtained from Bloomberg. The same source is used in collection of absolute values of the VIX-index over the sample period.

5.2. Variables

In the following, we present the variables used in our analyses. In line with Jenkinson and Sousa (2015), we divide the independent variables into three categories: i) portfolio company specific, ii) PE fund- and firm specific and iii) market conditions. Limited access to data requires the use of proxies, and we will provide the reasoning behind the choice of them.

5.2.1 Dependent variables

Holding period, the period between the investment date and exit date, is used as dependent variable. The variable is right-censored.

5.2.2 Independent variables

Portfolio company specific variables

In the study of hypothesis 1.1, *Revenue CAGR* is used as independent variable, based on the findings of Gompers et al. (2015) that revenue growth is the most important source of added value. A portfolio company´s compounded annual growth rate (CAGR) is measured from entry to exit. To reduce potential endogeneity issues, *Revenue* and *Total assets* are included as control variables, all measured at the year of entry.

Buy and build is a binary variable included based on the findings of Hammer (2018) that portfolio companies used in a buy-and-build strategy have a longer holding period.

The variable takes the value 1 if the portfolio company is a platform company used in a buy-and-build strategy, and 0 otherwise.

PE firm- and fund specific variables

In their study of PE firms´exit decision, Jenkinson and Sousa (2015) include the age of the PE firm (as proxy for experience) and PE fund as well as the size of the fund as explanatory variables. They find fund size and fund age to have significant effect on the speed of exit. Based on this, we include *PE fund size* and *PE fund age* as explanatory variables at PE firm- and fund level. Additionally, *PE firm age* is included to see whether experience of the PE firm has an effect on the holding period in our sample. The fund size variable refers to total amount committed to the fund, whereas fund age and firm age is measured as the difference between the year of entry and the established year of the fund and firm, respectively. Also, *Target age* is included as a control variable based on Jenkinson and Sousa (2015) findings that the age of the portfolio company is statistically significant as determinant for a PE firm´s chosen exit route. The age is defined as the number of years from the company was established until the entry year of the PE firm.

When it comes to a PE firm´s likelihood to raise a follow-on fund, Chung et al. (2012) find that performance of the current fund has a significant effect on the firm´s ability to raise a follow-on fund. We are unable to obtain the track records of the PE firms and their funds, as measures such as gross multiples and IRRs are rarely public. However, in addition to the likelihood of raising a subsequent fund, also the size of that fund is found by Chung et al. (2012) to be positively related to the performance of the current fund. Since the size of a potential follow-on fund is not known to us, we use the size of the current fund as proxy for performance of that same fund. Based on previous literature, we hypothesize that poor performing funds are of those less likely to raise a follow-on fund (e.g. due to their low ability to attract investors). To represent this group of funds, we include a binary variable *Lower-performing funds*. The variable takes the value 1 if the fund´s size (and presumed performance) is below the 25% percentile of all reported fund size values, and 0 otherwise. This allows us to study the effect of fund performance (measured by size) on holding periods.

Additionally, *First fund* is included as a binary variable which takes the value 1 if the fund is a first time fund or the sole fund raised by the PE firm, and 0 otherwise. Motivated by empirical studies that report conflicting results on the effect of young funds on holding period (Giot et al. (2014), Gompers (1996)), adding this variable enables us to investigate the effect of lower-performing funds which also is first time funds. To test this effect, our empirical analysis include an interaction between the two variables *Lower-performing funds* and *First fund*.

Market conditions and competitive environment

Credit market conditions are included among the explanatory variables due to their presumed effect on private equity holding periods. Different proxies are used for debt market conditions in prior literature. Jenkinson and Sousa (2015) find market conditions to have a significant impact on the chosen exit route when they use the FED tightening index to proxy for credit availability. Ljungqvist and Richardson (2008), on the other hand, use BAA corporate bond yield spread over the risk free rate as a proxy, where a high spread implies tight credit market conditions. In conversation with Magnus Vie Sundal, credit strategist in DnB Markets, we find the VIX index to be a reasonable proxy for credit spreads and credit market conditions[8]. We include *Delta VIX* as an independent variable, defined as the yearly change in the index, as the absolute level of index does not indicate whether the credit is eased or constricted.

In previous literature there is also a variety in proxies used for the M&A and IPO market conditions. Jenkinson and Sousa (2015) use the local stock market return before exit as a proxy for the IPO market activity and find it to be a significant determinant for IPO exit timing decisions. In line with Ljungqvist (2003) and Wang and Wang (2012), we use the number of M&A deals and IPOs as proxies for the market conditions in the Cox model, where the variables are time-varying. In the ordered model we create a dummy variable for both the M&A market and the IPO market, as a replacement for the time-varying covariates. The market conditions at exit are defined as being either "hot" or "cold",

[8]The VIX index shows implicit volatility priced into options at the US stock exchange. Hence, the index is not fully representative for the Nordic market, however in our context the proxy is found sufficient.

where the binary variable takes the value 1 if the market is "hot" and 0 otherwise[9]. We also include *Dry Powder* as an independent variable for market conditions at exit. Dry powder represents the amount of capital raised but not yet invested by the funds. We have access to the actual estimates of dry powder in the Nordics through BVCA (2017), and hence we use this data directly without the need to proxy for it. We include the variable under the assumption that an abundant amount of dry powder implies a favourable exit market due to presumably high valuation multiples (McKinsey & Company, 2018).

Finally, in the study of hypothesis 3.1, we include *Number of funds raised* as a variable to proxy for competition. More funds raised implies more capital under management, and presumably the supply of private equity funding may exceed the demand for funding.

[9]The market is defined as hot if the year in question is in the top third quartile of the most active M&A and IPO periods.

5.3. Limitations

5.3.1 Data Collection

A substantial amount of data has been collected from the Bureau van Dijk database Orbis, VE and ACPE database to enable research on the hypotheses. Our analysis include a significant number of explanatory variable, which increases the accuracy of the model. However, the high number of variables decreases the final number of observations. Neither Bureau van Dijk nor ACPE's database offered complete information on the portfolio and PE companies. Therefore the most profound limitation is the restricted availability of data.

Further, when true observations are missing in Bureau van Dijk and SNF the service reports a calculated estimation based on different database sources. We have checked some of the observations manually, however it was not possible to confirm all of the estimated information and the unconfirmed numbers was treated by the authors as if accurate. Imprecise information may therefore exist in the underlying data. Overall the underlying data set include missing data and possible imprecise estimations that impose constraints on the ability to uncover causal relationships and is likely to have affected the results generated.

5.3.2 Data Treatment

In the analysis we use yearly data, which might exclude us from capturing the variance in market conditions variables like Delta VIX. Gompers et al. (2015) finds that capital market conditions are the second most important factor when deciding on exit timing. The Delta VIX can vary significantly within a year. When using the yearly change we might be missing valuable information with regards to the effect credit markets can have on holding periods in the shorter term.

Lastly it is important to note that even though we are referring to the Nordic countries as one PE Market, the three countries have several differences. For instance differences in the states economy can influence the performance of portfolio companies. The same issue might occur for different sectors. It is likely to assume that the economical performance

of a sector effects the performance of portfolio companies in that given sector. We try to control for differences between the countries and sectors by including fixed effects. However, there might still be significant differences across the region or sectors that are not controlled for and that may have influenced the results.

6. Empirical Analysis & Results

6.1. Descriptive statistics

Table 6.1 reports summary statistics for the full sample, which consists of 343 private equity backed companies with entry dates ranging from year 2000-2016. Statistics on portfolio company level indicate that a portfolio company´s average (median) revenue CAGR has been 17.1% (6.6%) in our sample. Total assets have on average grown 12.3%, whereas the median has been lower on 6.4%. Lastly, the typical portfolio company has existed for 19 years when bought by a PE firm.

