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Determinants of Nordic Private Equity: Exploring the Key Factors Shaping Investment Activity

A quantitative study of factors influencing private equity investments in the Nordic countries, examining venture capital, buyouts, and growth & turnaround capital.

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Abstract

This study provides an extensive analysis of the Nordic private equity market and investment activity. The analysis commenced with a comparative analysis of Nordic countries with Anglo-Saxon markets and other developed European nations in terms of market conditions and investment levels. The initial findings indicated that the Nordic private equity market outperformed most European peers yet fell short of matching the development observed within Anglo-Saxon markets. This assessment led to the notion that the factors influencing investment activity in foreign markets may not translate directly to the Nordic context. Consequently, the primary research question evolved to examine the specific determinants shaping private equity investments in the Nordic region.

The study analyzed the investment activity of domestic Nordic private equity funds utilizing a longitudinal dataset for Denmark, Finland, Norway, and Sweden in the period 2007-2019. The investment activity was measured using the overall private equity investment value in addition to venture capital, buyout, and growth & turnaround capital. The study was oriented around five principal dimensions: the investment environment, economic conditions, the labor market, research & development, and tax rates. The dataset incorporated 13 explanatory variables, each embodying various facets of these dimensions. The variables were analyzed using a random effects model with and without time-fixed effects.

The analysis identified ten variables as significant determinants of private equity activity in the Nordic region. Our findings emphasized the pivotal role of labor market conditions in shaping private equity activity, with a key driver being fewer regulatory restrictions in the utilization of temporary workers. Moreover, certain elements within the investment environment, particularly stock market liquidity, initial public offerings, and the prevalence of large firms in relation to small and medium-sized enterprises, were recognized as relevant drivers. Interestingly, the corporate tax rate was positively correlated with private equity investments, which contradicts common expectations. Research & development typically exhibited a negative correlation with the dependent variables under consideration. Lastly, the economic conditions dimension had the least influence on private equity investments, with only the long-term interest rate demonstrating a significant association.

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List of abbreviations

BRICS	Brazil, Russia, India, China, and South Africa
BO	Buyout
CME	Coordinated Market Economy
EAA	European Economic Area
EFTA	European Free Trade Association
EVCA	European Private Equity and Venture Capital Association
EU	European Union
FDI	Financial Development Index
ADF	Augmented Dicky Fuller
FE	Fixed Effects
GP	General Partner
GEM	Global Entrepreneurship Monitor
GDP	Gross Domestic Product
G&T	Growth and Turnaround
IPO	Initial Public Offering
IRPI	International Property Rights Index
LBO	Leveraged Buyout
LME	Liberal Market Economy
LP	Limited Partner
MBO	Management Buyout
M&M	Modigliani & Miller
NPV	Net Present Value
PE	Private Equity
RE	Random Effects
R&D	Research and Development
SME	Small and Medium Enterprises
SOE	State Owned Enterprise
OECD	The Organization for Economic Co-operation and Development
UK	United Kingdom
US	United States
VIF	Variance Inflation Factors
VC	Venture Capital

1. INTRODUCTION

The Nordic countries are recognized for their strong economies, high living standards, and comprehensive welfare systems. A less explored intricacy of the Nordic region is its elevated private equity activity. Within the European context, the private equity markets of the Nordic countries display a considerable degree of sophistication. Accounting for GDP and population size, the private equity activity is close akin to well-established markets, such as the UK. Furthermore, the Nordic countries surpass the majority of other developed European economies when using the same adjustments. Despite the considerable participation in the Nordic private equity market, there has been a scarcity of research investigating the factors contributing to this significant level of involvement. Therefore, this study aimed to determine the factors shaping the Nordic private equity investment activity, leading to the following research question: *What are the key determinants of private equity investments in the Nordics?*

A review of relevant literature guided the study's focus toward five dimensions: investment environment, economic conditions, labor market, research & development, and taxation. The study selected variables representing different aspects of these five dimensions and analyzed their influence on total private equity, venture capital, buyout, and growth & turnaround investments in the Nordic countries. The research encompassed 13 distinct explanatory variables, analyzed with and without time-fixed effects from 2007 to 2019.

The practical implications of these findings are twofold. First, the findings provide investors with a comprehension of the analyzed dimensions influencing private equity activity in the Nordic region. Investors can then utilize the findings to make informed decisions regarding the potential impacts of changes in these factors and how they will influence private equity investments. Second, these insights can prove valuable for policymakers seeking to promote regulatory changes that enhance private equity activity in the Nordics, thereby reaping the associated economic benefits. In this study, the primary focus is on the latter group, with an entire section of the thesis dedicated to the policy implications of the findings.

Concerning academic relevance, relatively limited research has been conducted on the Nordic private equity market, particularly regarding how the broader economic, financial, social, and regulatory aspects influence investment activity. Despite the limited body of research, this study leverages the available literature and expands upon prior findings in the region,

especially emphasizing the work of Spliid (2013). Consequently, this paper carries meaningful academic relevance, addressing a research gap in the current literature.

The thesis is structured as follows. Sections 2-4 establish the foundational background information necessary for the study. Following the introduction, Section 2 familiarizes the reader with private equity, discussing fund structures and various types of funds, emphasizing venture capital, buyouts, growth capital, and turnaround capital. Next, section 3 examines the economic impact of private equity, focusing on venture capital, buyout, and restructuring activities. Finally, Section 4 explores the unique characteristics of the Nordic region and provides a brief overview of the individual economies of Sweden, Norway, Denmark, and Finland.

Section 5 presents a preliminary analysis of the Nordic private equity market, providing a brief history of its development and positioning the market size within a global perspective. The analysis further explores the unique characteristics of Nordic private equity and compares the market conditions to those of more advanced Anglo-Saxon private equity markets. Subsequently, the section delves into a comparison of investment activity and deal distribution, first among the individual Nordic countries and then within a European context. Upon completion of the initial analysis, the research question for the thesis is formulated.

In Sections 6-8, fundamental efforts are undertaken to address the chosen research question. First, Section 6 involves a comprehensive literature review of private equity determinants to identify the dimensions and explanatory variables used in the analysis. Next, Section 7 provides an overview of the dependent and independent variables, along with an examination of the correlation coefficients. At last, section 8 elaborates on the research methodology, the rationale behind the model selection, and the research approach.

In the concluding sections, the results, discussion, and policy implications of the study are presented. Section 9 showcases the results of the most refined models and identifies the determinants of Nordic private equity investments. Additionally, this section includes an in-depth discussion of the significant findings. The penultimate segment, Section 10, contextualizes the research findings within a policy setting based on the determinants identified in the preceding section. In the final section, the thesis is completed with a concise conclusion.

2. PRIVATE EQUITY FUNDAMENTALS

2.1 What is private equity?

Private Equity (PE) is likely the most infamous of the various asset classes. PE funds had their first boom in the 1980s when concepts such as leveraged buyouts and venture capital became household names for the parts of the population with some financial literacy. Fraidin and Foster (2019) describe PE in the 1980s as highly profitable and controversial because the funds would acquire companies using a large amount of debt, often leading to layoffs, reduced taxation, and asset-stripping. The investment practices and aftermath of PE funds in the 1980s generated substantial criticism, which persists to this day. Despite facing significant criticism, PE has emerged as a prominent asset class, playing a crucial role in both developed and emerging markets by delivering attractive returns and contributing to the overall dynamism of financial markets.

The US Securities and Exchange Commission defines PE funds as pooled investment vehicles that raise capital from investors for the purpose of generating returns through investment activities (SEC, n. d.). Unlike mutual and hedge funds, PE funds are characterized by longer investment horizons, with an average time horizon of 10 years or more. Furthermore, PE funds typically exhibit a lower level of diversification and hedging, resulting in a higher risk profile that differs from other types of investment funds.

The limited partnership structure is the most common organization of private equity funds (Metrick & Yasuda, 2010). Under this structure, the general partners (GPs) serve as the managing entity of the private equity fund and are responsible for raising capital and making investment decisions. Meanwhile, the limited partners (LPs) are typically institutional and high-net-worth individuals that provide most of the fund's capital, with the GPs often committing a minor portion of the total capital (Zhang, 2022). The repayment structure for LPs is commonly composed of both fixed and variable payments throughout the fund's life (Metrick & Yasuda, 2010). The repayment arrangements can vary depending on the fund's investment strategy, with some funds returning capital and profits periodically. In contrast, others may distribute all the proceeds at the end of the fund's lifespan.

PE funds typically raise capital from investors to finance a range of investment opportunities, including start-up firms, middle market firms, financially distressed companies, public firms seeking buyout financing, and those with specific financing needs (Fenn et al., 1997).

However, rather than being generalists that cater to all these financing needs, most PE funds tend to concentrate on a specific investment strategy. As a result, the PE market is often categorized into various brackets comprising specialized funds that focus on particular types of investments.

2.2 The different categories of private equity funds

One of the primary types of PE funds is Venture Capital (VC), which are investment funds that provide capital to finance start-up companies with significant growth potential that may generate high returns (Gompers & Lerner, 2000). However, VC investments carry a higher risk since the probability of success for startups is estimated to be only around 10 percent (Pupkevicius, 2019). There is a common misinterpretation that PE and VC are two distinct entities, but in practice, VC is a subcategory of PE (Fenn et al., 1997; Wang & Baldridge, 2022). Thus, VC is a substantial part of the larger PE asset class that aims to generate high returns by investing in newly established firms, albeit with a higher level of risk associated with the investment. While there are differences between VC and other types of PE funds, they share certain similarities in investment practices and objectives.

Within VC, funds are often specialized in financing start-ups at different stages of their development process. Early-stage venture firms are associated with more significant risks, as funding is typically used for prototype development or financing start-up operating costs to generate revenue (Fenn et al., 1997). On the other hand, late-stage venture firms are start-ups with established market demand and proven technology that reduces some of the risks associated with the investment. These funds are often used for capacity increases and investments in equipment to support rapid growth. Nonetheless, there are more detailed differentiations for the life cycle of VC investment, as Sahlman (1990) outlines seven distinct investment stages in venture firms. By specializing in different stages of the start-up development process, VC funds can specialize, improve risk management, and increase their chances of generating high returns.

The second category of PE funds is growth equity funds, which invest in established middle-market companies with high growth potential. As opposed to venture capital, growth equity typically targets well-established middle-market firms that generate substantial revenue and employ a larger number of individuals (Fenn et al., 1997). These companies may require PE financing to fund acquisitions, purchase new plants, or modify their ownership or capital structure. The middle market has become an attractive area for PE funds due to its

fragmentation, which enables companies to grow organically through acquisitions (Costabile & Pollack, 2022). Furthermore, due to the smaller size of these firms, they are in a favorable position to take advantage of new technology and opportunities to expand and capture market shares, often requiring third-party financing from PE funds. Overall, growth equity serves as a means for established middle market companies to secure financing to fund their growth and expansion plans, making it a vital part of the larger PE asset class.

The third type of companies that seek PE funding are public and private firms in financial distress. In the case of public firms, partnering with PE firms is often used as a turnaround strategy in which the PE firms receive controlling interest in exchange for an inflow of new capital (Fenn et al., 1997). Distressed public companies often seek PE financing, as they are generally reluctant to issue public equity because of the significant discount required to attract investors. In addition, firms with high associated risks are often excluded from the debt markets. As a result, these companies often approach PE firms with a willingness to assume risk and offer resources to invest in exchange for an ownership stake and the possibility to influence the company's direction.

The fourth category of PE funds consists of Buyout (BO) funds. BO funds represent a substantial portion of the PE landscape, accounting for two-thirds of all PE funds invested (Metrick & Yasuda, 2010). BOs take place when a PE fund acquires a mature company, either publicly traded or privately held. In cases where the acquired company is publicly traded, the transaction is commonly referred to as a public-to-private deal. The most common type of BO is a Leveraged Buyout (LBO), where high levels of debt are used to finance the acquisition cost. A subcategory of Buyouts (BOs) is Management Buyouts (MBOs), which represent a specific type of buyout in which the company's existing management team acquires the company from its current owners. MBOs are relevant for PE funds, as they often play a role in financing such transactions.

Although LBOs and MBOs involve substantial leverage, the objective is not to create a firm that teeters on the brink of bankruptcy. Instead, the leverage serves as a means to achieve certain goals, such as incentive alterations and reducing tax payments. In order to obtain the required leverage, the target firm's assets are often used as collateral for loans in conjunction with the PE fund's capital injection. The investment strategy of BO funds involves acquiring a controlling interest in the target company to implement operational changes to enhance efficiency and minimize unnecessary expenses (Kaplan & Strömberg, 2009). Implementing these operational changes aims to enhance the firm's value, enabling its subsequent resale at a

higher price and ultimately generating returns for the LPs. Still, there are risks associated with BOs because of the high levels of debt involved. Thus, the new capital structure of the target firm makes it especially exposed to market downturns and shocks (Kaplan & Strömberg, 2009). Regardless of the associated risks, BO funds remain the most popular (in terms of investment value) subcategory of PE.

Finally, a subset of PE funds specializes in financing public companies with unique funding needs that cannot be fulfilled through public equity markets or debt. Fenn et al. (1997) offer three examples of situations where such funds may be utilized. First, public companies may require small amounts of equity financing for various purposes, which can be more cost-effective to obtain through PE than public markets. Second, PE funds may provide financing for complex company strategies unsuitable for unsophisticated investors but comprehensible to experienced PE fund managers. Lastly, public companies may turn to private equity funds for funding during periods of temporary loss of access to public markets. In some cases, investors may avoid specific sectors or markets due to skepticism and herd mentality. In these instances, PE funds can step in to fulfill financing needs at a premium to public markets.

3. PRIVATE EQUITY'S ECONOMIC IMPACT

In an academic context, an important question when examining PE is its applicability beyond its role as an investment vehicle for LPs seeking returns. Therefore, to establish the relevance of this research, it is crucial to examine the broader economic implications of PE. As such, this section will start with a discussion of the economic implications of VC. The economic consequences of LBOs and MBOs will also be studied, emphasizing the alterations in capital structure leading to incentive adjustments and firm performance post-acquisition.

3.1 Venture capital's contribution to economic development

When examining the fundamental impact of VC on economic growth, Samila and Sorenson (2011) highlight two critical aspects. The first pertains to whether VC enhances the efficiency of capital allocation within the economy. This involves examining whether the new firms that receive VC funding would have been able to secure financing from alternative sources if VC funds were not present in the economy. The second aspect concerns the added value provided by VC funds beyond the invested capital, encompassing guidance and networking advantages. Consequently, this aspect investigates whether VC funds contribute additional value to firms beyond their function as allocators of capital.

Regarding the first perspective, evidence suggests that resource constraints might lead to lower levels of entrepreneurship. The impact of liquidity limitations was pioneered by Knight in 1921, who argued that capital markets supply insufficient funding to entrepreneurs due to moral hazard and adverse selection issues (Watkins, 1922). Therefore, to a certain degree, entrepreneurs depended on self-financing and carrying the majority of the risk. This observation implies that capital markets do not possess the necessary mechanisms to effectively transfer risks away from entrepreneurs, thereby posing a limiting factor for innovation.

In more contemporary literature, Evans and Jovanovic (1989) find that wealthier individuals are more inclined to become entrepreneurs as they have more capital disposable to risk. Similarly, Blanchflower and Oswald (1998) discovered a positive correlation between inheritance size and the decision to become an entrepreneur. In addition, Kotze and Smith (2008) attributed the low levels of entrepreneurship in South Africa to the high debt and low savings of the population. Therefore, the empirical evidence suggests that VC can have a positive economic impact by acting as a resource allocation mechanism in the economy.

In terms of the value-added contribution of VC funds beyond capital allocation, Berger and Udell (1998) emphasize a tacit agreement between VC funds and new firms. This arrangement entails not only an infusion of capital from the fund but also management advice to address the non-technical deficiencies of young firms. The provision of advice is especially crucial for firm growth, given that the scaling process requires founders to transition from creators to managers. The value of managerial advice is evident in Jain and Kini's (1995) research, which found that VC-backed firms had higher cash flow and sales growth after an Initial Public Offering (IPO) than non-VC-backed firms. Engel and Keilbach (2007) also report that VC-funded firms experience significantly greater organizational growth, as measured by employment figures.

VC funds also offer an extensive network of service providers to help their portfolio companies succeed (Gorman & Sahlman, 1989). These service providers include law firms, financiers, investment banks, and government officials. Research conducted by Hochberg et al. (2007) shows that VC funds with better networks are associated with higher returns, indicating the superior performance of their portfolio companies. Sorenson and Stuart's (2001) research also highlights the benefits of VC firms in providing access to potential customers, suppliers, and other business partners. This access can be instrumental in facilitating portfolio firms' growth and success in the early stages. In summary, these findings demonstrate the critical role of VC funds beyond their primary function as financiers and highlight the broader benefits that their networks provide to portfolio companies.