The PE firm and fund level characteristics indicate that the typical PE firm in our sample has nearly 14 years of experience when investing in the companies, whereas it takes just above 2 years from the fund is established until the investments are made. We further observe that our sample comprises funds with amounts of committed capital ranging from 3 million to 10 billion euros, and that the average fund has raised approximately 655 million euros. In comparison with studies on European private equity funds, our sample contains buyout funds of a smaller size.

Average holding period is 5 years[1], which is higher than findings by Jenkinson and Sousa (2015) on European private equity deals but in line with studies that report an average holding period of four to five years[2].

[1]This average includes both exited and current portfolio companies, where the holding period for current investments are measured as year 2017 minus the entry year. The average holding period for exited investments is 5.3 years.

[2]Achleitner (2014) report an average holding period of 4.5 years for realized and unrealized buyout transactions in US and Europe between 1990 and 2010. Further, Degorge (2015) find an average holding period of 4.4 years for buyouts between 1986 and 2007.

Table 6.1 – Summary statistics

Variable	N	Mean	St. Dev.	Min	Median	Max
Holding period (years)	343	5.0	2.8	1.0	4.0	14.0
Panel A: Portfolio company						
Age (years)	341	19.1	27.0	0.0	9.0	206.0
Revenue (€m)	285	37.8	113.1	0.0	11.3	1,188.0
EBITDA (€m)	226	1.3	13.1	−102.2	1.2	69.6
EBITDA margin (%)	217	4.3%	36.4%	−275.1%	8.6%	97.5%
Total Assets (€m)	297	41.6	92.8	0.0	13.6	869.0
Revenue CAGR	246	17.1%	41.6%	−90%	6.6%	234%
EBITDA change (€m)	114	3.4	20.0	−8.5	0.4	201.5
Total assets CAGR	163	12.3%	21.6%	−50.6%	6.4%	131.0%
Panel B: PE firm and PE fund						
PE firm age (years)	337	13.8	10.8	0.0	12.0	94.0
PE fund age (years)	272	2.1	2.1	0.0	2.0	13.0
Fund size (€m)	267	654.4	1,487.6	3.0	220.0	10,907.0
Panel C: Market conditions						
VIX-index	343	14.6	5.0	11.0	12.6	31.8
Number of MA	343	63.3	23.7	27	66.5	117
Number of IPOs	343	46.1	40.4	5	35.5	141
Number of funds raised	343	8.0	3.9	0.0	7.0	17.0

The table includes summary statistics for the full sample, i.e. both current holdings and exited investments. First line shows summary statistics for the holding period. Panel A reports portfolio company characteristics, where Age (years), Revenue, EBITDA, EBITDA margin and Total Assets are measured at the year of entry. Revenue CAGR and Total Assets CAGR are measured from entry to exit. Panel B presents PE firm- and PE fund characteristics, age for both PE firm and fund, including fund size value is measured at time of entry. Panel C reports market conditions. Delta Vix,number of M&As and IPOs and number of funds are measured at time of exit, while dry powder is measured at time of exit.

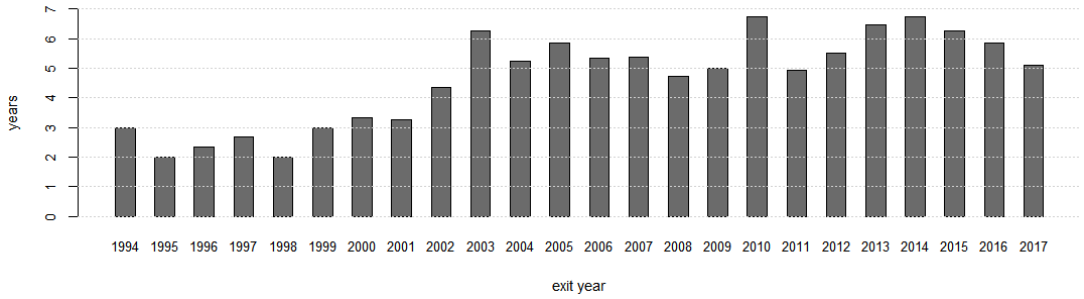
Figure 6.1 shows that average holding period historically has lengthened. For our sample, private equity holding periods have increased from an average of 2.6 years in the 1990s to 5.1 years for companies exited in year 2017.[3] The results of a Wilcoxon Rank-Sum test[4] reveals that holding periods of Nordic PE investments have significantly changed from 4.9 years before the financial crisis to 5.9 years after the crisis. This coincides with later research on buyout duration, suggesting that holding periods have prolonged after the financial crisis (see e.g. Jenkinson and Sousa (2015), Bain & Company (2018)). Although the trend has been upward sloping, Figure 6.1 indicates that holding periods have slightly

[3]In estimation of development of holding periods we utilize available data on entry- and exit dates also from before year 2000

[4]Wilcoxon rank-sum test is preferred to Wilcoxon signed-rank test, as the data is not paired and it allows for different amount of observations in the two samples.

shortened after year 2014. The peak in 2014 is in line with data on European private equity-backed buyouts, where 2014 is referred to as a breaking point (Grille, 2016). Hence, the development in holding periods in our sample of Nordic countries seems to follow the same pattern as for European private equity deals.

Figure 6.1 – Average holding period of exited portfolio companies by exit year



The subsequent graphs describe how our sample looks like in terms of number of entries and exits over time, as well as how long the investments historically have been held. First, Figure 6.2 presents number of entries by entry year. We observe an increase in private equity activity prior to the financial crisis, with 26 entries in 2008 which in 2009 dropped to 17 entries. This is in line with the development observed in PE activity globally, with the financial crisis being clearly visible due to a higher skepticism among investors. The distribution of yearly entries is shown in Figure 6.3, grouped into which time frame they have been exited. Current holdings are also reported, and we note that about 30% of the investments made just prior to the crisis had not been exited by the end of 2017.

Figure 6.2 – Number of entries by entry year

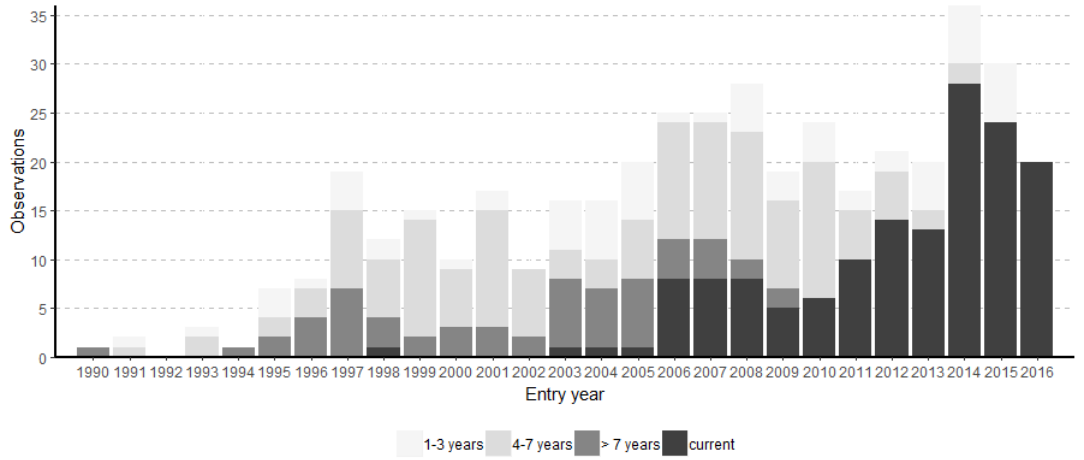
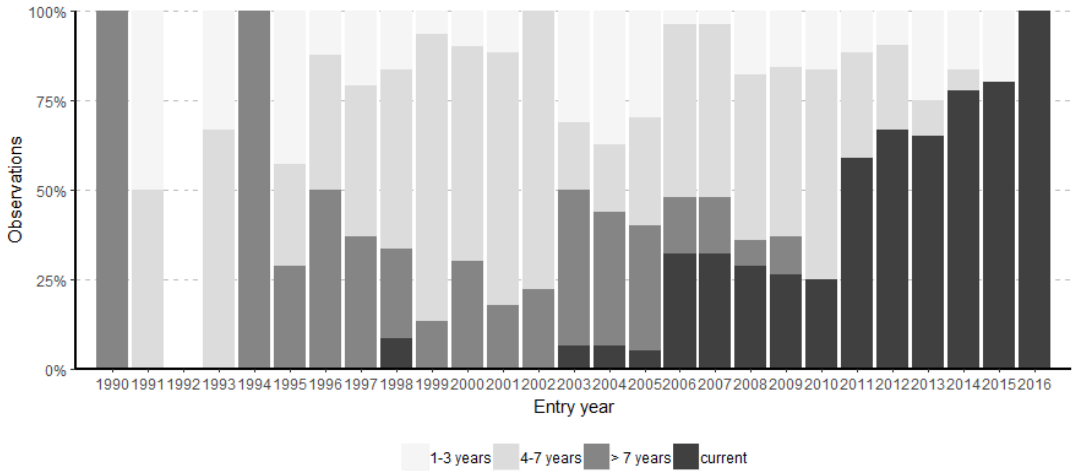