3.2 The economic impact of LBOs, MBOs, and PE restructuring

To structure this section, the analysis will initially focus on the effects of leverage on a firm's capital structure and the resulting incentive implications for management and investors. Following this, the post-acquisition performance of target firms after an LBO or MBO transaction will be examined. Finally, the potential disadvantages associated with the cyclical nature of PE, potential adverse outcomes of LBOs, and critiques of PE restructuring practices will be investigated.

Jensen (1986; 1988) asserts that shifts in incentives are the primary drivers of increased performance in the context of analyzing the economic impact of LBOs and MBOs. First, the increased debt-to-equity ratio associated with LBOs and MBOs can limit resource waste and

compel organizational management to focus on efficient resource allocation. This occurs as the high-interest payments decrease the flexibility for management to misuse the firm's cash flow, potentially enhancing discipline. Second, high leverage may strengthen owners' incentives to perform by increasing the possible return on equity. Third, PE funds that engage in LBOs and MBOs become larger blockholders, incentivizing close monitoring of management performance. Lastly, the majority share enables the PE fund to intervene and replace the management if the firm is underperforming. Consequently, the altered capital structure leads to shifts in incentives, which are considered crucial factors in the improved performance stemming from LBOs and MBOs.

The post-acquisition performance of portfolio firms is an important point to examine, as it signals efficient resource utilization and can contribute to economic development. According to Kaplan (1989), firms that undergo an LBO experience a 24 percent increase in operating income three years post-LBO, primarily driven by an increase in revenue rather than cost-cutting. Multiple studies, including Muscarella and Vetsuypens (1990) and Opler (1992), have found similar results regarding post-LBO acquisition, where an increase in revenue is observed without significant changes in costs. Similarly, Bergström et al. (2007) research on PE-sponsored buyouts in Sweden reveals improved firm performance without significant wage reductions or labor force restructuring. Overall, these findings indicate that the enhanced performance following an LBO can be primarily attributed to more efficient management practices, leading to increased revenues rather than cost-cutting measures such as employee layoffs.

Studies on MBOs have also reported positive effects on firm performance. For instance, Wright et al. (1994) found that UK firms that underwent a MBO showed increased profitability and improved working capital control. Similarly, Lichtenberg and Siegel (1990) discovered an 8.3 percent increase in total factor productivity for manufacturing plants that underwent a MBO, outpacing the industry average after three years. One concern often raised concerning LBOs and MBOs is that cost-cutting measures may disproportionately impact blue-collar workers. However, Lichtenberg and Siegel's (1990) study showed that these measures tended to affect white-collar labor rather than blue-collar workers and did not significantly affect Research & Development (R&D), wages, or investments.

The adverse effects of PE have been noted by Axelson et al. (2009) by emphasizing its procyclical nature. The study developed a theoretical framework suggesting that GPs are incentivized to invest in unprofitable projects during times of high credit availability, leading

to adverse economic effects. Moreover, Amess and Wright (2012) observed a 3 percent reduction in employment two years after a PE acquisition. Additionally, Hotchkiss et al. (2011) found that PE-backed firms experiencing financial distress had a higher probability of default compared to non-PE-backed firms. Nevertheless, it is worth noting that PE-backed firms appeared to perform better after bankruptcy, requiring less time to restructure and increasing the likelihood of firm survival.

3.3 Overview of private equity's economic implications

The reviewed literature indicates that VC serves as a positive resource allocation mechanism by aligning capital with innovation. In addition, VC funds were found to provide additional value to founders through managerial advice and network. LBOs and MBOs have been demonstrated to cause shifts in incentives because of changes in capital structure, which could positively influence firm performance. The majority of the literature also suggests that both LBOs and MBOs have a positive impact on firm performance post-acquisition, with the most significant changes being increased revenue without substantial workforce reductions. Nevertheless, the procyclical nature of PE, some potentially adverse findings in the aftermath of LBOs, and the higher probability of bankruptcy for PE-backed firms have also been observed.

In summary, the predominant consensus within the reviewed literature suggests that the advantages of PE surpass its potential drawbacks, likely leading to a net positive effect on the economy. As a result, PE can be recognized as an asset class that positively influences capital allocation, resource utilization, and firm performance. Therefore, further research on the PE landscape in the Nordic region is warranted, as it holds academic significance and may prove valuable for policy formulation.

4. THE NORDIC REGION

In this section, the unique characteristics of the Nordic region and an overview of the countries' respective economies will be presented. Geographically, the Nordic region comprises five countries, namely Denmark, Norway, Sweden, Finland, and Iceland. However, academic and business literature often omits Iceland from PE analyses of the Nordic countries (Argentum, 2022; Spliid, 2013). This exclusion is likely attributable to Iceland's significantly smaller population and GDP, as well as its limited PE activity compared to the other Nordic nations. Based on the justifications presented in the existing literature and to narrow the scope of the research, the decision has been made to exclude Iceland from this analysis. Thus, for the purpose of this study, the term "Nordic countries" will only refer to Denmark, Finland, Norway, and Sweden unless specified otherwise.

4.1 The Nordic particularities

The Nordic countries possess numerous commonalities that warrant considering them as a distinct market separate from the rest of Europe. One of the primary factors is the linguistic connection between Norway, Sweden, and Denmark, with their languages all originating from Old Norse. In contrast, Finnish belongs to the Uralic language family, which significantly differs from other Nordic languages (Latomaa & Nuolijärvi, 2002). Despite this linguistic disparity, Finland has built strong cultural ties with the Nordic region, attributable to its association with the Swedish kingdom for over 600 years (Nordenskiold, 1919). As a result, Finland acknowledges Swedish as an official language alongside Finnish, reflecting its historical and persistent connections with the Nordics (Latomaa & Nuolijärvi, 2002). Therefore, the Nordic countries demonstrate a distinct linguistic relationship that sets this region apart from other European nations.

Besides the language connection, the Nordic countries have adopted a governance approach commonly referred to as the Nordic Model. The terminology for this model has evolved over time; it was initially referred to as the Swedish Model, subsequently the Scandinavian Model, and presently, the Nordic Model is recognized as the most widely accepted term (Mouritzen, 1995). The model is typically characterized by small and open economies with minimal wage disparities, high productivity, elevated taxation, and an extensive welfare state. Barth et al. (2014) ascribe the model's success and resilience within the region to the complementarity between free-market capitalism and significant collective bargaining power for workers,

combined with welfare redistribution. Consequently, the social and economic framework in the Nordic countries diverges from that of other contemporary European nations.

The Nordic countries also share a similar legal system, often referred to as Scandinavian law. However, Wahlgren and Bernitz (2007) contend that a more fitting term would be Nordic law, as the legal framework encompasses the entire Nordic region, not merely the Scandinavian countries. The collaboration was formalized through the Helsinki Agreement of 1962, which established five primary principles of partnership: legal, cultural, social, economic, and communications (Wahlgren & Bernitz, 2007). Because of the legal similarities between the Nordic countries, domestic firms have considerable cross-border activity within the Nordic region. Furthermore, the distinct legal system presents an additional rationale for considering the Nordics as a separate market within Europe.

One characteristic that sets the Nordic countries apart from the rest of Europe is their significant focus on innovation. A review of international rankings reveals that the Global Innovation Index, published by the World Intellectual Property Organization, places Sweden, Finland, and Denmark among the top 10 (Dutta et al., 2022). Conversely, Norway is ranked considerably lower at number 22. Despite this, the Nordic region's average ranking is still relatively high within a global context.

Amplifying the Nordic region's innovative capabilities, Maliranta et al. (2012) argue that these countries have fostered innovation at levels that are comparable to, or even exceeding, those of the United States (US). The authors base their claims on the region's higher patent generation, R&D expenditure, number of researchers, and VC investments (adjusted for population and economic size) relative to the US. The analysis, however, excludes Norway due to its abundant natural resources. Nonetheless, the Nordic region's robust innovation capabilities set it apart from the rest of Europe, underscoring its distinctive position within the continent.

4.2 The Nordic economies

A shared characteristic of the Nordic economies is their close relationship with the European Union (EU). Finland, Sweden, and Denmark are member states of the EU, with Finland being the sole member country of the eurozone. Norway cooperates with the EU through the European Free Trade Association (EFTA) agreement, granting the country access to the European Economic Area (EEA). To participate in the EEA, Norway is required to adhere to

EU legislative measures pertinent to the internal market (European Union, 2021). As a result, the legal structures of the Nordic countries remain harmonized, even as increased EU regulations are integrated into their domestic legal frameworks.

The Nordic countries also have a prosperous Gross Domestic Product (GDP) per capita. Compared to the EU, the Nordic countries have a GDP per capita above their European peers shown in Appendix A, I. While the Nordic countries share similarities in language, culture, economic models, and legal systems, they are not entirely homogenous. Each country possesses a unique economy with diverse industries and competitive advantages, allowing them to remain affluent in the global market. Consequently, in order to establish distinctions among the countries, this paper will present the populations and economies of the Nordic region.

Population size is a relevant factor to consider when examining the Nordic economies. As the largest country in the region with a population of over 10 million people, Sweden holds a significant weight in terms of the overall population size. Denmark, Finland, and Norway have similar population sizes ranging between 5 to 6 million people. Considering population size in a European context, the Nordics as a whole would be ranked between Romania (19.5 million) and Poland (38 million). Despite the relatively small population, the Nordic region's soft power and economic influence far exceed what would be expected based on population size alone.

Sweden is the largest economy in the Nordics in terms of total GDP and number three in terms of GDP per capita, illustrated in Table 1. The Swedish economy is export-oriented, with the leading industries being manufacturing and industrial engineering. According to the International Trade Administration in Sweden, the sector accounts for 20 percent of the GDP and 75 percent of exports (2022). In contrast with the rest of the Nordics, Sweden is dominated by large domestic multinational companies such as Ikea, Volvo, and H&M. In addition, Sweden has the largest financial sector in the Nordics, constituting 4.6 percent of GDP (The Swedish Bankers' Association, 2023). Consequently, Sweden's export-oriented economy, marked by a multitude of multinational corporations and a significant financial sector, sets it apart within the Nordic region.

	Rank	Country	2017	2018	2019	2020	2021
GDP (current USD, millions)	1	Sweden	541 019	555 455	533 880	541 487	627 438
	2	Norway	398 394	437 000	404 941	362 198	482 437
	3	Denmark	332 121	356 841	347 561	356 085	397 104
	4	Finland	255 648	275 715	268 508	271 837	299 155
GDP per capita (current USD)	1	Norway	75 497	82 268	75 720	67 330	89 203
	2	Denmark	57 610	61 592	59 776	61 063	67 803
	3	Sweden	53 792	54 589	51 939	52 300	60 239
	4	Finland	46 412	49 989	48 629	49 161	53 983

Table 1: GDP comparison of the Nordic countries. The table presents the total GDP (in millions, USD) and GDP per capita (in USD) for the Nordic countries during the period 2017-2021, with data sourced from the World Bank.

Among the Nordic nations, Norway possesses the second-largest economy in terms of total GDP. Relative to its Nordic counterparts, the Norwegian state occupies a notably more prominent role in the commercial sector. Approximately 35 percent of the total values listed on the Oslo Stock Exchange are state-owned, a practice that enjoys widespread support among the population as it mitigates the absence of private investors and curtails foreign influence on the economy (Lie, 2016). Furthermore, the Norwegian economy is predominantly characterized by the oil and gas industry, which constituted 50 percent of exports and 20 percent of the nation's GDP in 2021 (Jaghory, 2022). As the sole major energy exporter in the Nordic region, Norway's thriving oil and gas sector has played a pivotal role in the country achieving the highest GDP per capita among the Nordic nations.

Denmark, as the third-largest economy in terms of GDP among the Nordic countries, is primarily driven by its service sector and a smaller yet significant manufacturing industry. Small and Medium Enterprises (SMEs) form the backbone of the Danish economy, contributing to 44 percent of employment and 39 percent of the economy's value added (Sunesen & Henriksen, n. d.). The Danish economy exhibits resilience due to its minimal reliance on hydrocarbons, in conjunction with robust household, corporate, and government balance sheets (OECD, 2021a). Additionally, Denmark holds the position of having the second-highest GDP per capita among the Nordic nations.

With respect to total GDP and GDP per capita, Finland possesses the smallest economy among the Nordic countries. Historically, the nation played a crucial role as a key trading partner with the Soviet Union, serving as an intermediary in fostering economic relations

between Eastern and Western countries (Oblath & Pete, 1985). Similar to Denmark, Finland's economic foundation is anchored by SMEs with a particular emphasis on innovation. During the period from 2016 to 2018, 60 percent of Finnish firms had more than ten employees directly involved in innovative activities (Statistics Finland, 2020). This devotion to innovation has enabled Finland to become the headquarters for large multinational enterprises such as Nokia and Fortum, thereby showcasing the country's proficiency in the fields of technology and innovation.

5. PRIVATE EQUITY IN THE NORDICS

5.1 The development of private equity in the Nordics

The initial sizable surge of PE activity in the Nordic countries can be traced back to the 1990s, following the notorious decade of LBOs in the United States during the 1980s (Næss-Schmidt et al., 2020). Still, some PE activity was already present in the Nordic region prior to this boom, with the establishment of a few PE funds in the 1970s and early 1980s. At that time, Nordic funds predominantly focused on venture investments; however, the endeavor yielded disappointing outcomes (Spliid, 2013). These underwhelming results contributed to a dampened interest in the Nordic PE landscape for the subsequent decade.

The PE market witnessed a revitalization and its first substantial surge during the 1990s, when PE funds were established in Sweden, Denmark, and Finland. The primary objective of these initial funds was to capitalize on the opportunities presented by the banking crisis and its aftermath, which resulted in numerous assets being sold at discounted prices (Næss-Schmidt et al., 2020). Norway lingered slightly in integrating the PE asset class into its market, with the first domestic funds emerging in the 2000s. Contrary to the trends in the Anglo-Saxon markets, which were dominated by bond-financed LBOs and primarily focused on public-to-private buyouts, Nordic PE funds concentrated on "carving-out" deals utilizing reduced leverage (Kaplan & Strömberg, 2009; Spliid, 2013). This alternative investment strategy entailed acquiring multiple smaller firms to form a conglomerate, thereby enabling the exploitation of synergies, economies of scale, and enhanced market power.

During the mid-1990s, foreign PE funds entered the Nordic markets by adopting the public-to-private strategy prevalent in their domestic markets (Spliid, 2013). These foreign funds primarily targeted high-technology industries and collaborated with domestic banks to secure leverage for acquisitions. However, the majority of the invested companies succumbed to bankruptcy amid the IT bubble, culminating in substantial credit losses for Nordic banks and a subsequent decline in foreign PE activity in the Nordic region (Næss-Schmidt et al., 2020). The market continued to be dominated by Nordic PE funds, as the deal sizes in the Nordic region were often deemed too small to attract Anglo-Saxon PE funds (Spliid, 2013). Despite this, cross-border PE investment activity remained high among Nordic PE funds within the region, encouraged by the reduced competition from foreign funds.

5.2 The Nordic private equity market from a global perspective

Throughout this paper, the term “Anglo-Saxon markets” will be used recurrently. The term is closely associated with Hall and Soskice’s (2001) description of Liberal Market Economies (LMEs), wherein firms principally coordinate their activities through competitive market arrangements, decentralized decision-making, flexible labor markets, and shareholder-oriented governance. Furthermore, LMEs typically exhibit greater shareholder rights (La Porta et al., 1998). Siepel and Nightingale (2014) also contend that the Anglo-Saxon market permits higher managerial risk-taking compared to other global markets, thereby increasing the overall riskiness of these economies. Countries that typically exhibit the Anglo-Saxon LME model are the UK, the US, Canada, and Australia.

In contrast, Hall and Soskice (2001) depict the Coordinated Market Economy (CME) as a governance model distinguished by non-market-based coordination, more rigid labor markets, and stakeholder-centric governance. Unlike LMEs, CMEs generally have weaker shareholder rights but exhibit more comprehensive creditor rights (Djankov et al., 2007). European nations, including Germany, Austria, Switzerland, and the Nordic countries, are examples of countries adopting the CME model.

The majority of academic literature addressing PE is derived from research conducted in Anglo-Saxon markets, with the US and the UK serving as the primary sources for much of the data employed in these studies. As depicted in Table 2, the combined share of the United States and the United Kingdom amounts to approximately 70 percent of the total BO investment value among the world’s most prominent BO markets. Furthermore, all conventional LMEs occupy positions within the top ten ranks globally concerning BO volumes. Consequently, it is understandable that the US, the UK, and other LMEs garner the majority of academic focus in the realm of PE, considering the significant activity in these markets.