Figure 6.3 – Distribution of yearly entries by holding period groups



Further, Figure 6.4 presents number of exits by exit year. Our sample clearly contains exits mostly in the period 2005-2017, with the exception of just prior to, during and in the wake of the financial crisis. Hence, in spite of a small number of observations overall, the effect of the financial crisis on the private equity industry is made visible in our sample. The distribution of yearly exits grouped into average holding periods is presented in Figure 6.5. It indicates that the share of number of deals exited in the time span of 1-3 years have decreased over the sample period, whereas deals with a holding period of 4-7 years contributes to a greater share of number of exits.

Figure 6.4 – Number of exits by exit year

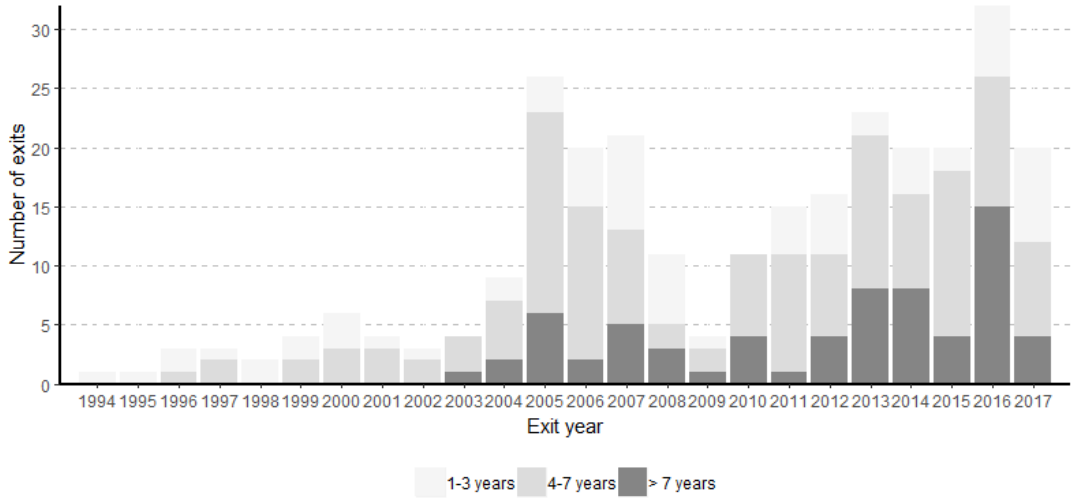


Figure 6.5 – Percentage of yearly exits by exit year

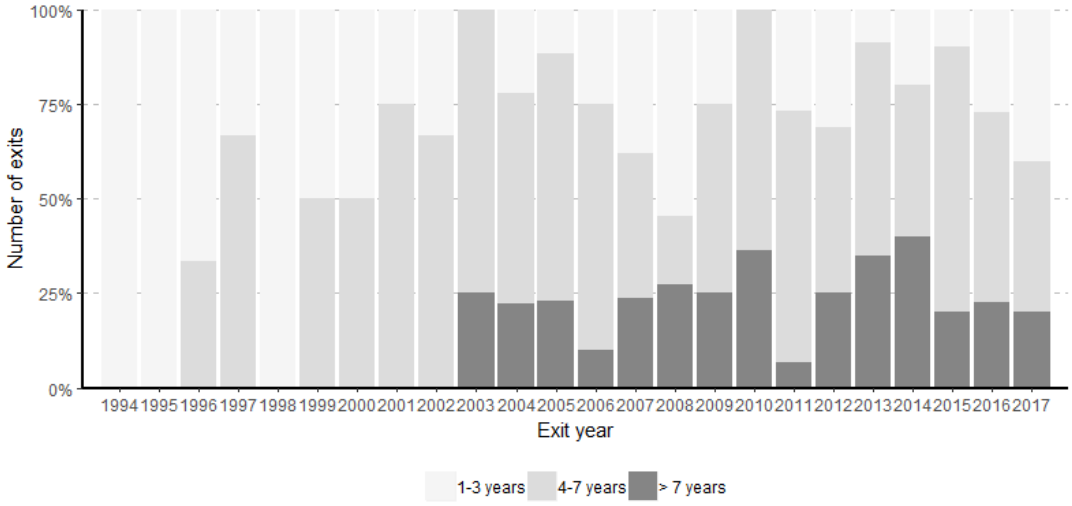
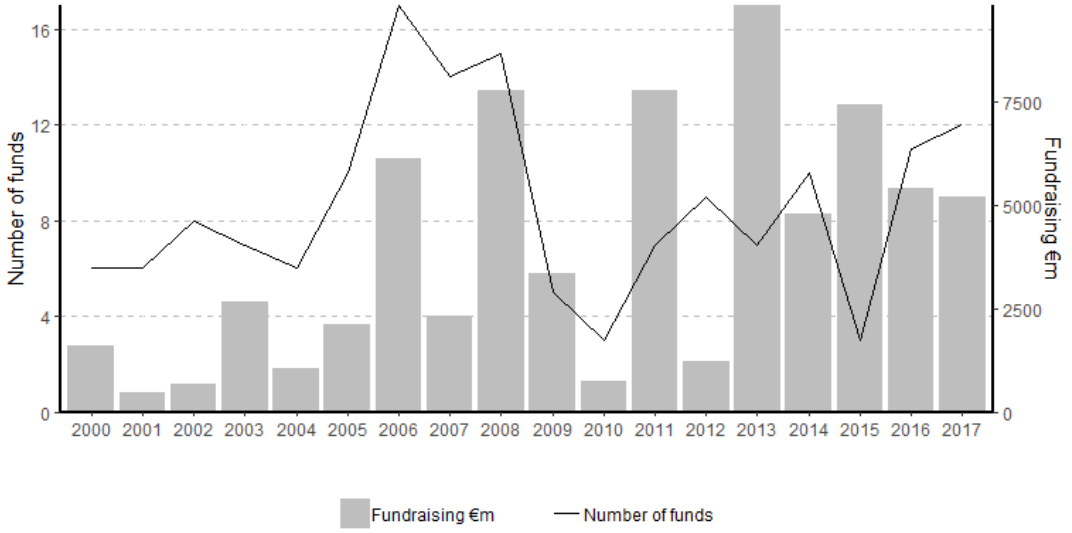


Figure 6.6 presents statistics on capital raised into the private equity market, as well as number of buyout funds raised over the sample period[5]. The amount of capital raised increased in the years prior to the financial crisis, in which coincides with the increased number in investments made by private equity funds in the sample over the same time horizon, as reported in Figure 6.2.