Utilizing the same data presented in Table 2, the Nordic countries collectively rank as the sixth largest in terms of buyout investment value. Given the population size of the Nordic region, these countries significantly outperform expectations compared to other CMEs. When contrasting with Germany, another CME with a population exceeding 80 million, the Nordic countries display a substantially higher investment value per capita. Even in comparison with

LMEs, the Nordic region holds its own, closely aligning with the UK. Therefore, the Nordic region can be regarded as a relatively active PE market within the global context.

Value of buyout PE deals worldwide from 2019 to 2022, by target country & region (in billion U.S. dollars)

Country	2019	2020	2021	2022	Sum	Percentage of total
United States	460	475	1 044	697	2 675	59,21 %
UK	74	113	166	84	437	9,66 %
China	56	63	100	40	259	5,72 %
France	40	38	92	59	229	5,07 %
Germany	38	53	71	34	196	4,34 %
The Nordics	26	40	80	26	172	3,81 %
Italy	13	22	55	75	165	3,65 %
India	20	24	56	34	134	2,98 %
Australia	14	15	82	21	132	2,92 %
Canada	44	24	28	23	120	2,65 %
Sum	**785**	**867**	**1 774**	**1 093**	**4 518**	**100,00 %**

Table 2: Depiction of the top nine largest national BO markets worldwide and the Nordic region.
The data are sourced from the American law firm White & Case's database.

Although the Nordic region can be deemed relatively large from a global perspective, there is a notable scarcity of academic studies focusing on this market. This limitation gives rise to the issue of transferability concerning the numerous articles originating from Anglo-Saxon markets, which can be ascribed to the unique characteristics that differentiate LMEs from CMEs. Moreover, the transferability of PE research conducted on other CMEs is limited due to the specific nuances of the Nordic region, as discussed in the preceding section. Consequently, there is a pressing need for additional research on the Nordic PE market to further clarify the mechanisms driving its investment volume.

5.3 The distinctiveness of the Nordic private equity market

In Spliid's (2013) article "Is Nordic Private Equity Different?", the similarities and disparities between the Nordic countries and the US (as a representative of the Anglo-Saxon markets) are examined. As previously mentioned, there is a shortage of academic research on the Nordic PE market, and Spliid's (2013) paper has served as a cornerstone for this study. However, given that the research was published a decade ago, it is crucial to reevaluate its central arguments in light of contemporary regulatory developments and updated research.

Spliid (2013) initially highlights the similarity between the US and the Nordics in terms of institutional development and protection of property rights. Although the evidence provided is

persuasive, the ranking utilized in the research may no longer accurately represent the current landscape. Nevertheless, the International Property Rights Index (IRPI) continues to rank the Nordics and the US as global frontrunners in property rights protection, with the complete ranking available in Appendix B (2022). Notably, the Nordic countries surpass both the US and the UK in the latest ranking, shown in Table 3. Thus, the results suggest that property rights and institutional development should not be viewed as a barrier to PE development in the region. Moreover, property rights do not appear to present a significant distinction between the Nordics and other Anglo-Saxon markets.

	Finland	**Denmark**	**Sweden**	**Norway**	**United States of America**	**United Kingdom**
IPRI	8.173	7.806	7.601	7.798	7.566	7.299

Table 3: International Property Rights Index (IRPI) comparing the Nordic countries to the US and UK.
The table presents the 2022 IRPI scores. A complete ranking that encompasses all related factors can be found in Appendix B.

Spliid (2013) also identifies the high political focus on PE in both the Nordics and the US as a similarity, particularly in terms of limiting tax benefits for PE. To date, no significant changes have occurred in tax regulations regarding the deductibility of interest expenses on heavily leveraged firms, which remain relatively similar in the US and the Nordics. However, a growing disparity has been observed in the taxation of carried interest, which represents a GP's proportion of the profits generated by the fund.

Currently, there is an apparent trend within the Nordic region to tax carried interest as employment income, which is subject to a higher tax rate, as opposed to considering it as investment income. Sweden has been at the forefront of this shift, with similar developments being proposed in Denmark (Mazanti Pulse, 2019; Williams, 2018). However, Norway and Finland continue to levy taxes on carried interest as investment income (Klemettilä & Björkeson, 2017; Nordbø, 2015). In contrast, the US still treats carried interest as risk capital and thus subjects it to capital gains taxation. Consequently, there is a more pronounced disparity between the US and some of the Nordic countries concerning fund manager compensation and thereby shaping GPs' incentives for returns.

Spliid (2013) contends that there are significant differences in cultural aspects, investment environment, and access to equity and credit between the US and the Nordic region. Firstly, with regard to cultural aspects, it is suggested that the US is more performance-centered and motivated by financial incentives than the Nordics, drawing on the frameworks of Hofstede's

(1984) cultural dimensions and House et al. (2005) in their GLOBE studies. However, using such frameworks has been criticized for oversimplifying the complexity of culture (Shaiq et al., 2011; Venaik & Brewer, 2013). Moreover, no direct research substantiates the claim that performance and rewards differentially impact Nordic and American employees at the individual level. Consequently, the argument may be overly simplistic and lack robust empirical evidence to support its assertions.

In terms of access to equity for fundraising, Spliid (2013) contends that the Nordic region lacks domestic investors in comparison to the US, which can rely predominantly on its home market to fulfill the necessary capital inflow. As a result, Nordic PE funds need to establish offshore funds to accommodate the various tax framework disparities among foreign investors. However, this does not appear to pose a significant challenge based on recent fundraising trends and capital inflow for PE funds in the region. In fact, the Nordic region experienced the highest amount of PE fundraising per capita compared to other European countries, including the UK (Krantz et al., 2022). Furthermore, future fundraising prospects appear promising, with Nordic funds reporting record fundraising pipelines for 2022 (Argentum, 2022). Consequently, fundraising does not seem to be a constraint for Nordic PE funds.

Spliid (2013) also contends that the investment environment in the Nordic region is considerably less favorable for PE activity compared to the US. Firstly, the extensive government control over infrastructure restricts the number of potential firms available for acquisition by PE funds. Additionally, the state's active ownership in numerous listed companies diminishes stock market turnover. There have been minimal changes in the control of public infrastructure and State-Owned Enterprises (SOEs) in the Nordic countries. Notably, Norway exhibits the highest proportion of employees working for SOEs among all OECD countries, with Finland and Sweden also ranking within the top ten (OECD, 2017). Consequently, the implications of these policy practices continue to be relevant in the contemporary Nordic PE market.

It is also argued that the limited stock market development in the Nordics is a hindrance for PE funds. The Financial Development Index (FDI) is a global ranking of a country's financial markets and institutions (IMF, 2022). The figure below presents the average score for the Nordics, the US & UK, and the EU for 2013-2020. Subsequently, there is still a large discrepancy in both the institutional and financial market development between the Nordic

and Anglo-Saxon countries. However, the differences are minor compared to those between the EU and the US & UK, indicating even more significant deviation.

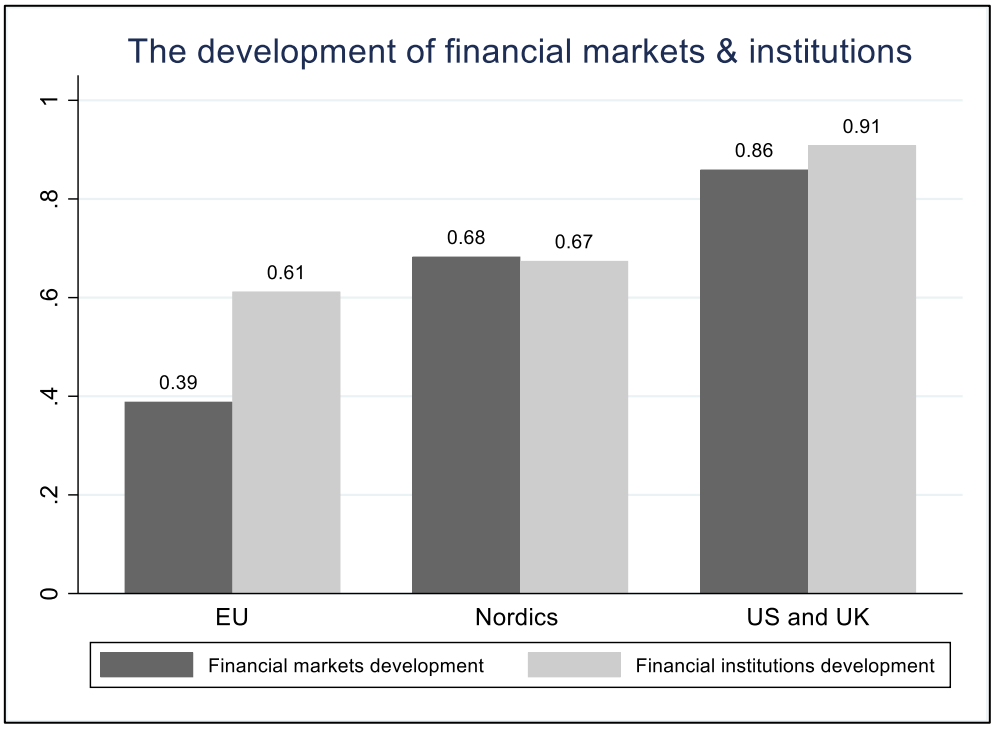

Figure 1: Development of Financial Markets and Institutions in the Nordic Region, EU, and the US & UK. The data are collected from the IMF's Financial Development Index (FDI) and represent the average scores for each region during the period 2013-2020.

Lastly, Spliid (2013) argues that access to credit is more constrained in the Nordics compared to the US. The primary reason for this discrepancy is that American PE funds predominantly rely on non-investment grade bonds in conjunction with bank financing, while Nordic PE funds depend exclusively on banks. Within the European context, non-investment grade bonds are typically employed in large-scale transactions, often involving investments exceeding 300 million euros (Peveraro, 2018). Consequently, the argument suggests that the typical deal size in the Nordics is too small to employ non-investment grade bonds.

Figure 2 displays the size difference in deal volume in the Nordics for BO investments from 2007 to 2021. During this period, only 28 mega-deals transpired, which would have been eligible for leveraging high-yield bonds. Generally, deal sizes in the Nordics primarily consist of small and lower mid-market transactions, constituting the most significant portion of investments. Consequently, the deal sizes continue to indicate a substantial divergence between credit sources in the US and the Nordics, with the latter exhibiting a greater reliance on banks for credit extension in LBOs.

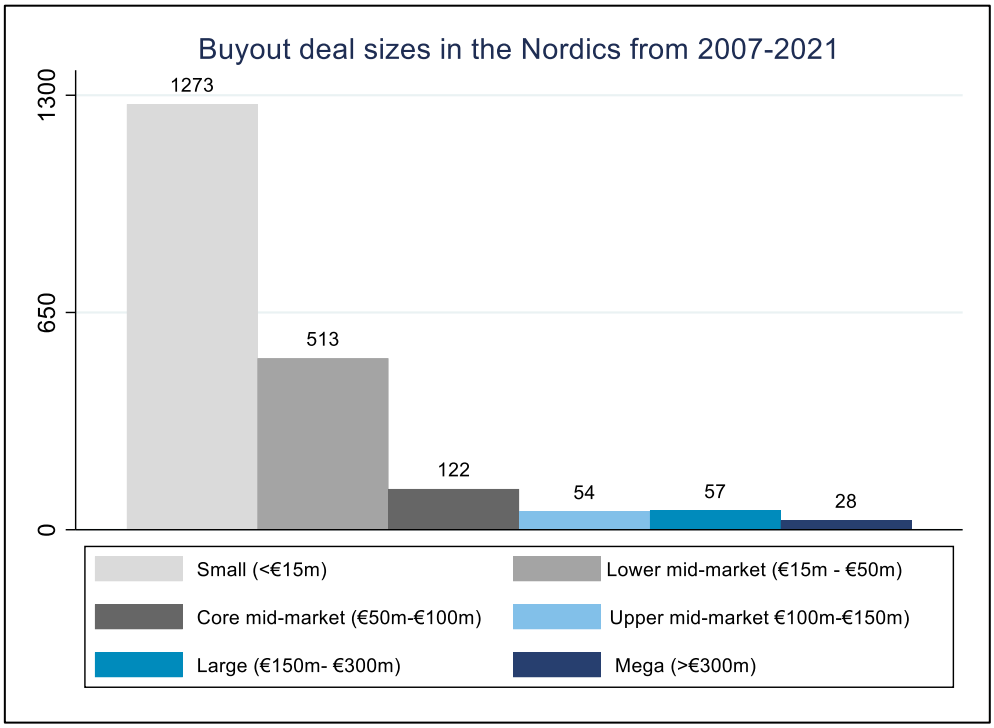

Figure 2: Buyout deal sizes in the Nordic region for the period 2007-2021. The data used for the illustration were provided by Invest Europe.

In conclusion, many of Spliid's (2013) assertions remain pertinent in characterizing the distinct features of the Nordic PE market that set it apart from Anglo-Saxon markets. The similarities revisited and reaffirmed in this section include the parallels in institutional development, property rights, and taxation of highly leveraged firms that continue to hold relevance in the contemporary context.

Examining the differences, a more pronounced divergence has emerged concerning the taxation of carried interest. In terms of cultural differences, the argumentation is not supported by empirical evidence, and the assumed constraints on Nordic PE funds' fundraising capacities do not align with recent developments. However, significant discrepancies continue to exist in the investment environment due to the presence of SOEs and financial market development, combined with limited access to credit, distinguishing the Nordic PE market from LMEs.

5.4 Preliminary analysis of private equity investment activity in the Nordic countries

In this section, a closer examination of the Nordic countries' individual investment volumes will be analyzed. Invest Europe, formerly known as European Private Equity and Venture Capital Association (EVCA), provided the data for all illustrations in the upcoming sections. Figure 3 illustrates the total value of PE investment from domestic funds in each of the Nordic countries for the years 2007-2021. The aggregate PE investment volume is the sum of VC, BO, growth, replacement, and turnaround capital deployed in each country.

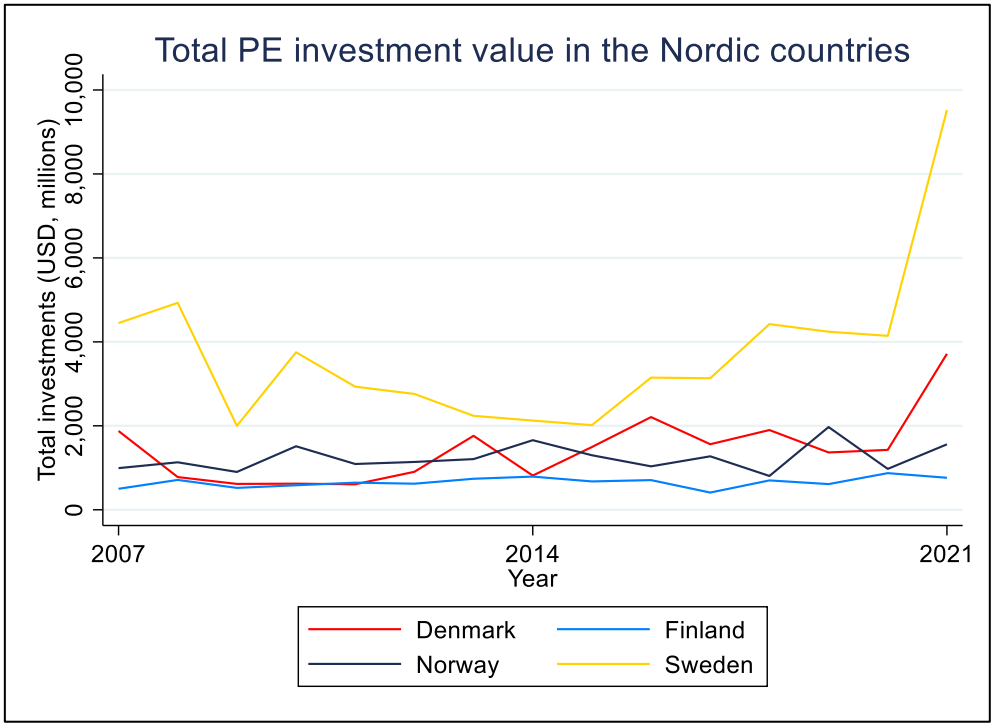

Figure 3: Total PE investment value in each of the Nordic countries. The figure illustrates the total investment value by country carried out by domestic funds during the period 2007-2021. Invest Europe provided the data.

Upon examining Figure 3, it is evident that Sweden has the highest volume of PE investments among all the Nordic countries. This outcome is expected, given that Sweden has twice the population of the other Nordic countries and the largest economy as measured by GDP. Denmark and Norway exhibit the second-largest investment activity, with Denmark surpassing Norway in recent years. While having the lowest PE investment value, Finland displays comparatively less volatility and a more stable year-on-year stream of PE investments.

As demonstrated in Table 2, the UK holds its position as the largest PE market in Europe and ranks as the second largest globally, following the US. Figure 4 displays the PE investments of the Nordic countries, adjusted for total GDP, with those of the UK. The data indicate that the relative PE investments in all the Nordic countries are substantially lower in comparison to the UK. As a result, the Nordic countries, given their high GDP, still do not match the level of advanced LMEs like the UK in terms of PE activity.