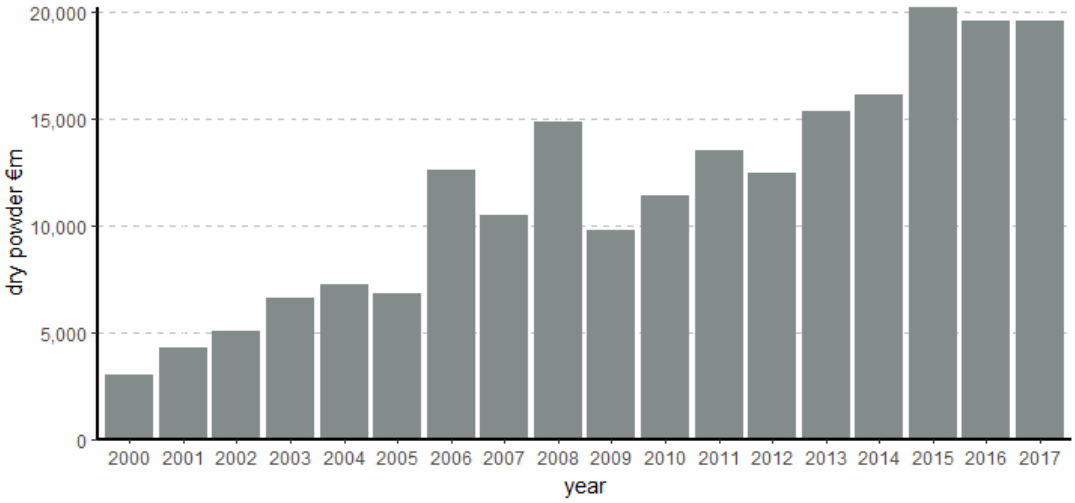
Figure 6.6 – Fundraising value and number of buyout funds raised



[5]These figures represent the Nordic market in total (including Denmark) and are not limited to the capital raised by the PE funds collected in our sample.

Figure 6.7 shows historical dry powder in the Nordic region, including Denmark. The figure indicates that the amount of uncalled capital has increased in particular after the financial crisis. Accumulated dry powder has been a source to a rise in valuation multiples (McKinsey & Company, 2018).

Figure 6.7 – Historical dry powder (€m)



6.2. Probability of occurrence of an exit

The empirical results from Cox´s proportional hazard model are reported in Table 6.2. Market level control variables are included in all columns due to their proven importance in the exit decision. To reduce problems with endogeneity, industry fixed effects and country fixed effects are controlled for in all columns. We also test for correlation between the included independent variables to detect possible multicollinearity issues. The test reports correlation for some variables, however, the correlation is low and we conclude that our model is not subject to collinearity issues.[6].

Due to missing data, the number of observations vary depending on which set of explanatory variables are studied. Following this, the number of observations drop in our regressions when all explanatory variables are included. To reveal this fact, the first column includes portfolio company specific variables alone (besided market control variables), whereas the second column includes PE firm- and fund specific variables. The third column reports all explanatory variables and presents the results of this regression.

[6]See Table 8.4 in Appendix for correlation matrix.

Table 6.2 – Cox´s Proportional Hazard Model

Dependent variable: *Hazard rate of an exit*			
	Portfolio company	PE firm/fund	Portfolio company + PE firm/fund
ln revenue	0.099		0.102
	(0.064)		(0.077)
ln total assets	0.044		0.037
	(0.071)		(0.098)
revenue CAGR	**0.915*****		**0.898*****
	(0.248)		(0.329)
buy&build	-0.086		0.093
	(0.246)		(0.319)
ln target age		-0.060	-0.155
		(0.064)	(0.096)
ln PE fund size		-0.012	-0.148
		(0.098)	(0.151)
lower-performing funds		0.053	-0.030
		(0.075)	(0.138)
first fund*lower-performing funds		-0.151	-0.263
		(0.378)	(0.647)
ln PE fund age		**0.337****	0.068
		(0.163)	(0.201)
ln PE firm age		0.067	0.284
		(0.111)	(0.198)
ln number of funds	**-0.492****	-0.190	**-0.737*****
	(0.239)	(0.250)	(0.285)
delta VIX	0.013	-0.030	0.014
	(0.026)	(0.029)	(0.033)
ln number of M&As	-0.020	0.621	0.411
	(0.574)	(0.720)	(0.835)
ln number of IPOs	**0.735*****	0.053	**0.635*****
	(0.197)	(0.188)	(0.245)
ln dry powder	**1.319****	**0.979***	**1.707****
	(0.572)	(0.538)	(0.755)
Sector fixed effects	Yes	yes	Yes
Country fixed effects	Yes	Yes	Yes
Wald chi2	95.96	56.24	94.35
prob > chi2	0.000	0.000	0.000
No of failures	143	140	104
Observations	738	1278	533

This table presents the results of Cox´s proportional hazard model with robust standard errors in parentheses. The model includes deals that are both exited and not exited (right censored data) at the end of the sample period. The dependent variable is the hazard rate of an exit, in which is regressed on a variety of explanatory variables explained in detail in Section 6.3. *Revenue, Total assets, Target age, PE fund size, PE fund age*, *PE firm age* and *Number of funds* raised are defined and measured at time of entry. *Revenue CAGR* is measured from entry to exit. Time-varying variables *Delta VIX, Number of M&As* and *IPOs, Dry powder* and are measured yearly. Statistical significance for 1%, 5% and 10% level are denoted ***, **, *, respectively. The first specification includes only portfolio company specific variables (besides market control variables), the second specification includes only variables at PE firm- and fund level, and, finally, the third specification includes all variables. Results are interpreted from the third specification with all variables included to minimize endogeneity problems caused by omitted variables.

On portfolio company level, the coefficient of *Revenue CAGR* is positive and significant at 1% level. This suggests that portfolio companies with stronger revenue growth are held shorter. Hence, we find support for hypothesis H1 that firms with slower revenue growth are held longer. The variable *Number of funds raised* is negative and significant at the 1% level, indicating that competition at entry (measured by number of funds) is positively correlated with the length of holding periods. This result supports hypothesis H3.1 and corroborates the reasoning by Thaler (1988); increased competition among PE firms leads to entries into companies with high valuation multiples (as more funds source fewer deals), implying that the portfolio company is overvalued at entry. Following this, PE firms may invest in companies of lower quality relative to the price paid, that is, companies in which value creation presumably takes longer. In cases where PE firms buy these companies and successfully improve their operational performance, the PE firms can still see themselves necessary to keep the companies longer in their portfolios simply because the high entry multiples make it hard to achieve a wanted return.

From Figure 6.6, we learn that the number of funds raised was high in the Nordic market in particular in the years prior to the financial crisis. Furthermore, Figure 6.2 and 6.3 indicate that a notably share of PE investments made during these years were not exited by the end of 2017. Accordingly, it can be assumed that the significant coefficient of *Number of funds raised* stems from investments made in the period just prior to the crisis. By excluding the years 2006-2008 from the regressions, the results remains the same and are thus unreported.

The variable *Number of IPOs* is positive and significant at the 1% level, which is in line with what we expected. The result suggests that an increase in the IPO activity increases the hazard rate of exit, indicating a shorter holding period. PE firms presumably take advantage of "open windows" in the IPO market by taking their companies public in times with optimistic investors and higher valuations.