Focusing on the Nordic countries, Sweden still has the most prominent investment activity even when adjusted for GDP. For the second most active PE market, Denmark seems to surpass Norway when standardizing the size of the economy. Lastly, Finland demonstrates the lowest level of PE investment activity among the Nordic countries, even after accounting for its smaller economy.

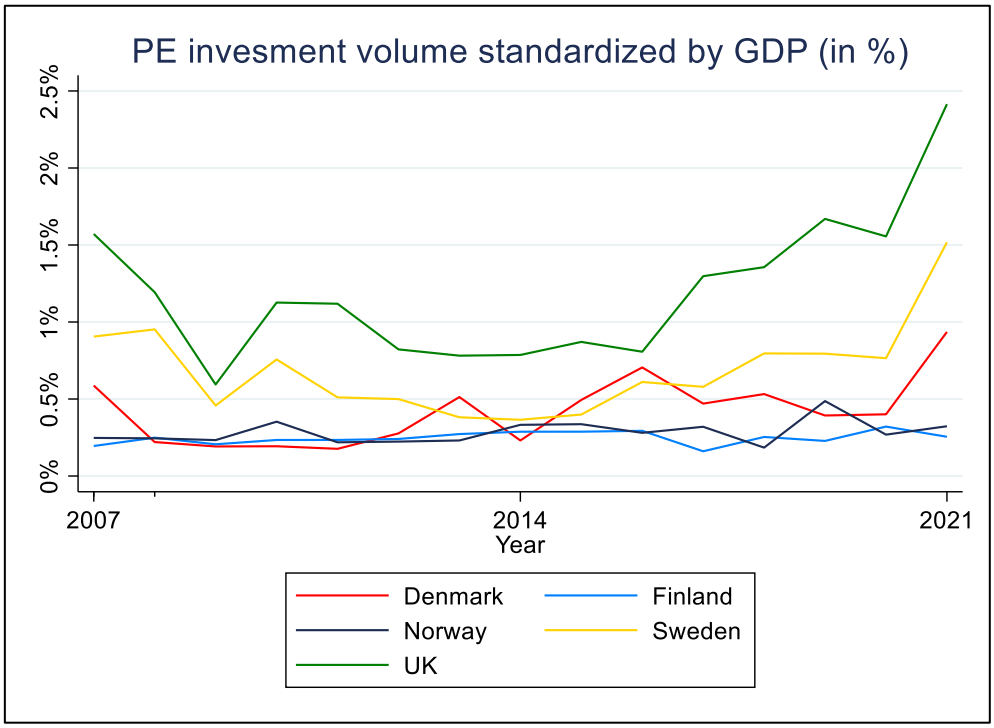

Figure 4: Total PE investment value, standardized as a percentage of GDP, for the Nordics and the UK. The investment values for PE are provided by Invest Europe, while the GDP figures are obtained from the World Bank.

When comparing the Nordic countries to the UK, it may inadvertently give the impression that the Nordics are underdeveloped PE markets. As such, it is reasonable to compare the region with other CMEs. Figure 5 contrasts the Nordics and the EU in terms of total PE investment value, standardized by GDP. Upon comparison, the Nordics appear to have a considerably more active PE investment environment than their European counterparts.

However, when excluding Sweden from the Nordic countries (represented by the dotted line), the Nordic average becomes more similar to that of the EU. Additionally, the illustration underscores the dominance of Sweden as the leading PE market in the Nordics.

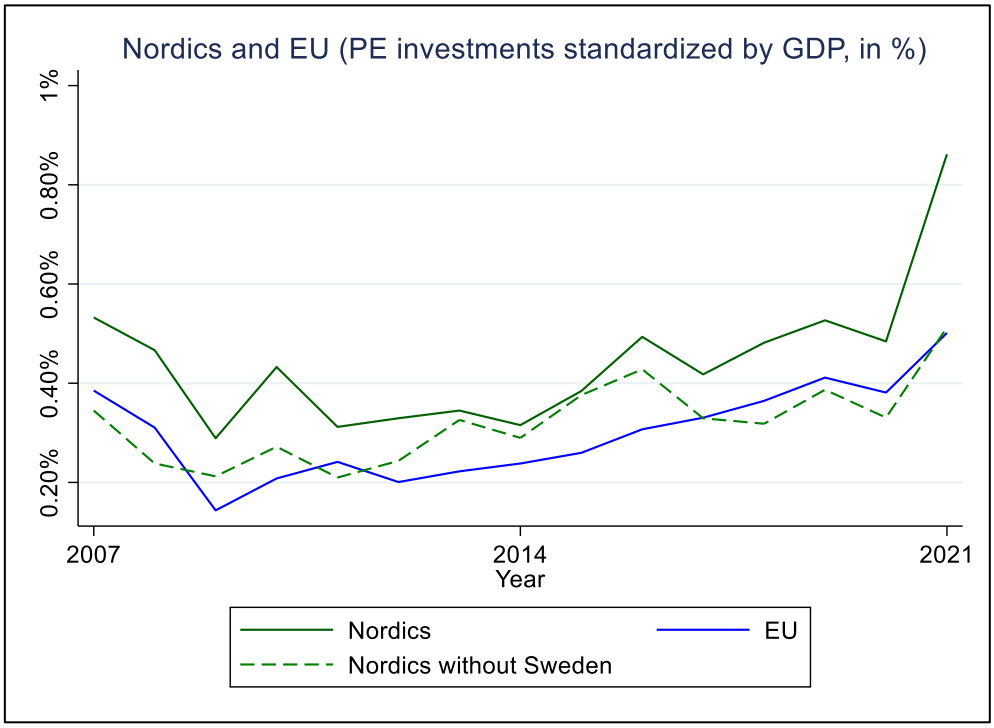

Figure 5: Comparison of PE investment value standardized by GDP of the Nordic region (including and excluding Sweden) to the EU. The data for PE investment value for the Nordics and the EU were provided by Invest Europe, while GDP figures were obtained from the World Bank.

5.5 Distribution of private equity investments in the Nordic region

After analyzing the total PE investment activity, it is fundamental to further examine the distribution of activity across various types of PE investments within the Nordic countries. Figure 6 below illustrates the percentage mean of VC, BO, and other investments as a proportion of the total PE investment volume conducted by domestic PE funds in the period 2007-2021. VC investments encompass all venture funds, including seed, start-up, and later-stage ventures. BO investments constitute a separate category, as they account for the largest portion of the total PE market. The final category is the other investments, which comprise the aggregate investment volume of growth, turnaround, and replacement capital.

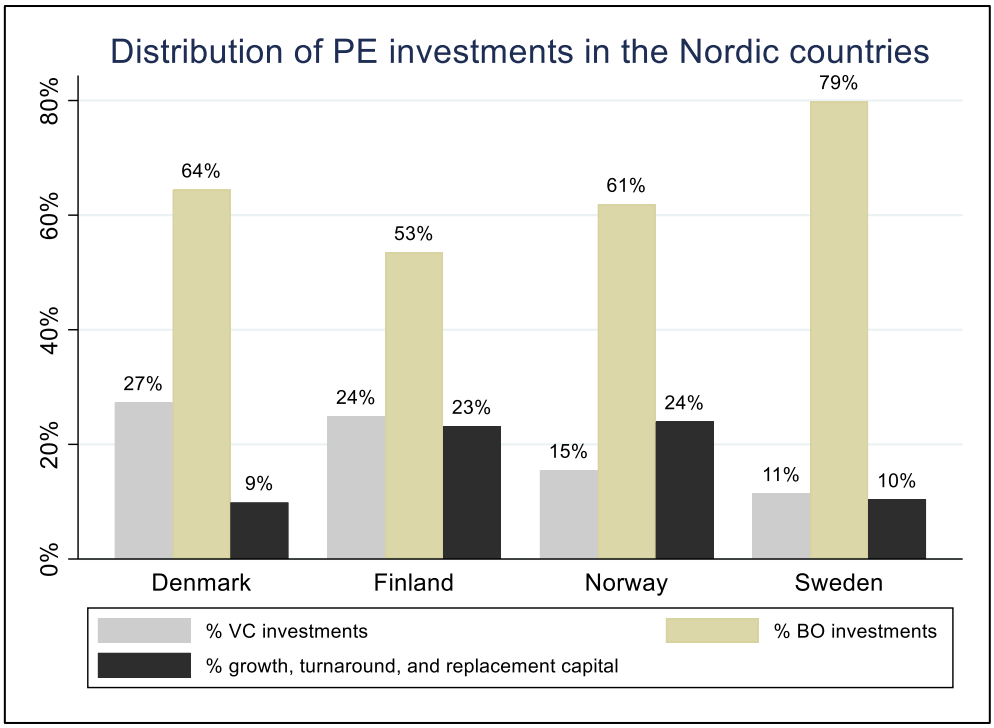

Figure 6: Distribution of VC, BO, and other PE investments in the Nordic countries. The figure depicts the mean proportions of VC, BO, and other investments as a share of total PE investment value for the Years 2007-2021. The figure is based on data provided by Invest Europe.

In Sweden, BO deals comprise the most substantial portion, averaging 79 percent of the total PE investment value in the economy during the specified period. This is consistent with Sweden being the largest PE market, as BOs generally involve the largest transaction value. Denmark and Norway exhibit relatively lower BO investment activity, averaging 64 and 61 percent, respectively. Finland has the least BO investment activity among the Nordic countries, averaging approximately 50 percent of the total PE investment value.

Examining the proportion of VC investments, Denmark has the largest share of VC investments relative to the total PE capital deployed in the economy, averaging approximately 27 percent during the selected period. Finland closely follows Denmark with an average of 24 percent. Norway and Sweden exhibit lower VC investment activity, averaging 15 and 11 percent, respectively. Overall, VC activity in the Nordic region appears to display significant cross-country variation.

Lastly, the other investments category is examined, which includes the sum of growth, turnaround, and replacement capital deployed. It becomes evident that these types of investments are generally less prominent in the Nordic countries compared to VC and BO investment activity. The exception is Norway, where the value exceeds VC investments. Finland also exhibits some activity in this area, averaging around 20 percent of the total

investment activity. These deals are less prevalent in Denmark and Sweden, accounting for about 10 percent of the PE investments in their respective economies.

From a European perspective, Figure 7 compares PE deal distribution in the EU, Nordic countries, and the UK. VC investment makes up a far more significant portion of the total PE investment in the Nordic than in the UK, but only slightly larger than in the EU. Notably, VC accounts for a greater portion of replacement, growth, and turnaround capital, distinct from the UK and EU. This is presumably due to the relatively significant emphasis on innovation in the Nordic region, leading to increased venture capital activity.

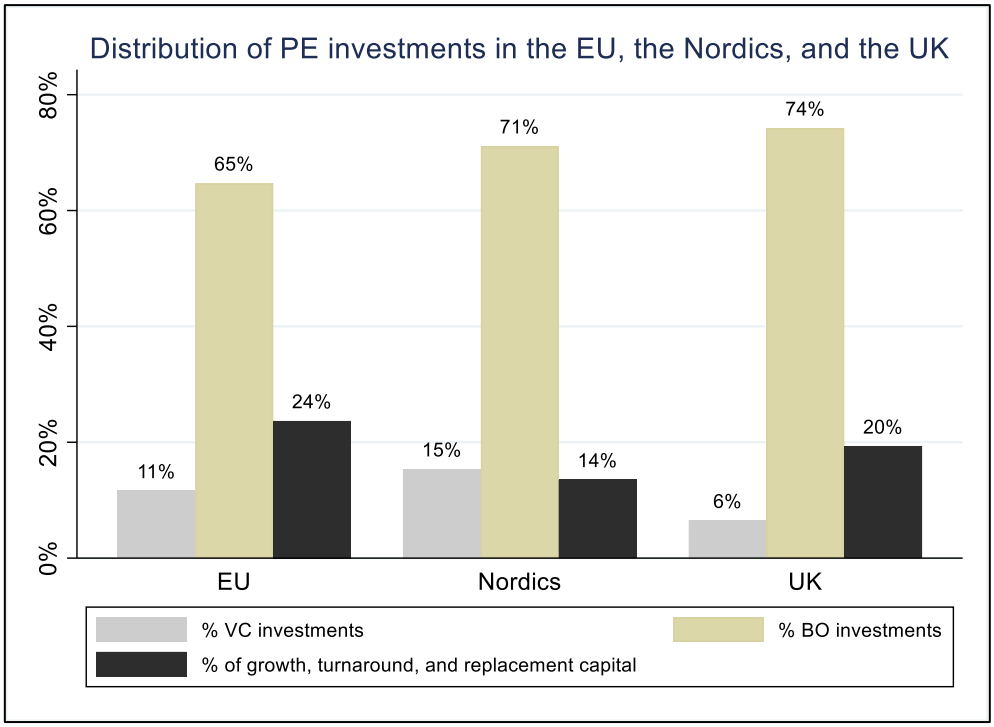

Figure 7: PE investment deal distribution in the EU, Nordic Region, and UK. The figure depicts the average proportions of VC, BO, and growth, turnaround, & replacement capital of total PE investments for the years 2007-2021. The data were provided by Invest Europe.

Regarding the portion of BO investment activity, the Nordic countries are more aligned with the UK than the EU. However, the differences among the three regions are relatively minor, as BOs constitute the largest share of each region's PE investment volume. Interestingly, it appears that the most active PE markets (in terms of GDP proportion) exhibit a more significant BO investment activity. This observation is supported by the comparison between Sweden (as shown in Figure 6) and the UK (as depicted in Figure 7), which are the two most active markets in the analysis. In both cases, buyouts account for over 70 percent of the investment value.

In the comparative analysis, the Nordic countries display the lowest levels of growth, turnaround, and replacement capital activity. Notably, these types of investments constitute the smallest proportion in the Nordic region. In contrast, growth, turnaround, and replacement capital hold the second position in both the UK and EU, exceeding VC investments.

In summary, the distribution of various types of PE investments in the Nordic countries appears similar to both the UK and the EU concerning BO investments. However, the primary distinction in the Nordic region is the higher proportion of VC investments, which can likely be attributed to the strong emphasis on innovation in the Nordic countries. Additionally, the Nordic countries exhibit lower growth, turnaround, and replacement capital activity than the other regions analyzed. As a result, this comparison underscores a subtle distinctiveness of the Nordic PE market, with its significant emphasis on VC investments.

5.6 Summary and research question

The Nordic PE market began its gradual development in the 1990s, slightly lagging behind the more established PE markets in the Anglo-Saxon sphere. However, even in a global perspective, the Nordics have rapidly devolved into a vibrant PE market. As demonstrated in section 5.2, the Nordic countries exhibit significantly more active PE markets than other CMEs, when adjusted for population size. Nonetheless, when accounting for GDP adjustments, they have not yet achieved parity with major PE LMEs, such as the UK. Consequently, the activity in the Nordic PE market can be considered a hybrid between CMEs and LMEs.

A challenge with much of the contemporary literature on PE is that many studies are based on data and research conducted in the US and the UK. Consequently, the differences between LMEs and CMEs hinder the applicability of the findings to the Nordic context. According to Spliid (2013) and the preliminary analysis of the article's main arguments, there are considerable differences in the taxation of carried interest, the prevalence of SOEs, financial development, and access to credit for LBOs. As a result, these disparities render most of the findings and theories derived from academic literature originating in the Anglo-Saxon markets less applicable to the Nordic region. The distinct characteristics of the Nordic countries were also explored in section 4.1, demonstrating the exclusive market conditions in the Nordics, which further limit the transferability of findings and theories drawn from CMEs outside the Nordic region.

Upon examining the individual countries within the Nordics, it becomes evident that Sweden is the largest PE market in the region and is the closest to being comparable to the UK. In terms of deal distribution, there are considerable variations among the Nordic countries. Compared to the EU and the UK, the Nordic region displays a higher VC investment activity, while the UK and EU exhibit a more significant investment volume in growth, replacement, and turnaround capital. Consequently, the categorization of deals in the Nordic countries differs somewhat from those in other CMEs and LMEs.

In conclusion, the preliminary analysis suggests that the Nordic PE market is distinctive, as it occupies a position between the most advanced Anglo-Saxon markets and other European CMEs in terms of activity and market conditions. At the time of writing this article, no research has been conducted on the factors influencing PE investments in the Nordic region. Because of the distinct nature of the Nordic PE market, these determinants are likely to differ from those identified in related literature. As such, this research paper aims to identify the elements that significantly influence PE investment activity in Nordic countries. The research question for the study is as follows:

What are the key determinants of private equity investments in the Nordics?