The variable *dry powder* is positive and significant at the 5% level, indicating that abundant amount of uncalled capital in the market plays a role in driving holding periods through faster exits. Our findings support current research, namely that PE firms aim to sell their investments when dry powder is high and the environment is characterized

by high valuation multiples (McKinsey & Company, 2018). Lastly, our findings do not support hypothesis H2 that funds considered as less likely to raise a follow-on fund hold their investments longer. This is tested with the variable *lower-performing funds* alone and in interaction with the binary variable *first fund*. We expected to find that these funds hold companies longer, either because they want to keep fees on invested capital, or simply because they lack expertise to perform quick exits. The coefficients are negative and intuitively in line with our hypothesis but insignificant. Furthermore, we find no statistical evidence for hypothesis H3.2 that credit market conditions play a role in driving holding periods. Of course, not finding a significant effect from *delta VIX* may also be due to the fact that the proxy variable may not be adequate. Ideally, we would want to obtain credit spreads for the Nordic region in particular.

To further interpret the likelihood of the holding period within different time frames, we deploy an ordered probit model with sample selection as a robustness check for Cox´s model, where the holding period is a categorical outcome.

6.3. Probability of an exit within different time frames

6.3.1 Sample selection bias

We analyze the probability of an exit within different time frames by deploying an ordered probit model with sample selection. While Cox´s proportional hazard model provides unbiased estimates, the use of a simple ordered probit model gives rise to "sample selection bias". The bias originates as a result of a number of variables being observed only for investments that are exited. Since exits do not occur randomly, observed values on these observations only will lead to bias in the results. The ordered probit model with sample selection mitigates the selection bias. However, we cannot rule out that selection bias still exists. In the following, we present assumptions made in order to run the sample selection model.

In predicting the likelihood of exit (the first stage of Heckman), we include *Hot M&A market*, *Hot IPO market* and *dry powder* as independent variables. These variables are assumed to determine whether an investment is exited, and through this have an impact on the holding period. Initially, we are prevented from predicting this as the exit decision

variables are only observed for exited investments.[7] This problem does not occur in the Cox model due to the variables being time-varying, that is, exit market decision variables are observed each year for all investments until the end of the sample period (or until an exit occurs). In order to successfully run the model, we let current holdings be assigned the value of the market variable in question which we observe five years into the holding period, e.g. in case of IPO activity: for a current investment with entry year 2010, we assign the value 1 if the IPO activity was hot in 2015, and 0 otherwise. This is based on the fact that the average holding period of an investment is five years, and we assume that, under the circumstances of favourable market conditions, the investments would be exited at this point in time.

The results from Heckman report significant evidence that exit market conditions impact the likelihood of an exit, and hence the ordered probit model with sample selection is preferred to a simple ordered probit model. Table 8.5 in Appendix presents the difference in coefficients between the two models and underlines the importance of mitigating the selection bias. Nonetheless, We cannot rule out that selection bias still exists.

6.3.2 Ordered probit model with sample selection

The ordered probit model is preferred to a multinomial probit model as it accounts for the ordinal nature of the dependent variable (Greene, 2003), which is holding period. The dependent variable is the categorical variable Holding period that takes value 1 in case of Short Holding period (1-3 years), 2 when Medium Holding period occurs (4-6 years), and 3 in case of Long Holding period (7+ years). The advantage of holding period as a categorical variable is that we are able to assign a category also for those investments not yet exited: we restrict the sample period to include deals with entry date between 2000-2010. Investments made in this period which are labeled as current holdings (and hence not exited by year 2017) are assigned a fictitious holding period of 2017 minus actual entry year. Consequently, current holdings have a holding period of at least seven years, and the ordered model will categorize them as investments with Long Holding period.

Table 6.3 confirms that market level conditions play a significant role in driving PE

[7]STATA deliberately omits independent variables that predicts failure or success perfectly.

Table 6.3 – Ordered probit with sample selection

Dependent variable: *Holding period (categorical)*				
		ME	ME	ME
		(SE)	(SE)	(SE)
	Full sample	Short holding period	Medium holding period	Long holding period
ln revenue	0.02	-0.00	-0.00	0.01
	(0.10)	(0.02)	(0.01)	(0.03)
ln total assets	-0.11	0.02	0.01	-0.03
	(0.11)	(0.02)	(0.02)	(0.03)
revenue CAGR	-0.31	0.05	0.04	-0.09
	(0.43)	(0.07)	(0.06)	(0.12)
buy&build	-0.20	0.03	0.03	-0.06
	(0.43)	(0.07)	(0.06)	(0.13)
ln target age	**0.33***	**-0.05***	**-0.05***	**0.10****
	(0.18)	(0.03)	(0.02)	(0.05)
ln PE fund size	-0.20	0.03	0.03	-0.06
	(0.20)	(0.03)	(0.03)	(0.06)
lower-performing funds	-0.20	0.03	0.03	-0.06
	(0.14)	(0.02)	(0.02)	(0.04)
first fund*lower-performing funds	0.46	-0.08	-0.06	0.14
	(0.76)	(0.12)	(0.10)	(0.22)
ln PE fund age	0.47	-0.07	-0.06	0.14
	(0.36)	(0.06)	(0.05)	(0.10)
ln PE firm age	0.16	-0.03	-0.02	0.05
	(0.28)	(0.04)	(0.04)	(0.08)
ln number of funds raised	**1.29****	**-0.20****	**-0.18****	**0.38*****
	(0.60)	(0.08)	(0.07)	(0.14)
delta VIX	-1.00	0.16	0.125	-0.25
	(0.64)	(0.10)	(0.09)	(0.18)
HOT M&A market	**-1.02***	**0.16****	**0.14****	**-0.30****
	(0.53)	(0.08)	(0.08)	(0.14)
Hot IPO market	**1.11***	**-0.18***	**-0.15****	**0.33****
	(0.62)	(0.10)	(0.08)	(0.17)
dry powder	-0.80	0.12	0.11	0.23
	(0.59)	(0.09)	(0.08)	(0.16)
Sector fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Wald chi2	30.31			
LR test of indep, *Prob>chi2*	0.0089			
Selected	173			
Nonselected	45			
Observations	218			

This table presents the results of an ordered probit regression model with sample selection, for investments with entry year between 2000 and 2010. The dependent variable is the categorical variable Holding period that takes value 1 in case of Short Holding period (1-3 years), 2 when Medium Holding period occurs (4-5 years), and 3 in case of Long Holding period (6+ years). Holding period is regressed on a variety of explanatory variables explained in detail in Section . *Revenue, Total assets, Target age, PE fund size, PE fund age, PE firm age* and *Number of funds raised* are defined and measured at time of entry. *Revenue CAGR* is measured from entry to exit. *Delta VIX, HOT M&A market* and *Hot IPO market*, as well as *Dry powder* are measured at exit. Robust standard errors are reported in parentheses. Statistical significance for 1%, 5% and 10% level are denoted ***, **, *, respectively. The first column presents the regression coefficients, while the other columns present the corresponding average marginal effects (ME) for each HP category.

holding periods. First, the variable *number of funds raised* continues to be significant. The marginal effects indicate that a short and medium holding period is less probable when competition at entry is high, whereas the probability of a holding period longer than seven years increases. This is in line with our findings from Cox´ model and supports the hypothesis that investments made in times with more competition are held longer.

Further, in the study of the effect from M&A- and IPO market, the results are mixed. First, the marginal effects of the binary variable *Hot M&A market* are significant at 5% level. The results indicate that a short holding period is on average 16% more probable in the case of a hot market. A medium holding period is 14% more probable for this case, whereas a long holding period is 30% less probable. Hence, we find support for hypothesis H3.3 in the case of M&A market activity, namely that investments are held longer in times with lower activity in the M&A market. Second, the marginal effects of the variable *Hot IPO market* indicate that a short holding period on average is 18% less probable when IPO activity is high. A long holding period is 33% more probable in this case. A possible explanation of the unexpected result could be that exiting through an IPO presumably is more time-consuming compared to trade sales (it involves parties as lawyers, investment bankers and accountants). Nevertheless, the result contradicts our findings in the Cox model, presumably due to the variable not being time-varying, which highlights the importance of time-variance of the market level variables. Also the variable *dry powder* loses its significant in the ordered probit model.