6. LITERATURE REVIEW: DETERMINANTS OF PRIVATE EQUITY

In order to address the research question posed by this thesis, it is necessary to draw upon existing research on factors influencing PE activity. Literature discussing various factors affecting PE activity is often termed as determinants, a terminology adopted in this research paper. Consequently, this section will review the determinants of PE literature to identify potential drivers and barriers for the Nordic PE market. Given the absence of research conducted on the Nordic market concerning PE determinants, the study must rely on research from other markets, including LMEs, CMEs, and emerging markets. The Nordic particularities will be considered at the end of each subsection to mitigate the potential drawbacks of limited transferability.

6.1 Investment environment

The investment environment has been studied from various angles to identify determinants of deal flow and capital market conditions that facilitate PE activity. Regarding deal flow, Gompers and Lerner (2000) emphasize that the lack of sufficient investment proposals leads to "too much money chasing too few deals" in a study of the American PE market. Under such conditions, the price of the few available deals is bud up as the PE funds compete to secure the investment, thus increasing firm valuations. As a result, returns on the limited number of deals decrease and often lead to periods of poorer PE performance. In an earlier article, Gompers and Lerner (1998) demonstrate that the past performance of VC funds significantly impacts their following fundraising capabilities. Therefore, a limited deal flow compromises PE funds' returns and decreases their fundraising abilities in succeeding periods.

Balboa and Martí (2003) highlight deal flow's importance and widely connect it with macroeconomic and environmental variables such as economic growth, interest rates, labor market rigidities, accounting procedures, and taxes in a study of the European PE market. Spliid (2013) also lists deal flow as one of three conditions for an attractive PE investment environment. Looking at investment behavior, Ljungqvist and Richardson (2003) investigate the investment behavior of private equity fund managers, examining the impact of deal flow on investment outflow. Their findings indicate that an increased supply of PE funds leads to higher competition for deals and leads PE fund managers to decrease investment spending. In such periods, the average fund's performance decreases. Conversely, increased demand for

PE funds (increased deal flow with a constant supply) leads to accelerated investment outflow and higher excess returns.

For venture investments, the exit options are usually that the company is either acquired by a larger firm or listed on a stock exchange through an IPO. Black and Gilson (1999) researched the differences between stock market-centered and bank-centered capital markets concerning VC activity. In the study, the US exemplifies stock market-centered capital markets, while Germany and Japan represent bank-centered capital markets. The authors argue that the presence of a liquid stock market, which enables IPOs, accounts for the more prominent VC activity observed in the United States.

The first explanation for the US dominance in VC provided by Black and Gilson (1999) is the implicit contract over control between the fund and the entrepreneurs obtained through an IPO. The implicit contract implies that the VC fund will exit the firm as it matures. Therefore, the contract enables the entrepreneur to partially regain control of the firm through a managerial position and reacquiring the stake of the VC fund at a later stage, thereby reducing incentives for opportunistic behavior and ensuring the founder's commitment to the startup's success. Consequently, entrepreneurs may demonstrate a preference for VC financing as it potentially offers an opportunity to regain control of the firm in the future. In bank-centered markets (where IPOs are less accessible), duplicating such implicit contracts proves to be challenging.

The second aspect that Black and Gilson (1999) highlight as a cause of the superior American VC activity is that IPOs provide more profitable exit options for VC funds, with an average return of 60 percent compared to 15 percent from acquisitions. These findings are supported by a Venture Economics study that finds IPOs to give a $1.95 excess return on every dollar invested over a 4.2-year holding period; the second-best option for investors was the firm's sale through an acquisition, providing a $0.40 return over 3.7 years (Lerner, 2002). Superior returns in IPO as an exit option are also supported by Amit et al. (1998). Hence, the prevailing literature finds that IPOs constitute a more profitable exit strategy for VC funds.

In the existing literature on determinants of PE, the impact of IPOs is supported by Berlin (1998). The study finds that the supply of venture funds increases with a more active IPO market, indicating the entry of new funds into the market. Jeng and Wells (2000) further researched the determinants of PE activity, creating a macroeconomic model to measure the importance of VC activity. Of all the variables, the strongest driver of VC investments was

the volume of IPOs in the market. Additionally, they established that IPOs significantly impact later-stage venture investments; however, no significant influence was observed on early-stage venture investments.

IPOs can also be sponsored by BO funds, suggesting a relevance outside VC, as much of the literature emphasizes. Schöber (2015) characterizes a BO-backed IPO as an IPO in which the sponsor has acquired a significant equity interest through a BO-type investment. The most common BO investment that ends in a BO-backed IPO is a reverse LBO, where the BO fund reintroduces a company to the stock exchange after taking it off the public market through an LBO in the first place. Levis (2011) finds that PE-backed IPOs typically generate larger capital inflows and yield greater market capitalization compared to VC and non-backed firms. Furthermore, the findings suggest that PE-backed IPOs exhibit better long-term performance (over 36 months). The results are corroborated by Buchner et al. (2019), who find that BO-backed IPOs outperform VC-backed IPOs in the long run.

In contemporary literature, the size and liquidity of the stock market have been recognized as significant factors that influence PE activity. In a survey conducted to assess the attractiveness of Central and Eastern Europe for risk capital, Groh and Von Lichtenstein (2009) identified the size and liquidity of capital markets as one of the six critical drivers. In a subsequent paper, Groh et al. (2010) also found the market size and liquidity to be essential factors in institutional investors' decision-making process for capital allocation into VC and PE.

Schertler (2003) also finds a positive relationship between early-stage VC investments and market liquidity proxied by the number of listed companies. She contends that a liquid stock market offers three benefits to VC firms. First, it establishes an implicit contract, as described by Black and Gilson (1999). Second, it provides a signaling effect for VC funds, demonstrating their ability to successfully finance high-technology enterprises through the stock exchange. Third, a liquid stock market facilitates the development of skills in the population to become successful venture capitalists, thus increasing VC activity.

Another aspect frequently considered within the investment environment for PE is the market capitalization of the public equity market. Schertler (2003) discovers a positive dependency of VC investments on stock market performance in terms of market capitalization. She interprets the findings by asserting that an active stock market presents enhanced exit options for VC funds, thereby facilitating investments. Clarysse et al. (2009) also recognize market

capitalization as an essential driver of VC activity. However, Jeng and Wells (2000) do not observe a significant influence of market capitalization on VC investment or fundraising.

Examining the impact of public equity market capitalization on BO funds, Kelly (2012), employing panel data from 17 European countries, identifies a positive influence of market capitalization on BO investments. However, the same study finds no significant relationship with VC investments. Bernoth and Colavecchio (2014) conduct a comprehensive European PE market analysis examining investment volumes. Their findings reveal a significant positive influence of market capitalization on PE investments. Given that BO funds generally conduct a substantial proportion of total PE investments, these findings may imply a positive association between market capitalization and the investments made by BO funds.

In summary, a robust and abundant deal flow fosters an active PE market by reducing competition among funds, increasing returns, and enhancing fundraising conditions. Additionally, IPOs offer superior returns and an implicit contract over control for VC funds while also being significant for BO funds. Moreover, the size, liquidity, and market capitalization of the public equity market are identified as central factors in facilitating PE activity.

In the context of the Nordic region, the literature review suggests that deal flow may be a limiting factor for the Nordic PE market. This constraint could be attributed to the extensive public control of infrastructure and SOEs, which restricts the number of companies available for acquisitions. Additionally, the Nordic region can likely be considered a bank-centered capital market, thereby limiting the accessibility of IPOs, which might pose a challenge for both VC and BO activity. When examining the financial development of the Nordic region collectively, it is not on par with the leading Anglo-Saxon markets, as demonstrated in Figure 1. Consequently, the Nordic countries may perceive stock market size and liquidity as potential barriers to PE activity.

6.2 Economic conditions

Economic conditions have been identified as influential factors in PE activity. The majority of the existing literature establishes a correlation between PE investment activity and GDP growth (Balboa & Martí, 2003; Bonini & Alkan, 2012; Gompers & Lerner, 1998; Meyer, 2006). Jeng and Wells (2000) stand out as an exception, as they do not identify an association between GDP growth and the volume of PE investments in their global study of VC

determinants. Gompers and Lerner (1998) find that higher GDP growth results in increased VC activity. They argue that a rapidly expanding economy offers entrepreneurs more opportunities and, consequently, a greater number of potential investment targets for VC funds.

Balboa and Martí (2003) report similar findings in their examination of the European PE market, as they observe a significant positive impact of GDP growth and the increase in gross domestic savings on VC fundraising. Meyer (2006) analyzes a panel dataset of 20 European countries and discovers that PE investments are correlated with economic growth. Notably, the rise in the VC investment rate has a more pronounced effect on GDP growth than BO investments. Bonini and Alkan (2012) also determine that GDP positively influences early-stage VC investments, although not the overall VC investment rate.

In the context of economic conditions, the importance of inflation and the impact of interest rates on the private investment environment in an economy has been stressed (S. Khan & M. Khan, 2007; Suhendra & Anwar, 2014). Firstly, Greene and Villanueva (1990) emphasize the consequences of inflation on private investment activity. They assert that elevated inflation rates adversely affect investment activity by increasing the risk associated with long-term projects, reducing the average maturity of loans, and distorting the information conveyed by prices.

Examining determinants of PE literature concerning inflation, Bonini and Alkan (2012) utilize panel data from 16 developed economies and discover that inflation has a considerable negative effect on VC investments. However, they find inflation to be insignificant for early-stage VC investments. Moreover, Füss and Schweizer (2011), in their analysis of macroeconomic and financial variables in the US, do not identify any notable effect of inflation on VC activity. With regard to BO investment activity, Aldatmaz et al. (2020) investigated the determinants of BO investment activity across 61 countries and found that inflation lacks a significant association with BO investment activity.

Considering interest rates, Füss and Schweizer (2011) assert that an increase in long-term interest rates should enhance the appeal of VC, as higher fixed-cost interest payments jeopardize a start-up's success. Conversely, rising interest rates may reduce the attractiveness of potential investments for VC funds as the number of projects with a positive Net Present Value (NPV) declines. They contend that the impact of the first observation will outweigh the second, resulting in a net positive effect on VC investments. Nonetheless, their research does

not establish a direct relationship between VC and long-term interest rates. Interestingly, an increase in short-term interest rates has a negative impact on VC investment activity, suggesting that the supply side exerts a more considerable influence. Consequently, the prospect of a greater number of projects with a negative NPV proves to be more consequential than the heightened demand for VC funding from entrepreneurs.

Bonini and Alkan (2012) identify a negative association between total VC investments and interest rates. Their findings imply that an increase in long-term interest rates leads to a decline in overall VC investment activity while having no significant impact on early-stage investments. These results are consistent with those of Füss and Schweitzer (2011), suggesting that the supply-side effect outweighs the increased demand for VC funding by entrepreneurs. Conversely, Gompers and Lerner (1998) find that VC funding becomes more prominent as short-term interest rates rise. This observation indicates that interest rate increases the demand side of the market (enhancing the appeal of VC financing), consequently resulting in increased VC investment. With regard to interest rates and BO investment activity, Aldatmaz et al. (2020) do not identify any significant association between the two.

In summary, the majority of the literature posits that GDP growth is a crucial factor for PE activity. This effect appears to have a more significant impact on VC investments as it presents increased opportunities for entrepreneurs and elevates the demand for financing. In contrast, inflation seems to adversely affect the private investment environment and has been found to influence VC investment activity negatively. The relationship between interest rates and VC investments remains ambiguous across the various studies reviewed, although the majority suggest a negative association between the two.

As illustrated in Appendices A, I and II, all Nordic countries exhibit high GDP per capita alongside considerable economic growth, signifying favorable conditions for PE activity. In terms of inflation and interest rates, the Nordic region aligns with current European trends, suggesting that these factors should not function as limiting forces for PE activity. Overall, the economic conditions in the Nordic countries appear to foster a favorable environment for PE development.

6.3 Labor market

The labor market regulation is also a factor that has been analyzed as an influencing factor on PE activity. Black and Gilson (1999) argue that strict labor market regulation is a barrier to the success of VC firms, as evidenced by the relatively low activity of VC funds in Japan and Germany. The paper argues that strict labor regulation hampers the ability to hire employees with the intention of letting them go at a later period, thereby reducing the flexibility of newly established companies. Additionally, more rigid labor markets often involve larger benefit payments and compensation, increasing the cost per employee. Both aspects are pertinent for VC funds, as the ability to scale staff based on workflow and the costs of each employee can impact a startup's success. For BO firms, the first aspect is particularly significant as it enables funds to eliminate redundant parts of the workforce following a takeover.

Jeng and Wells (2000) discover that rigid labor regulation has a negative impact on early-stage VC investments, aligning with Black and Gilson's (1999) argumentation. However, Kelly (2012) identifies no significant relationship between labor market rigidities and VC investments. Schertler (2003) observes labor rigidness for regular employment to have a positive influence on VC investments in Western Europe. She speculates that the counterintuitive findings can be attributed to differences in capital demands between rigid and flexible labor markets, as more rigid markets tend to be more developed. Consequently, more rigid labor markets have a higher prevalence of capital-demanding high-technology ventures compared to flexible labor markets. As a result, the investment volume exhibits a positive relationship with labor market rigidities, primarily attributable to the increased capital requirements of these markets.

The impact of labor market regulation on BO investment activity has received less attention in the literature. Kelly (2012) discovers that countries with lower employment protection experience increased BO investment activity. Furthermore, Davis et al. (2019) find a 13 percent reduction in the target company's workforce following a public-to-private BO transaction, suggesting that labor market rigidities may act as a constraint for BO investment activity. Consequently, these findings imply that a more rigid labor market presents challenges for BO funds in enhancing the target firm's efficiency and might restrict investment activity.

Unemployment has been investigated as a factor influencing PE activity, albeit to a lesser extent than labor market regulation. The annual report published by the Global

Entrepreneurship Monitor (GEM) differentiates between necessity-driven and opportunity-driven entrepreneurs (2022). Necessity-driven entrepreneurs operate in market conditions where they are compelled to start a business to supplement their income due to necessity. In contrast, opportunity-driven entrepreneurs establish businesses to capitalize on unmet market needs or technological opportunities. Consequently, increased unemployment may raise the number of necessity-driven entrepreneurs in the market while the number of opportunity-driven entrepreneurs diminishes.

Kelly (2012) discovers a negative correlation between the unemployment rate and overall PE investment activity. The study identifies a weak negative relationship with VC investments but no significant impact on BOs. The study interprets these findings to indicate that higher unemployment rates give rise to a greater number of necessity-driven entrepreneurs. However, this group appears less likely to employ VC financing, thereby reducing the outflow of capital from VC funds. Meyer (2006) reports comparable results, with the unemployment rate demonstrating a significant negative impact on VC investments in Europe while having an insignificant effect on BOs.

In contrast, Wong and Ho (2007) examined the significance of various financing sources for entrepreneurs, encompassing informal investment (friends, family, and followers), debt, and VC in Singapore. Their research indicated that informal investments positively affected opportunity-driven entrepreneurs, while VC financing and debt were found insignificant. Thus, the findings suggest a non-distinct relationship between opportunity-driven entrepreneurship and VC funding. Furthermore, Ndlwana and Botha (2018) do not find unemployment to significantly influence PE investments in the BRICS countries.

Upon comparing studies that report a positive association between VC and opportunity-driven entrepreneurship with those that do not establish any relationship between the two, it is evident that the latter group primarily consists of research conducted in newly developed and emerging markets. Hence, it is possible that unemployment may have a more pronounced impact on developed markets compared to emerging market economies. Therefore, for the purposes of this research, the positive relationship between VC and opportunity-driven entrepreneurship is considered more relevant, given the transferability of these findings to the market conditions in the Nordic region.

In summary, the majority of the literature suggests that labor market rigidity negatively impacts VC activity. However, one study indicated that more rigid labor markets exhibit

higher capital requirements, thus enhancing VC activity. For BOs, the general academic consensus discloses that stricter labor market regulation adversely affects investment activity. Concerning unemployment's effect on opportunity vs. necessity-driven entrepreneurship with VC, the literature showed conflicting findings. Consequently, the decision was made to prioritize the findings from markets most comparable to the Nordic region, where a consistently positive relationship between opportunity-driven entrepreneurship and VC activity was observed. Within the context of BOs, the prevailing academic perspective indicated that unemployment exhibited no significant relationship. It was also noted that unemployment appeared more relevant in developed markets compared to emerging markets.

In order to assess the rigidness of the labor market, the OECD indicators of employment protection for the Nordic countries will be compared with the US, UK, and the OECD average. The full comparison can be found in Appendix C. Utilizing individual and collective dismissal as proxies for labor market rigidities, Norway and Sweden rank above the OECD average, while Denmark and Finland generally rank below. Nevertheless, all the Nordic countries exhibit far more rigid labor market regulations compared to LMEs such as the US and UK. Consequently, it can be suggested that labor market rigidities may present a barrier to PE activity in the Nordic countries, impeding them from reaching an activity level at par with the US and UK. This adverse effect is expected to be more pronounced in Norway and Sweden, which have the most rigid labor markets among the Nordic countries.

The impact of necessity-driven entrepreneurship on the Nordic region remains unclear, given that all of these countries offer generous welfare initiatives for the unemployed. On one side, the income provided to the unemployed may reduce the incentive to start a business as a means to supplement income. On the other hand, the state-provided income could alleviate some financial pressure enabling individuals to pursue novel ideas and establish new businesses. Given that the Nordic countries are regarded as highly developed markets, unemployment is likely to exhibit a negative relationship with BO investment activity, consistent with the findings from the literature review.

6.4 R&D

The following factor frequently addressed in the literature concerning PE determinants is Research & Development (R&D). R&D's inclusion among PE determinants can be attributed to its positive correlation with entrepreneurship, which implicitly enhances VC activity in a market. Therefore, R&D is regarded as a component of cultivating an environment

advantageous to entrepreneurship, thereby supplying high-quality start-ups for VC investment. However, Lee and Peterson (2000) contend that a cultural foundation promoting autonomy, risk-taking, innovation, competition, and proactivity is essential for fostering a favorable entrepreneurial environment. Furthermore, the authors argue that cultural attributes hold paramount importance in entrepreneurship and can only be marginally developed through initiatives such as R&D spending.

Examining the impact of R&D spending on innovation, Hunady and Pisar (2020) discovered a positive correlation between the allocation of resources to R&D and the subsequent increase in innovation. Conversely, Leogrande et al. (2022) revealed a negative association between business expenditure on R&D and opportunity-driven entrepreneurship in Europe. Consequently, the literature presents mixed findings, as R&D appears to promote innovation, while private R&D expenditure seems to be negatively related to opportunity-driven entrepreneurship.

With respect to the influence of R&D on fundraising, Gompers and Lerner (1998) demonstrated that R&D expenditures by industrial firms positively affect the influx of capital to VC funds. Additionally, the authors contend that private sector involvement in R&D contributes more to technological opportunities than public initiatives, which appears to contrast with Leogrande et al.'s (2022) findings. Similarly, Oberli (2014) established that R&D expenditure enhances VC fundraising in both developed and emerging markets. Collectively, the literature indicates a positive relationship between VC fundraising and R&D expenditure.

In the literature concerning determinants of VC investment, R&D is also identified as a significant factor. Bonini and Alkan (2012) discover that R&D spending is the most crucial element in explaining cross-country variations in VC spending. In addition, Romain and Van Pottelsberghe (2004) analyzed panel data from 16 OECD countries and found R&D expenditure to be a positive driver of VC investments. Moreover, Schertler (2003) establishes a positive association between human endowment, as indicated by the number of R&D employees and patents, and VC investments in the economy. Conversely, Kelly (2012) does not find a significant relationship between R&D spending and VC investments. Still, the predominant weight of academic literature suggests a positive relationship between R&D spending and VC investments.

Examining BO investments, Kelly (2012) finds that public tax incentives for R&D activity to stimulate innovation plays a critical role in driving BO investment activity. However, the study does not identify any significant effect of the overall R&D expenditure (standardized by GDP) on BO investment activity, suggesting the absence of any discernible impact from the private sector's R&D expenditure. Oberli (2014) discovers that R&D expenditure significantly negatively affects fundraising for BO funds in both developed and emerging markets, with the magnitude of the effect being far more pronounced in emerging markets in both absolute and relative terms. Consequently, the existing literature offers mixed findings concerning the relationship between R&D investments and BO activity. While tax incentives for R&D expenditure appear to promote BO activity, private sector R&D spending may have diminishing effects on these investments.

In summary, R&D plays a substantial role in fostering the entrepreneurial environment, yet it is not as critical as the cultural foundation that encourages societal attributes conducive to entrepreneurship. The literature review indicates that aggregate R&D expenditure exerts a positive impact on innovation. Conversely, private sector R&D was found to be negatively associated with opportunity-driven entrepreneurship. In relation to the determinants of VC, the prevailing academic perspective concurs that R&D positively influences both fundraising and investment activities. Concerning BOs, the effects are more nuanced, with public tax incentives for R&D demonstrating a positive association with BO investment activities, whereas the aggregate R&D expenditure reveals a negative relationship.

As highlighted in prior sections, the Nordic countries consistently rank among global leaders in innovation, suggesting a robust cultural foundation for entrepreneurship. However, as CMEs, these countries do not entirely embody the attributes identified by Lee and Peterson (2000). Specifically, the core tenets of the Nordic model do not notably foster autonomy, risk-taking, and competition. Consequently, the innovative and entrepreneurial success of the Nordic countries may be ascribed to alternative factors.

A potential explanation for the Nordics' innovative success may be found in their high R&D expenditure. Appendix D illustrates R&D expenditure standardized by GDP for the Nordic countries in comparison with the US, the UK, and the OECD average. Upon examining the R&D expenditure of the Nordic countries relative to the OECD average, it is apparent that these nations allocate substantial resources to R&D. Among the Nordic countries, Norway serves as an exception, falling below the OECD average when R&D expenditure is

standardized by GDP. This discrepancy can likely be ascribed to Norway's considerably higher GDP, resulting from its extensive oil and gas exports.

To further examine R&D efforts without considering GDP, the number of researchers per million was also included in Appendix D. The data reveals that the Nordic countries have more researchers per million than the US and the UK, and significantly exceed the OECD average. The significant commitment to R&D in the Nordic region likely underpins the region's innovative success. However, it raises questions regarding the potential upsides of augmented R&D investment, especially given that current expenditure levels markedly exceed those observed in other developed countries.

6.5 Taxation

Taxation has been examined in the literature concerning determinants of PE. Kelly (2012) remarks that taxation can affect the risk-return ratio by decreasing returns while risks remain constant. First, the corporate tax rate reduces the potential returns of a PE fund due to the decreased cash flow from the target company. Additionally, capital gains tax may potentially influence fundraising activities as taxes imposed on successful investments constrain the fund's returns, consequently diminishing the cash flow available for further investments and reducing LPs returns.

Within the context of LBOs, the corporate tax rate assumes a crucial role, as it engenders a tax shield for the firm post-acquisition. A tax shield arises due to the increased leverage placed on the firm, leading to substantial interest payments that are tax-deductible. According to the Modigliani and Miller (M&M) theorem (1958), a firm's capital structure does not impact its value in a perfect capital market. However, in the revised M&M theorem (1963), the introduction of taxes alters the valuation of leveraged firms, reflecting the effect of the tax shield on reduced tax payments. Drawing upon the M&M theorem, it can be inferred that an elevated corporate tax rate could potentially enhance a firm's valuation post-LBO by expanding the tax shield. This scenario may therefore provide BO funds with additional latitude to acquire firms and strategically adjust their capital structures with leverage to boost valuations.

Refocusing on entrepreneurship, Poterba (1989) contends that reduced capital gains taxation enhances the appeal of becoming an entrepreneur, subsequently increasing the start-up supply in the market. This perspective is supported by Gordon (1998), who finds that personal and

corporate tax rates influence entrepreneurs' decision-making process when considering the initiation of a business. Gentry and Hubbard (2000) also discover that the marginal tax rate negatively impacts entrepreneurial entry. Furthermore, their findings suggest that a progressive tax system also typically exerts a negative impact on entrepreneurship. Finally, Keuschnigg and Nielsen (2004) maintain that taxation is considerably more influential than subsidies for raising entrepreneurial activity. Consequently, the literature suggests that taxation generally has an adverse effect on the entrepreneurial environment and serves as a more potent instrument than subsidies for stimulating innovation.

Examining fundraising, Groh and Von Liechtenstein (2009) identify corporate tax as one of the six key negative factors of risk capital inflow. Aylward (1998) also observes an increase in capital inflow to VC in China during a period when the government introduced tax benefits for venture investments. Gompers and Lerner (1998) ascertain that lower capital gains tax contributes to an increase in funds raised for VC. However, the authors maintain that reducing capital gains taxes may be a "blunt instrument" to expand VC activity in isolation. They argue that the primary effect can be ascribed to the emergence of a greater number of high-quality start-ups. Consequently, the principal impact is identified as the increased entrepreneurial activity and the subsequent demand for VC resulting from the reduction in capital gains tax rather than a direct influence on the VC funds themselves.

In the context of investment activity, Djankov et al. (2010) observe that corporate tax rates exert a negative influence on aggregate investments, entrepreneurial activity, and FDI. When focusing on PE investment activity specifically, Bonini and Alkan (2012) report similar findings, as an increased corporate tax rate diminishes overall VC investment activity. As for BO funds, Kelly (2012) identifies no significant impact of taxation. Aldatmaz et al. (2020) also tested various tax rates in their examination of BO investment activity but found no significant association. Consequently, the literature implies that taxation has a more substantial effect on VC investment activity than on BO investment activity.

To summarize, taxation is expected to negatively impact PE activity as corporate taxes decrease cash flows for investment objects and capital gains taxation decreases returns on successful exits. However, from the perspective of BO funds, corporate taxes may indeed present a beneficial aspect. This is attributable to the possibility that an increased tax shield could augment firm valuation through the reconfiguration of the firm's capital structure. However, no empirical association between corporate taxes and BO investment was found in the literature review. Hence, the lack of observable impact on BO activity likely stems from

the advantageous potential for BO funds to modify the capital structure of target companies. However, this is counterbalanced by the detrimental effects on the funds' returns, culminating in an overall neutral effect.

In synthesizing the literature relevant to VC, a clear negative impact of taxation emerges on entrepreneurial activity, constricting the number of potential investment targets for VC. A similar adverse effect is noticeable in the literature that investigates taxation effects on VC fundraising and investment activity. Thus, the literature thus suggests that taxes exert a more substantial negative effect on VC compared to BOs.

Taxation holds particular significance in the Nordic countries as they generally maintain high tax levels to finance their extensive welfare services. Still, the corporate tax rate varies across the Nordic countries, with Norway having as high as 28 percent in certain years while Finland is at the lower end with 20 percent. Thus, the corporate tax rate is expected to have a negative impact on the supply of entrepreneurs, as well as VC fundraising and investment activity. Nevertheless, the corporate tax rate in the Nordics is not anticipated to adversely affect BO activities, as the literature reveals no significant influence of taxation on these investments.

7. DATA

7.1 Dependent variables outline

The data for the dependent variables employed in this study was obtained by request from Invest Europe and is derived from their annual activity reports. As the premier association of private capital providers, Invest Europe curates an extensive dataset on PE fundraising and investment activity for European countries. Hence, the selected dataset was uniquely suitable for the research question at hand.

In alignment with the research question, the ensuing analysis exclusively utilizes data pertinent to investments. The dataset offered comprehensive data for the Nordic countries for the period 2007-2021. However, the decision was made to exclude the years 2020 and 2021. This exclusion was required due to the unavailability of data beyond 2019 for several explanatory variables, which resulted from the impact of the Coronavirus pandemic on data collection efforts. As a result, the study was limited to the specified period in order to establish a balanced dataset that would improve accuracy, increase statistical power, and minimize bias.

The dataset comprises the nominal investment value for various types of PE in each country invested by domestic funds. This includes the nominal value for all stages of VC, growth, turnaround, replacement, and BO investments. The nominal values were initially provided in thousands of euros but were converted to millions of US dollars to align with other values used in the dataset. Yearly exchange rates obtained from the OECD (2021b) were employed for the 2007-2019 period where necessary.

Certain categories of PE investments were aggregated to streamline the analysis by reducing the number of dependent variables. Firstly, the VC investment variable was consolidated by combining the nominal sum of seed, start-up, and later-stage venture investments. Additionally, the Growth and Turnaround (G&T) investment was established by aggregating the sum of growth and turnaround capital. The reasoning behind merging growth and turnaround capital was that both types of investments function as capital extensions for firms aiming to address their financing requirements. As such, they could be suitably analyzed as a combined variable.

For the BO and total PE investment variables, the data were sourced directly from the provided dataset and converted into millions of USD. Concerning replacement capital, its integration into other variables was deemed unsuitable due to its representation of a PE minority stake purchase from another PE investment organization. Furthermore, the investment activity in replacement capital within the Nordics was also notably low. As a result, replacement capital was omitted from this study to refine the scope of the research.

Dependent variables (in USD, millions)	**Description**	**Source**
Total PE investment	*The nominal aggregate of VC, BO, and G&T investments*	Invest Europe
VC Investments	*The nominal aggregate of seed, start-up, and later-stage venture*	
BO Investments	*The nominal value of buyout investments*	
G&T investments	*The nominal aggregate of growth and turnaround capital*	

Table 4: Overview of the dependent variables.

The dependent variables were also transformed in various ways. The first transformation standardized the investment value by the size of the economy (i.e., GDP). Secondly, the natural logarithm of the level variable was taken to capture any non-linear relationships. The third transformation was computing the natural logarithm of investment volume standardized by GDP. These transformations were performed for total PE, VC, BO, and G&T investments.

Transformation	**Description**
Investment volume/GDP	*Total investment value of PE, VC, BO, and G&T divided by the country's GDP to standardize the value*
ln (investment volume)	*The natural log of the nominal investment value*
ln (investment volume/GDP)	*The natural log of the GDP standardized nominal value*

Table 5: Overview and descriptions of transformations of the dependent variables.

7.2 Independent variables overview

The literature review guided the selection of independent variables that will be introduced in this section. Hence, the selected variables capture the dimensions investigated in the research examined in the prior section, encompassing the investment environment, economic conditions, labor market, R&D, and taxation. A comprehensive overview of the variables is presented in Table 6, including the dimension, variable name, description, and source,

The first three variables selected for this study represent the public equity market as part of the investment environment. The choice of IPOs was based on numerous studies that identified a significant impact of IPOs on PE activity. Considering that the Nordic countries are characterized as bank-centered capital markets, the influence of domestic IPOs on the PE market warrants further examination. This variable denotes the annual number of IPOs completed in each of the stock markets across the Nordic region. The data were sourced from Refinitiv and cross-validated using PwC's annual European IPO Watch.

Secondly, stock market liquidity was chosen based on the findings from the literature review and potential constraints of financial development in the Nordic countries. The data were obtained from the IMF's Financial Development Database and are presented as an index. This index encompasses stock market turnover (stocks traded/market capitalization) for each country, normalized across all data points (countries) within a range of 0-1. A higher value signifies that an economy possesses a more liquid and efficient stock market.

Thirdly, growth in market capitalization captures another dimension of the public equity market within the investment environment. In the literature review, academic consensus indicated a positive relationship between stock market capitalization and VC and BO investments. To investigate whether this held true in the Nordic countries, this data was included as a variable in the analysis. The data was sourced from S&P Global Equity Indices and contained the annual percentage change for stock market capitalization for each Nordic country.

The fourth variable included as part of the investment environment was domestic banks' credit exposure. As with most European countries, the Nordics are considered bank-centered capital markets, which have been found to potentially limit PE activity. Furthermore, banks have been identified as the primary source of leverage financing in LBOs in the Nordic region. Consequently, to assess the impact of banking activity, the variable was incorporated into the study. The chosen data represents banks' credit exposure as a percentage of total GDP

collected from the World Bank. This data is derived from the IMF's International Financial Statistics, combined with World Bank and OECD estimates of GDP.

The fifth variable incorporated as part of the investment environment into the analysis was the ratio of small and medium enterprises (SMEs) to large firms. The literature review emphasized the importance of deal flow for PE funds and suggested that it might be a limiting factor for Nordic PE activity. The Nordic countries exhibit significant variation in the ratio of SMEs to large firms, which will be utilized to examine its impact on PE investments. Data for this variable were obtained from the OECD. As per the OECD definition, SMEs are firms with fewer than 250 employees, while large firms exceed this threshold.

As identified in the literature review, economic conditions play a fundamental role in the analysis of PE determinants. The majority of the literature suggests that GDP growth exerts a positive influence on PE activity within a market. To examine the impact of economic growth on PE activity in the Nordic region, the variable was incorporated into the study. The chosen data for this variable was the annual percentage growth in GDP per capita. The data were obtained from the World Bank, utilizing World Bank and OECD National Accounts records as the foundation for the dataset.

Long-term interest rates were included in the study as a component of the economic conditions. The literature review revealed an ambiguous relationship between interest rates and PE activity. Consequently, long-term interest rates for government bonds with a 10-year maturity were included to further examine the influence of long-term financing costs and the investment climate on Nordic PE activity. The variable was derived from data collected from the Main Economic Indicators in the OECD database.

In order to capture the final factor of economic conditions, inflation was incorporated as a variable in the study. As highlighted in the literature review, inflation influences overall economic conditions and generally exhibits a negative relationship with private investment activity. Therefore, it was included as a variable to determine if these effects are evident in Nordic PE. The selected data for this variable represents the consumer price index, reflecting the annual percentage change in consumer goods and services. The data were sourced from the IMF World Economic Outlook Database.