As in Cox´s model, we find no evidence that credit market conditions play a role in determining holding periods. Lastly, the coefficient of *target age* is significant at 10% level. The marginal effects suggest that a short holding period on average is 5% less probable for a one-unit increase in target age, whilst a long holding period is 10% more likely for this case. These findings contradicts Jenkinson and Sousa (2015), who find evidence of shorter holding periods for older companies.

To conclude, the overall results suggest that market plays a key role in driving Nordic private equity holding periods. The results from the ordered probit model contradicts our findings in Cox´s proportional hazard, presumably due to exit decision variables not being time-varying in the former (and a smaller sample size reduces number of observations).

Hypothesis H2 that investments made in times with more competition are held longer is supported in both models, and is measured at entry by the variable *number of funds raised*. The ordered model does not support the hypothesis that stronger revenue growth shortens holding periods.

Table 6.4 below summarizes whether our findings provide support for the hypothesized effects, emphasizing the results from Cox´ proportional hazard model.

Table 6.4 – Results

Hypothesis	*Results*
H1: Portfolio companies with slower revenue growth are held longer	Supported
H2: Funds that are less likely to raise a follow-on fund hold their investments longer	Neither supported nor rejected.
H3.1: Investments made in times with more competition are held longer	Supported
H3.2: In times with tightening of credit, investments are held longer	Neither supported nor rejected.
H3.3: In times with lower activity in the M&A and IPO market, investments are held longer	M&As: neither supported nor rejected, IPOs: supported.

6.4. Discussion of Regression Design

6.4.1 Endogeneity

Ideally, we would want to establish that the relation between length of holding period and independent variables is causal, rather than just a correlation. To reduce endogeneity issues caused by observable factors, control variables at portfolio company level, PE firm- and fund level, and market level are included[8].

In order to establish causality, we also need to rule out that unobservable factors cause the observed correlation between the significant explanatory variables and holding period. An unobservable factor could be "preferances of PE firms", namely that some PE funds prefer longer/shorter holding periods. Also, a potential concern is that the holding period could be predicted already before the PE firm invests in the portfolio company, so that unobserved pre-deal characteristics influence the decision of when to exit. This issue could be addressed with an instrumental variable regression, in which would require a factor that impact these variables but does not have an impact on the length of the holding period. We cannot rule out the scenario that endogeneity issues drive the results, and hence, our findings should be interpreted with care.

[8]E.g. Revenue, Total assets, PE firm- and fund age.

7. Conclusion

This thesis examines potential determinants of private equity holding periods. While current research mainly cover the global and European PE market, our thesis contributes to a deeper understanding of the characteristics of the Nordic region. A final sample of 343 private equity transactions in Finland, Norway and Sweden between 2000 and 2016 reveals insight into the effect on holding periods through the following sets of factors: i) portfolio company characteristics, ii) PE firm and fund characteristics and, lastly, iii) market level conditions.

The results suggest that market level variables play a significant role in driving private equity holding periods. Evidence is found that investments made in times with high competition are held longer, presumably as a result of PE firms sourcing more bad deals to high valuation multiples. Furthermore, an abundant amount of dry powder in the market tends to accelerate the pace of exit. The study of the effect of M&A- and IPO activity reveals mixed results. While high IPO activity significantly shortens holding periods, such evidence is not found in the case of a hot M&A market. Additionally, we cannot find support for the hypothesis that tightening in credit is associated with longer holding periods.

Results on portfolio company level suggest that portfolio companies with slower revenue growth are held longer, which is in line with expectations. Evidence is not found that funds that are less likely to raise a follow-on fund hold their investments longer.

This thesis, and the results it provides, is based on a constructed data set and an array of factors to capture Nordic private equity activity. The private nature of the private equity industry and lack of high-quality data, however, is a major limitation of the study. Consequently, we are prevented from revealing all causal relationships that potentially affect private equity holding periods.

Even though our thesis provides insightful analysis of determinants of holding periods, our study is limited to analyzing only parts of the Nordic region. In order to strengthen the findings in this paper, an aim could be to expand the data set by including all private equity transactions in the Nordics. Further, Bain & Company (2018) reports that a

lengthening of holding periods could be a result of a change in PE firm strategy. By collecting complete history data of PE firms, one could potentially uncover how their strategies have evolved over time and see this in connection with the lengthening of holding periods.

Bibliography

Achleitner, A.-K. Figge, C. (2014). Private equity lemons? Evidence on value creation in secondary buyouts. *European Financial Management*, 2(20):406–433.

Arcot, S., Fluck, Z., Gaspar, J. M., and Hege, U. (2015). Fund managers under pressure: Rationale and determinants of secondary buyouts. *Journal of Financial Economics*, 115(1):102–135.

Axelson, U. e. a. (2013). Borrow cheap, buy high? The determinants of leverage and pricing in buyouts. *The Journal of Finance*, (6).

Bain & Company (2018). Global Private Equity Report 2018.

BerchWood Partners (2013). The Nordic Private Equity way: A Model That Works.

BVCA (2016). Guide to Private Equity and Venture Capital in the Nordics.

BVCA (2017). BVCA Nordic Forum.

Chung, J. W., Sensoy, B. A., Stern, L., and Weisbach, M. S. (2012). Pay for performance from future fund flows: The case of private equity. *Review of Financial Studies*.

Cox, D. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society*, pages 187–220.

Degorge, F., M. J. . P. L. (2015). On secondary buyouts. *Journal of Financial Economics (forthcoming)*, 384:13–48.

EY (2015). A two-speed industry: How do private equity investors create value?

Gilligan, J. and Wright, M. (2014). Private equity demystified: An explanatory guide. Technical report.

Giot, P., Hege, U., and Schwienbacher, A. (2014). Are novice private equity funds risk-takers? Evidence from a comparison with established funds. *Journal of Corporate Finance*, (27):55–71.

Gompers, P., Kaplan, S. N., and Mukharlyamov, V. (2015). What Do Private Equity Firms Say They Do? *Journal of Financial Economics (forthcoming)*.

Gompers, P. A. (1996). Grandstanding in the venture capital industry. *Journal of Financial Economics*, 42(1):133–156.

Greene, W. H. (2003). *Econometric Analysis*. Pearson Eductation International, 5. edition.

Grille, G. (2016). Holding periods lengthening again following 2015 drop. Retrieved September 2018".

Hammer, B. Hinrichs, H. S. D. (2018). Buy-and-Build Strategies and Buyout Duration: Evidence from Survival-Time Treatment Effects.

Ivashina, V. and Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial Economics*, 97(3):319–338.

Jenkinson, T. and Sousa, M. (2015). What determines the exit decision for leveraged buyouts? *Journal of Banking and Finance*, 59:399–408.

Kaplan, S.N. Strömberg, P. (2009). Leveraged Buyouts and Private Equity. *Journal of Economoic Perspectives*, 22(4):121–46.

Ljungqvist, A. and Richardson, M. (2008). The Investment Behavior of Private Equity Fund Managers. *Theory and evidence*.

Ljungqvist, A. Richardson, M. (2003). The Investment Behavior of Private Equity Fund Managers.

McKinsey & Company (2018). McKinsey Global Private Markets Review 2018.

Ritter, J. Welch, I. (2002). A review of IPO activity, pricing and allocations. *The Journal of Finance*, LVII(4).

Robert Spliid (2013). Is Nordic Private Equity Different? *The Journal of Private Equity*, 16:38–57.

Robinson, D. T. and Sensoy, B. A. (2013). Do private equity fund managers earn their fees? Compensation, ownership, and cash flow performance. *Review of Financial Studies*, 26(11):2760–2797.