The labor market was also identified as a potential factor influencing Nordic PE activity in the literature review. One aspect to consider was labor market rigidity, which was found to be a potential barrier to Nordic PE activity. Consequently, the employment protection index from

the OECD was included as a variable to serve as a proxy for labor market rigidities. The index rates countries on a scale from 1 to 6, where higher values represent a more rigid labor market. The database encompasses an index ranking of labor market regulation for both permanent employees and temporary workers.

For this analysis, the emphasis was placed on temporary workers, as the Nordic countries demonstrated considerable variation in regulations pertaining to this aspect of the labor market. To represent the general labor market rigidity for each country, a transformed ratio variable was developed by dividing the rigidity for temporary workers by the overall rigidness of the labor market for permanent employees. This approach facilitates a more accurate assessment of the relative regulatory constraints associated with temporary workers within the broader labor market context. Thus, a higher value signifies more rigorous regulation for employing temporary workers relative to the overall labor market regulation.

The second variable included within the labor market dimension of the analysis was unemployment. Unemployment emerged as a particularly noteworthy factor in the literature review, predominantly in relation to necessity-driven entrepreneurship. The impact of the generous Nordic welfare programs for the unemployed on the number of individuals starting a business due to unemployment remains ambiguous. Furthermore, unemployment has been recognized as a key indicator influencing PE activity in developed countries, a classification that is fitting for the Nordic region given their status as highly developed markets. Hence, to clarify the impact of unemployment on PE activity in the Nordic region, it was incorporated as a variable in the analysis. The variable was created by using the yearly percentage of the population with a registered occupation. This data was obtained from the World Bank, which utilizes the International Labour Organization's database.

R&D emerged as a significant factor in promoting entrepreneurial activity, VC, and BO activity in the literature review. However, the question arose as to how R&D would influence the Nordic PE market, considering their already high levels of expenditure compared to the OECD average. Consequently, the first variable included to capture the R&D dimension of the research encompassed the overall R&D expenditure conducted by public and private enterprises. The variables consisted of each country's gross domestic expenditures on R&D standardized by GDP to analyze the aggregate sum's impact on Nordic PE. The data were obtained from UNESC's Institute of Statistics.

The second variable integrated to investigate a further dimension of the R&D component encompassed indirect public spending on R&D standardized by GDP facilitated through tax incentives. This variable sought to analyze the impact of public initiatives on Nordic PE activity with a specific focus on its influence on entrepreneurial activity and VC investments. The variable was collected in the OECD database representing indirect public spending via tax incentives provided to the private sector to encourage R&D investment.

The final aspect examined in the literature review pertained to the various forms of taxation impacting PE activity. The review revealed that taxation broadly exerted adverse effects on innovation and VC, with no significant influence on BO activity. In this study, the corporate tax rate was selected as the measure of taxation due to the discrepancies among Nordic countries in their taxation of carried interest. This variable was used under the assumption that the corporate tax rate would exert a broadly analogous impact on investment subjects and funds across the Nordic region. The variable represented the combined corporate tax rate expressed as a percentage and was obtained from the Corporate Tax Statistics within the OECD's database.

Dimension	Variable	Description	Notation	Source
Investment environment	IPOs	*The sum of IPOs conducted in all domestic stock markets*	IPO	Refinitiv and PwC IPO watch
	Stock market liquidity	*Index ranking each country from 0-1 based on the stock market turnover ratio*	SM_liq	IMF Financial Development Database
	Δ Stock market capitalization	*Change in public equity markets capitalization included in S&P Global (in %)*	market_cap	S&P Global
	Banks' credit expenditure/GDP	*Domestic credit (loans, non-equity securities, trade credits, and accounts receivable) to the private sector by banks standardized by GDP (in %)*	bank_creidt	World Bank
	SME/Large cap	*The number of SMEs (employees < 250) divided by the number of large caps (employees < 250)*	SME_LC	OECD
Economic conditions	Δ GDP per capita	*The change in GDP per capita (in %)*	GDP	World Bank
	Long-term interest rates	*The average daily interest rates on 10-year bonds measured by year (in %)*	INT	OECD
	Inflation	*The change in the consumer price index, reflecting the annual percentage change for consumer goods and services (in %)*	INF	IMF World Economic Outlook Database
Labor market	Restrictions on temporary employment/labor market rigidness	*The ratio of labor market rigidities standardized by the labor market rigidities for permanent employees*	labor_rig	World Bank
	Unemployment	*The number of people of working age who are without work (that are available for work) divided by the total available workforce*	UE	OECD
R&D	R&D expenditure/GDP	*The total R&D expenditure in the economy (public and private) divided by GDP (in %)*	RD	UNESCO
	Government indirect spending R&D	*Indirect government support through tax incentives standardized by GDP (in %)*	RD_p	OECD
Tax	Corporate tax rate	*The tax on the profits of a corporation (in %)*	tax_c	OECD

Table 6: Summary of independent variables

This table outlines the dimension to which each variable belongs, along with the designated variable name and notation for reference in the subsequent analysis. Additionally, the table provides a short description and the source of the data.

7.3 Correlation

Prior to conducting a comprehensive analysis of the data, Pearson's correlation coefficients were assessed to identify any potential issues related to multicollinearity. These coefficients provide a quantitative value depicting the linear dependence between the explanatory variables. Should the variation between two variables be excessively high, the model may be subject to multicollinearity, thereby leading to inefficient estimates. The full correlation matrix is displayed in Table 7.

A notable correlation exists among numerous explanatory variables. However, only those with a correlation corresponding to a p-value below 1 percent will be addressed, as these correlations pose potential concerns for the ensuing analysis. The first significant correlation observed is between stock market liquidity and banks' credit expenditure. These variables exhibit a negative correlation, suggesting that bank financing activity is associated with reduced stock market turnover. This outcome can plausibly be ascribed to economies characterized by a bank-centered capital market, as presented by Black and Gilson (1999), in which lower stock market liquidity is observed as firms primarily rely on debt for financing.

The second noteworthy positive correlation exists between the ratio of SMEs to large firms and the number of IPOs. This result is not unexpected, as a higher number of SMEs typically indicates a larger pool of potential companies accessible for an IPO. The ratio of SMEs to large firms also exhibits a positive correlation with labor market rigidness regarding the use of temporary contracts. Consequently, it appears that increased flexibility in utilizing temporary contracts positively influences the number of SMEs. This correlation aligns with the findings from the literature review, which emphasizes that flexibility in the labor market is crucial for the success of newly established firms. The significant positive correlation between labor market rigidities and the number of IPOs can be explained using the same reasoning.

A significant positive correlation was observed between the flexibility of the labor market to implement temporary contracts and the unemployment rate. Such a relationship is anticipated, as a more rigid labor market tends to maintain stable unemployment levels, whereas increased flexibility might potentially contribute to higher unemployment. Hence, this positive correlation underscores the potential drawbacks of a more flexible labor market, particularly concerning employment protection.

R&D expenditure also demonstrates significant correlations with both IPOs and the ratio of SMEs to large firms. Surprisingly, the relationship is *negative* for both IPOs and the

prevalence of SMEs. Drawing from the literature review, it was expected that R&D would display a positive relationship, as it could potentially improve the entrepreneurial environment and, accordingly, the prevalence of SMEs relative to large firms. In line with this reasoning, R&D should also demonstrate a positive relationship with IPO activity. Nonetheless, it appears that R&D expenditure maintains a negative relationship with both variables. Total R&D expenditure also shows a strong negative correlation with labor market flexibility concerning temporary contracts. However, a clear explanation for the connection between these two variables remains elusive.

Looking at indirect governmental R&D expenditure, the variable significantly negatively correlates with stock market liquidity and unemployment. The first correlation might indicate that the state's prominent role in the market is a potential limiting factor for stock market development. The negative correlation with unemployment might be explained by the government's reduction in tax incentives in times of worsening economic conditions, of which unemployment might be an indicator. Thus, to shore up state income, there are introduced policy changes to reduce indirect public spending.

Examining the indirect governmental R&D expenditure, the variable displays a significant negative correlation with both stock market liquidity and unemployment. The initial correlation may suggest that a state's prominent role in the market could potentially hinder stock market development, resulting in lower stock market liquidity. The negative correlation with unemployment could be interpreted as a result of the government reducing tax incentives during periods of deteriorating economic conditions, which may be signaled by unemployment. Consequently, policy changes aimed at reducing indirect public spending may be implemented to increase state income.

The corporate tax rate exhibits a positive correlation with long-term interest rates. No evident rationale exists for increased long-term interest rates being influenced by the corporate tax rate, aside from a potentially increased risk premium for countries with higher corporate tax rates. Nonetheless, this correlation could be arbitrary. As for the correlation between corporate tax and unemployment, the coefficient suggests that higher corporate tax rates are negatively related to unemployment. This relationship could be attributed to the revenues generated by higher corporate taxes being allocated to fund programs or initiatives that promote employment and provide workers with training and support.

According to Dormann et al. (2012), the upper threshold coefficients to avoid multicollinearity between explanatory variables should not exceed 0.7. However, Dohoo et al. (1997) propose a higher limit of 0.9 before the model is compromised by multicollinearity. Examining the correlations between the variables in the table, none of the relationships surpass the lower threshold established by Dormann et al. (2012), although some are in close proximity. However, when considering the threshold set forth by Dohoo et al. (1997), the correlations do not pose any concerns. To exercise caution, a supplementary analysis was performed.

Variance Inflation Factors (VIF) were inspected to ensure the validity of the results from the previous assessment of the correlation coefficients. The multitude of literature recommends that no variables should surpass a VIF value of 10 (Hair et al., 1992; Kutner et al., 2004; Kennedy, 1992). In our model, the highest value obtained is 6.65, with a mean value of 4.50 for all the variables. Consequently, the results fall well below the suggested threshold, indicating the absence of multicollinearity in the forthcoming analysis.

Table 7: Correlation matrix displaying the correlation coefficients for the independent variables.

	IPO	SM_liq	SM_cap	bank_credit	SME_LF	GDP	INT	INF	labor_flex	UE	RD	RD_p	tax_c
IPO	1												
SM_liq	0.0521	1											
SM_cap	-0.0484	-0.0676	1										
bank_credit	0.0355	-0.637***	0.112	1									
SME_LF	0.557***	0.220	0.0184	-0.241	1								
GDP	0.367**	-0.0592	-0.157	-0.0333	0.0481	1							
INT	-0.193	0.219	-0.0906	-0.119	0.00993	-0.286*	1						
INF	-0.130	-0.0776	-0.439**	-0.0508	-0.108	0.0228	0.434**	1					
labor_flex	0.504***	0.0719	0.0341	0.171	0.695***	0.0696	-0.156	-0.206	1				
UE	-0.00861	0.363**	0.141	-0.0739	0.0887	0.0449	-0.312*	-0.362**	0.457***	1			
RD	-0.493***	-0.0496	-0.0368	-0.180	-0.673***	-0.169	0.140	0.253	-0.683***	-0.356**	1		
RD_p	-0.0333	-0.471***	-0.00523	-0.0424	0.0560	0.00885	-0.0707	0.247	-0.423**	-0.676***	0.391**	1	
tax_c	-0.157	0.00318	-0.0231	-0.0771	0.127	-0.219	0.687***	0.429**	-0.165	-0.454***	0.139	0.154	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

8. METHODOLOGY

8.1 Model selection

The dataset constructed comprises a time series for a cross-section of the Nordic countries focusing on the determinants of PE. A crucial consideration when analyzing longitudinal data is whether to use a fixed effects (FE) or random effects (RE) model. The literature does not provide a consensus, as Jeng and Wells (2000) apply an RE model, while Kelly (2012) employs an FE model. Moreover, some research, such as Bonini and Alkan (2012), adopt a more primitive pooled OLS approach. Hence, this section will explore the appropriate model choice for this research.

Following Wooldridge (2010), x_{it} denotes the explanatory variable that may vary across t, i, and a combination of alterations across t and i. The term a will be referred to as the individual effect, representing the unobserved individual effect that is constant over time. The term u_{it} is called the idiosyncratic error, which impacts the dependent variable as a result of unobserved factors.

$$y_{it}=\beta x_{it}+a_i+u_{it}$$

The theoretical approach to deciding between RE or FE models suggested by Wooldridge (2010) is to determine if the individual effect, a, should be treated as a random or fixed parameter. Selecting for an RE model may often be deemed advantageous because of its capability to exploit both within and between variation in the data, as opposed to a FE model which primarily utilizes within variation. However, an essential difference between the two models is that the RE model assumes zero correlation between the observed explanatory variables and the unobserved individual effect: cov (x_{it}, a_i) = 0. For our dataset, the unobserved individual country effect seems to have a limited correlation with the explanatory variables included, thereby suggesting the usage of a RE model.

Wooldridge (2010) suggests using the Hausman test to assess whether a_i and x_{it} are correlated. The Hausman test examines the differences between RE and FE models. Since FE models are consistent when a_i and x_{it} are correlated whilst RE models are inconsistent, the Hausman test examines if the difference is systematic and statistically significant. The results of the Hausman test for this study can be found in Appendix E.

Based on the results of the Hausman tests, all models failed to reject the null hypothesis. The significance level was above the critical limit for models employing various dependent variables, providing robust evidence in support of the RE model. Consequently, it was determined that the RE model was the most appropriate choice for analyzing the dataset. In addition, a series of models incorporating time-fixed effects were included to examine whether the predictors remained constant over time.

There were concerns regarding the presence of unit roots for some variables within the dataset. Consequently, unit roots were tested for both dependent and independent variables. Because of the low statistical power when working with relatively small samples, two different tests for unit roots were conducted. The first test used was the Breitung test, followed by the Fisher-Type Augmented Dicky Fuller test. These tests indicated a minor presence of unit roots for two variables. However, based on a review of relevant literature and ensuing discussion, it was determined that these issues would exert only a minimal effect on the study's results. As a precautionary measure, these concerns were included in the study's limitations. A complete assessment of the test outcomes and discussion of the unit root consideration can be found in Appendix F.

8.2 Research approach

The first set of models was constructed employing exclusively the selected explanatory variables for the research. The utilized model specification is displayed below, where *y* represents the dependent variables (nominal, standardized, and in the natural logarithms) for total PE, VC, BO, and G&T investments. The notation *i* signifies each of the Nordic countries, while *t* denotes the observation between 2007-2019. The notation *a* represents the unobserved time-invariant characteristics of the individual country observation. In accordance with the theoretical equation discussed earlier, *u* constitutes the idiosyncratic error that influences the dependent variable and originates from unobserved factors.

The results of the first set of models can be found in Appendix G. Estimating the equation below with four different dependent variables – total PE, VC, BO, and G&T investments – yields our initial set of four models.

$$y_{it} = \beta_0 + \beta_1 IPO_{it} + \beta_2 SM\_liq_{it} + \beta_3 SM\_cap_{it} + \beta_4 bank\_credit_{it} + \beta_5 SME\_LF_{it} + \beta_6 GDP_{it} + \beta_7 INT_{it} + \beta_8 INF_{it} + \beta_9 labor\_flex_{it} + \beta_{10} UE_{it} + \beta_{11} RD_{it} + \beta_{12} RD\_p_{it} + \beta_{13} tax\_c_{it} + a_i + u_{it}$$

A second set of models was developed by incorporating time-fixed effects for the years 2007-2018. The yearly dummy variables proved significant for VC and G&T investments but insignificant for total PE or BO investments. Where time-fixed effects were present, a procedure was implemented to test down the models by eliminating insignificant years and rerunning the models, ultimately retaining only the significant dummy variables. This procedure was accordingly carried out for VC and G&T investments, where the dummy variables were found to be significant, with the intention of further including these variables in the last set of refined models.

The results of the time-fixed effects models can be found in Appendix H. The model specification is displayed below, with the sole addition being the indicator variables representing years.

$$y_{it} = \beta_0 + \beta_1\, IPO_{it} + \beta_2\, SM\_liq_{it} + \beta_3\, SM\_cap_{it} + \beta_4\, bank\_credit_{it} + \beta_5\, SME\_LF_{it} + \beta_6\, GDP_{it} + \beta_7\, INT_{it} + \beta_8\, INF_{it} + \beta_9\, labor\_flex_{it} + \beta_{10}\, UE_{it} + \beta_{11}\, RD_{it} + \beta_{12}\, RD\_p_{it} + \beta_{13}\, tax\_c_{it} + \beta_{14}\, year\_2007 + \beta_{15}\, year\_2008 + \ldots + \beta_{25}\, year\_2018 + a_i + u_{it}$$

In the development of the final set of models, a general-to-specific approach was applied. As explained by Campos et al. (2005), this process involves the simplification of an initial general model to effectively represent the empirical evidence. In practice, the first step involved identifying the dependent variable that yielded the highest goodness of fit, as determined by the overall R-squared value, within the general models. Subsequently, two rounds of elimination were conducted to remove insignificant explanatory variables, retaining only those predictor variables with a p-value less than 5 percent. For VC and G&T investments, significant years derived from time-fixed effects were incorporated as well.