Schmidt, D. and Steffen, Sascha, S. F. (2010). Exit strategies of buyout investments: An empirical analysis. *The Journal of Alternative INvestments*, 12(4):58–84.

Thaler, R. H. (1988). Anomalies The Winner's Curse. *The Journal of Economic Perspectives*, 2:191–200.

Thomas, L. and Reyes, E. M. (2014). Survival Estimation for Cox Regression Models with Time-Varying Coefficients Using SAS and R. Technical report.

Tuma, N. B. and Hannan, M. T. (1979). Approaches to the Censoring Problem in Analysis of Event Histories.

Valkama, P., Maula, M., Nikoskelainen, E., and Wright, M. (2013). Drivers of holding period firm-level returns in private equity-backed buyouts. *Journal of Banking and Finance*.

Wang, L. and Wang, S. (2012). Economic freedom and cross-border venture capital performance. *Journal of Empirical Finance*, 19(1):26–50.

Wrigth, M., Thompson, S., and Robbie, K. (1992). Venture capital and mangement led, leveraged buyouts: A European perspective. *Journal of Business Venturing*, (7):47–71.

8. Appendix

Table 8.1 – Exit route

	Exits	% of total	Avg. holding period	% exits between 1 to 3 years	% exits between 4 to 7 years	% exits over 7 years
IPO	3	1.5%	4.33	33.3%	66.7%	0.0%
Secondary Sale	60	30.6%	4.87	36.7%	48.3%	15.0%
Trade Sale	117	59.7%	5.33	25.6%	54.7%	19.7%
Unknown Exit Type	11	5.6%	6.73	18.2%	36.4%	45.5%
Write-Off	5	2.6%	6.00	0.0%	100.0%	0.0%
Total	196	100%	5.27	28.0%	53.1%	18.9%

Table 8.2 – Portfolio company nation

	Exits	Current holdings	total	% of total	Avg.holding period	% exits between 1 to 3 years	% exits between 4 to 7 years	% exits over 7 years
Finland	97	51	148	43.1%	5.26 (5.37)	26.8%	53.6%	19.6%
Norway	69	61	130	37.9%	5.18 (5.04)	33.3%	50.7%	15.9%
Sweden	30	35	65	19.0%	3.89 (5.47)	20.0%	56.7%	23.3%
Total	196	147	343	100.0%	4.97 (5.27)	28.0%	53.1%	18.9%

Table 8.3 – Sector classification of portfolio companies

	Exits	Current holdings	Total	% of total	Avg. holding period	% exits between 1 to 3 years	% exits between 4 to 7 years	% exits over 7 years
Cleantech	3	0	3	0.8%	7.00 (7.00)	0.0%	66.7%	33.3%
Consumer	46	26	72	21.0%	5.13 (5.78)	17.4%	58.7%	23.9%
Energy	17	32	49	14.3%	4.65 (4.41)	47.1%	41.2%	11.8%
Health Care & Life Science	31	12	43	12.5%	4.40 (4.84)	25.8%	67.7%	6.5%
ICT	28	17	45	13.1%	5.22 (5.36)	21.4%	60.7%	17.9%
Industrials	53	49	102	29.7%	4.81 (4.72)	41.5%	41.5%	17.0%
Other	18	11	29	8.5%	5.97 (6.72)	16.7%	44.4%	39.0%
Total	196	147	343	100.0%	4.97 (5.27)	28.0%	53.1%	18.9%

Figure 8.1 – Proportional hazard assumption for included explanatory variables

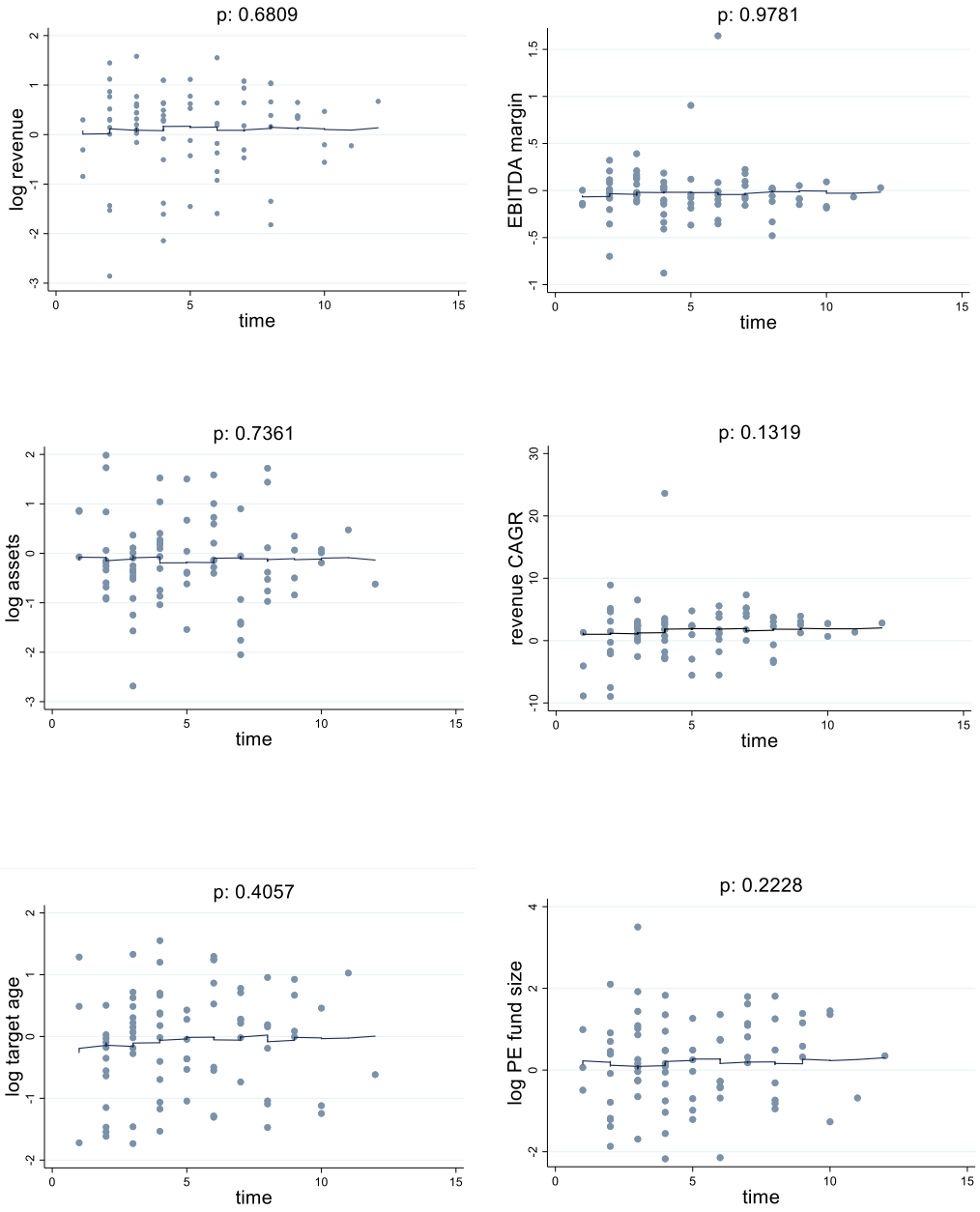


Figure 8.2 – Proportional hazard assumption for included explanatory variables

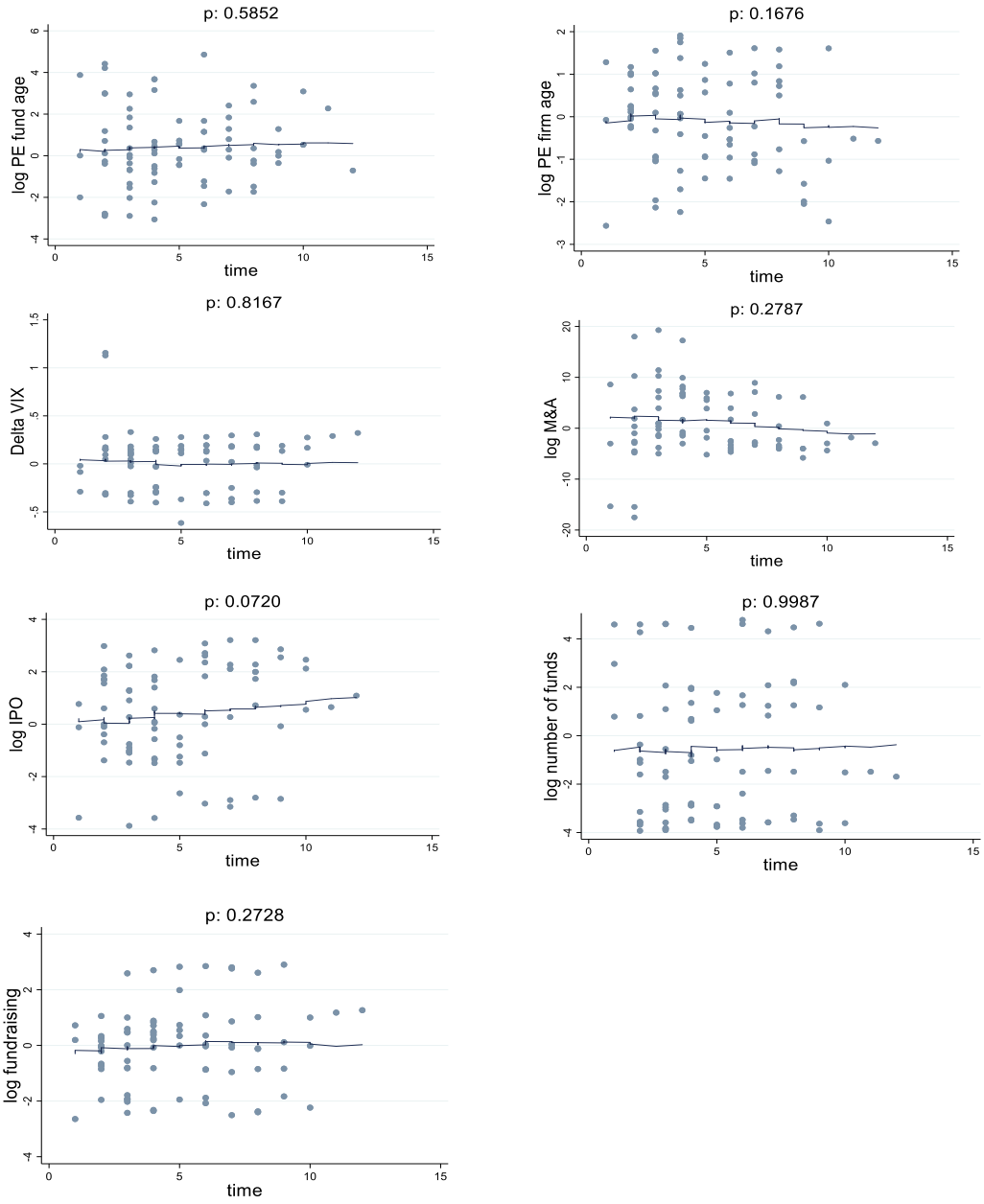


Table 8.4 – Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ln revenue	1.0000														
(2) ln total assets	0.1816	1.0000													
(3) revenue CAGR	-0.1734	-0.1332	1.0000												
(4) buy and Build	-0.1535	-01295	0.1330	1.0000											
(5) ln target Age	0.1858	0.2544	-0.0713	-0.0337	1.0000										
(6) ln PE fund size	0.2741	0.1220	-0.1923	-0.1044	0.2039	1.0000									
(7) lower-performing funds	-0.1474	-0.1750	0.1383	0.0472	-0.1774	-0.1585	1.0000								
(8) first fund*lower-performing funds	-0.0250	-0.0947	0.0369	0.1094	-0.1382	-0.3534	0.1999	1.0000							
(9) PE Fund age	-0.0127	-0.1119	-0.1164	-0.0729	-0.0107	-0.1188	0.0275	-0.0727	1.0000						
(10) PE Firm age	-0.1291	-0.0331	0.1136	0.1077	-0.0691	0.1068	-0.1466	-0.1157	0.1156	1.0000					
(11) delta VIX	-0.0023	-0.0852	-0.0689	-0.1195	-0.0570	-0.1024	0.1177	-0.0211	0.1094	0.0769	1.0000				
(12) ln number of M&As	-0.0200	-0.0536	-0.0297	-0.1038	-0.0933	-0.1282	0.1414	-0.0014	-0.0839	-0.0923	0.1462	1.0000			
(13) ln number of IPOs	0.0096	-0.0124	-0.1122	-0.1014	0.1362	0.1135	-0.0980	-0.0968	0.0936	0.0868	0.0325	0.1099	1.0000		
(14) ln dry powder	-0.0313	-0.0935	0.1218	-0.1678	-0.1354	-0.2	0.0654	0.1130	-0.0987	-0.1170	0.0527	0.0330	-0.3080	1.0000	
(15) ln number of funds raised	-0.0099	0.0656	0.0180	0.0315	0.1342	0.2978	-0.3109	-0.2318	0.3529	0.3009	-0.1830	-0.4616	0.2239	0.2373	1.0000

This table reports a correlation matrix among the independent variables (both explanatory variables and control variables).

Table 8.5 – Comparison of estimation

Dependent variable: *Holding period (categorical)*		
	With sample selection	Without sample selection
ln revenue	0.02	-0.02
	(0.10)	(0.11)
ln total assets	-0.11	-0.09
	(0.11)	(0.11)
revenue CAGR	-0.31	-0.61
	(0.43)	(0.50)
buy&build	-0.20	-0.66
	(0.43)	(0.44)
ln target age	**0.33***	**0.34****
	(0.18)	(0.16)
ln PE fund size	-0.20	-0.26
	(0.20)	(0.20)
lower-performing funds	-0.20	**-0.25***
	(0.14)	(0.14)
first fund*lower-performing funds	0.46	0.60
	(0.76)	(0.68)
ln PE fund age	0.47	0.22
	(0.36)	(0.36)
ln PE firm age	0.16	0.06
	(0.28)	(0.24)
ln number of funds raised	**1.29****	**0.83***
	(0.60)	(0.42)
delta VIX	-1.00	**-1.34****
	(0.64)	(0.56)
HOT M&A market	**-1.02***	**-0.91****
	(0.53)	(0.45)
Hot IPO market	**1.11***	**1.28****
	(0.62)	(0.55)
dry powder	-0.80	-0.58
	(0.59)	(0.52)
Sector fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Wald chi2	30.31	29.48
LR test of indep, *Prob>chi2*	0.0089	
Selected	173	
Nonselected	45	
Observations	218	

This table presents the comparison of the heckman ordered probit model and the ordered probit model without selection. The data set is restricted to include investments with entry year between 2000 and 2010. The dependent variable is the categorical variable Holding period that takes value 1 in case of Short Holding period (1-3 years), 2 when Medium Holding period occurs (4-5 years), and 3 in case of Long Holding period (6+ years). Holding period is regressed on a variety of explanatory variables explained in detail in Section 5. *Revenue, Total assets, Target age, PE fund size, PE fund age, PE firm age* and *Number of funds raised* are defined and measured at time of entry. *Revenue CAGR* is measured from entry to exit. *Delta VIX, HOT M&A market* and *Hot IPO market*, as well as *Dry powder* are measured at exit. Robust standard errors are reported in parentheses. Statistical significance for 1%, 5% and 10% level are denoted ***, **, *, respectively.