The general-to-specific approach is depicted in Section 9.1, with Tables 8-11 illustrating the final two models, numbered 5 and 6. Model 6 represents the determinants for each investment category and is presented in the equation form below.

$$\ln(TOTINV)_{it} = \beta_0 + \beta_1\, INT_{it} + \beta_2\, labor\_flex_{it} + \beta_3\, UE_{it} + \beta_4\, RD_{it} + \beta_5\, tax\_c_{it} + a_i + u_{it}$$

$$\ln(VCINV)_{it} = \beta_0 + \beta_1\, SMliq_{it} + \beta_2 bank\_credit_{it} + \beta_3\, SMELF_{it} + \beta_4\, INT_{it} + \beta_4\, labor\_flex + \beta_5\, UE_{it} + tax\_c_{it} + \beta_8\, year2007_{it} + \beta_9\, year2008_{it} + a_i + u_{it}$$

$$BOINV_{it} = \beta_0 + \beta_1\, IPO_{it} + \beta_2\, bank\_credit_{it} + \beta_3\, SME\_LF_{it} + \beta_4\, labor\_flex_{it} + \beta_5\, UE_{it} + \beta_6\, RD_{it} + a_i + u_{it}$$

$$GTINV_{it} = \beta_0 + \beta_1\, RD_{it} + \beta_2\, RD\_p_{it} + \beta_3\, tax\_c_{it} + \beta_4\, year\_2010_{it} + a_i + u_{it}$$

9. RESULTS AND DISCUSSION

9.1 Refined models with significant variables

The output presented in Table 8-11 showcases the results of a RE panel regression conducted on all Nordic countries from the years 2007-2019 and is based on a total of 52 observations (13 years x 4 countries). The dependent variables are comprised of the nominal, standardized, and natural logarithm values for total PE investment, VC, BO, and G&T investments. The explanatory variables derived from the literature review are described in detail in Table 6.

Models 1-4 encompass all the explanatory variables along with the years deemed significant in the time-fixed effects models. Model 1 uses the nominal investment volume in USD (millions) as the dependent variable, while Model 2 employs the nominal investment value standardized by each country's GDP. Models 3 and 4 incorporate the natural logarithm (ln) of the first two dependent variables to account for any non-linear relationships between the independent and explanatory variables. Based on the outcomes of these four models utilizing different dependent variables, the most suitable one was selected in accordance with the highest overall R-squared value for the refined models.

The final two models (5 and 6) represent the refined models, incorporating the dependent variable that yielded the best goodness of fit and a selection of significant explanatory variables and dummy variables identified in models 1-4. In Model 6, only variables with a significance level below five percent were retained. As these variables demonstrate the strongest empirical evidence, they are the sole variables regarded as determinants of PE, VC, BO, and G&T investments within this study.

	(1) Total PE Investment	(2) Total PE investment/ GDP	(3) ln(Total PE Investment)	(4) ln(Total PE Investment/ GDP)	(5) ln(Total PE Investment)	(6) ln(Total PE Investment)
IPO	24.2529**	0.0001**	0.0108*	0.0130**	0.0055	
	(2.3219)	(2.4508)	(1.8868)	(2.2030)	(1.1097)	
SM_liq	-9.7e+02	-0.0015	-0.5729	-0.2894		
	(-0.9498)	(-0.6397)	(-1.0228)	(-0.5038)		
SM_cap	-2.5295	-0.0000	-0.0018	-0.0009		
	(-0.7633)	(-0.5479)	(-1.0128)	(-0.4808)		
bank_credit	-14.0895***	-0.0000**	-0.0050*	-0.0047	-0.0004	
	(-2.7582)	(-2.0539)	(-1.7722)	(-1.6406)	(-0.2522)	
SME_LF	-5.5731***	-0.0000***	-0.0019*	-0.0031***		
	(-2.8012)	(-3.2785)	(-1.7446)	(-2.7606)		
GDP	-31.7833	-0.0001	-0.0075	-0.0114		
	(-0.7418)	(-0.5939)	(-0.3180)	(-0.4719)		
INT	-1.8e+02	-0.0003	-0.1268**	-0.0930	-0.1668***	-0.1700***
	(-1.6344)	(-1.1937)	(-2.0653)	(-1.4773)	(-3.1897)	(-3.2887)
INF	56.9537	-0.0000	-0.0424	-0.0281		
	(0.5667)	(-0.0370)	(-0.7686)	(-0.4973)		
labor_flex	954.8022***	0.0015**	0.4893***	0.3580**	0.3685***	0.4014***
	(3.6904)	(2.5443)	(3.4457)	(2.4581)	(3.2884)	(3.7914)
UE	-1.2e+02	-0.0001	-0.1105***	-0.0336	-0.1473***	-0.1588***
	(-1.5337)	(-0.6039)	(-2.6133)	(-0.7745)	(-4.5843)	(-5.5358)
RD	-1.1e+03***	-0.0023***	-0.5097***	-0.4781***	-0.3818**	-0.3945**
	(-3.4890)	(-3.1199)	(-2.8743)	(-2.6284)	(-2.4506)	(-2.5598)
RD_p	5.9e+03	0.0155	3.0688	3.6969		
	(0.9496)	(1.0602)	(0.8931)	(1.0490)		
tax_c	157.0366**	0.0003**	0.0911***	0.0670*	0.0739**	0.0702**
	(2.5113)	(2.0209)	(2.6555)	(1.9033)	(2.4493)	(2.3627)
_cons	5.0e+03**	0.0121**	8.2984***	-4.1542***	7.0549***	7.2183***
	(2.0798)	(2.1578)	(6.3071)	(-3.0782)	(7.1855)	(7.9319)
N	52	52	52	52	52	52
r2_o	0.8149	0.6679	0.8287	0.6515	0.7952	0.7885

z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Final RE models for total PE investments.

The table shows the RE effect models using total PE investment value as the dependent variable. Model 1 presents nominal investment value, Model 2 displays it standardized by GDP, and Models 3 and 4 use their natural logarithms. Model 5 begins eliminating insignificant variables, while Model 6 showcases the most refined model, with all variables significant at below 5 percent.

	(1) VC Investment	(2) VC Investment/ GDP	(3) ln(VC investment)	(4) ln(VC Investment/ GDP)	(5) ln(VC investment)	(6) ln(VC investment)
IPO	-1.4086	-0.0000	-0.0054	-0.0029		
	(-0.6501)	(-0.3840)	(-0.8158)	(-0.4500)		
SM_liq	89.8044	0.0003	0.9285	1.2500**	1.2127***	1.2369***
	(0.4760)	(0.6808)	(1.6118)	(2.2217)	(3.0158)	(3.0707)
SM_cap	-0.0583	0.0000	0.0009	0.0020		
	(-0.0697)	(0.3410)	(0.3713)	(0.8092)		
bank_credit	1.0030	0.0000	0.0071**	0.0077***	0.0087***	0.0082***
	(1.0518)	(1.5302)	(2.4462)	(2.7227)	(3.4446)	(3.2771)
SME_LF	-0.2046	-0.0000	-0.0009	-0.0021	-0.0012	-0.0015**
	(-0.4484)	(-0.8433)	(-0.6748)	(-1.5290)	(-1.4568)	(-1.9905)
GDP	-4.8199	-0.0000	-0.0004	-0.0097		
	(-0.4957)	(-0.2383)	(-0.0120)	(-0.3349)		
INT	-84.5260***	-0.0002***	-0.2920***	-0.2984***	-0.2680***	-0.2612***
	(-2.6454)	(-2.6391)	(-2.9929)	(-3.1322)	(-3.6871)	(-3.5943)
INF	-15.9697	-0.0001	-0.0569	-0.0600		
	(-0.8309)	(-1.3254)	(-0.9698)	(-1.0463)		
labor_flex	56.2924	0.0001	0.3055**	0.1695	0.3946***	0.4430***
	(1.1231)	(0.4422)	(1.9964)	(1.1338)	(3.3332)	(4.0059)
UE	-15.9770	-0.0000	-0.1006**	-0.0061	-0.0668	-0.0868**
	(-0.9743)	(-0.1105)	(-2.0091)	(-0.1243)	(-1.5793)	(-2.2570)
RD	-61.0710	-0.0001	-0.1588	-0.1075		
	(-0.9219)	(-0.3825)	(-0.7849)	(-0.5442)		
RD_p	-3.8e+02	-0.0009	-1.9755	-0.3568		
	(-0.3079)	(-0.2902)	(-0.5285)	(-0.0977)		
tax_c	30.7726**	0.0001**	0.1077***	0.0913**	0.1110***	0.1022***
	(2.5368)	(2.2945)	(2.9091)	(2.5240)	(3.3093)	(3.1239)
year_2007	290.1640**	0.0008**	0.9158**	1.0877***	0.8747***	0.8210***
	(2.4139)	(2.5379)	(2.4953)	(3.0344)	(3.7895)	(3.6241)
year_2008	261.8411**	0.0008***	0.8767***	1.1092***	0.6555***	0.5963***
	(2.3775)	(2.8166)	(2.6070)	(3.3772)	(2.8191)	(2.6247)
year_2010	90.0363	0.0002	0.3096	0.3321		
	(1.1439)	(0.9895)	(1.2885)	(1.4149)		
year_2014	17.5546	-0.0000	0.1313	0.0373		
	(0.2948)	(-0.0038)	(0.7220)	(0.2103)		
year_2018	131.5762*	0.0003*	0.2964	0.2128	0.2124	
	(1.8042)	(1.8375)	(1.3313)	(0.9784)	(1.1241)	
_cons	-2.7e+02	-0.0008	2.7016*	-10.1241***	1.3335	1.8033*
	(-0.5085)	(-0.6108)	(1.6972)	(-6.5122)	(1.1964)	(1.7400)
N	52	52	52	52	52	52
r2_o	0.6610	0.6248	0.7729	0.7461	0.7214	0.7128

z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Final RE models for VC investments

The table shows the RE effect models using VC investment value as the dependent variable. Model 1 presents nominal investment value, Model 2 displays it standardized by GDP, and Models 3 and 4 use their natural logarithms. Model 5 begins eliminating insignificant variables, while Model 6 showcases the most refined model, with all variables significant at below 5 percent.

	(1) BO Investment	(2) BO Investment/ GDP	(3) ln(BO investment)	(4) ln(BO Investment/ GDP)	(5) BO Investment	(6) BO Investment
IPO	21.0660**	0.0001**	0.0107	0.0128	14.5312*	15.8254**
	(2.2139)	(2.3492)	(1.3014)	(1.5640)	(1.7085)	(2.0007)
SM_liq	-9.6e+02	-0.0018	-0.8309	-0.5475		
	(-1.0353)	(-0.8589)	(-1.0341)	(-0.6825)		
SM_cap	-1.6728	-0.0000	-0.0017	-0.0008		
	(-0.5542)	(-0.4082)	(-0.6556)	(-0.2938)		
bank_credit	-12.1580***	-0.0000**	-0.0048	-0.0046	-7.5622**	-13.5666***
	(-2.6126)	(-1.9860)	(-1.1949)	(-1.1345)	(-2.4981)	(-3.3035)
SME_LF	-4.1563**	-0.0000***	-0.0011	-0.0023	-3.3628***	-2.9313**
	(-2.2932)	(-2.5925)	(-0.7228)	(-1.4830)	(-2.5799)	(-2.4224)
GDP	-27.6233	-0.0000	0.0085	0.0046		
	(-0.7077)	(-0.5448)	(0.2512)	(0.1356)		
INT	-1.6e+02	-0.0003	-0.1611*	-0.1274	-2.0e+02**	
	(-1.5302)	(-1.1296)	(-1.8296)	(-1.4487)	(-2.2834)	
INF	89.6413	0.0001	-0.0012	0.0130		
	(0.9791)	(0.4369)	(-0.0157)	(0.1648)		
labor_flex	863.1219***	0.0014**	0.4771**	0.3458*	911.8453***	878.6208***
	(3.6620)	(2.5402)	(2.3420)	(1.7006)	(4.3203)	(4.2751)
UE	-1.1e+02	-0.0002	-0.1559**	-0.0789	-2.0e+02***	-1.7e+02***
	(-1.6334)	(-0.9388)	(-2.5691)	(-1.3034)	(-3.6146)	(-3.1767)
RD	-8.3e+02***	-0.0018***	-0.6560***	-0.6243**	-6.2e+02**	-6.4e+02**
	(-2.8225)	(-2.7044)	(-2.5783)	(-2.4582)	(-2.3332)	(-2.4713)
RD_p	3.2e+03	0.0081	1.2221	1.8501		
	(0.5556)	(0.6267)	(0.2479)	(0.3760)		
tax_c	97.7539*	0.0002	0.0680	0.0439	108.0726**	
	(1.7160)	(1.3342)	(1.3820)	(0.8934)	(2.0270)	
_cons	4.4e+03**	0.0107**	9.0013***	-3.4514*	2.7e+03	6.6e+03***
	(2.0140)	(2.1538)	(4.7688)	(-1.8317)	(1.5871)	(4.0997)
N	52	52	52	52	52	52
r2_o	0.8040	0.6876	0.7912	0.6586	0.7698	0.7744

z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Final RE models for BO investments.

The table shows the RE effect models BO investment value as the dependent variable. Model 1 presents nominal investment value, Model 2 displays it standardized by GDP, and Models 3 and 4 use their natural logarithms. Model 5 begins eliminating insignificant variables, while Model 6 showcases the most refined model, with all variables significant at below 5 percent.

	(1) G&T investments	(2) G&T investments/ GDP	(3) ln(G&T investments)	(4) ln(G&T investments/ GDP)	(5) G&T investment	(6) G&T investment
IPO	-1.2998	-0.0000	-0.0148	-0.0131		
	(-0.6413)	(-0.9368)	(-1.1086)	(-0.9552)		
SM_liq	-1.5e+02	-0.0001	-0.7547	-0.4863		
	(-0.8058)	(-0.2897)	(-0.6252)	(-0.3933)		
SM_cap	-0.5880	-0.0000	-0.0016	-0.0006		
	(-0.9464)	(-0.7045)	(-0.3857)	(-0.1398)		
bank_credit	-1.9233**	-0.0000*	-0.0160***	-0.0160**	-0.7387*	
	(-2.0715)	(-1.7554)	(-2.6235)	(-2.5511)	(-1.6727)	
SME_LF	-0.3179	-0.0000	-0.0009	-0.0021		
	(-0.8876)	(-1.2553)	(-0.3677)	(-0.8870)		
GDP	-3.9647	-0.0000	-0.0423	-0.0458		
	(-0.4984)	(-0.3694)	(-0.8070)	(-0.8529)		
INT	-16.6319	-0.0000	-0.1944	-0.1530		
	(-0.8163)	(-0.7198)	(-1.4478)	(-1.1128)		
INF	-18.7521	-0.0000	-0.1210	-0.1100		
	(-1.0246)	(-0.8386)	(-1.0039)	(-0.8903)		
labor_flex	7.4772	0.0000	0.1348	0.0173		
	(0.1587)	(0.1587)	(0.4341)	(0.0545)		
UE	0.9640	0.0000	-0.1603*	-0.0851	5.9087	
	(0.0652)	(0.4810)	(-1.6449)	(-0.8524)	(0.4966)	
RD	-1.3e+02**	-0.0002*	-0.5877	-0.5559	-71.1890***	-69.4856***
	(-2.1805)	(-1.6880)	(-1.5364)	(-1.4186)	(-2.7743)	(-2.6531)
RD_p	1.7e+03	0.0045	3.2493	3.7858	1.9e+03***	1.9e+03***
	(1.5235)	(1.6274)	(0.4391)	(0.4995)	(3.0983)	(4.0970)
tax_c	30.0033***	0.0001**	0.1345*	0.1128	19.2297***	12.6745**
	(2.5976)	(2.0899)	(1.7677)	(1.4476)	(2.7316)	(2.1342)
year_2010	186.9246***	0.0005***	1.3342***	1.3161***	136.5444**	138.4149**
	(2.8111)	(2.9776)	(3.0454)	(2.9327)	(2.4236)	(2.4111)
year_2016	128.8739**	0.0004***	0.7103*	0.8341**	110.4964**	
	(2.1385)	(2.8037)	(1.7890)	(2.0507)	(1.9614)	
year_2017	124.6531*	0.0004**	0.7485*	0.7875*	86.4158	
	(1.9471)	(2.2198)	(1.7744)	(1.8226)	(1.5195)	
_cons	283.2696	0.0006	7.4762**	-4.9903	-1.1e+02	-1.6153
	(0.6265)	(0.5519)	(2.5096)	(-1.6353)	(-0.4356)	(-0.0105)
N	52	52	52	52	52	52
r2_o	0.5838	0.5309	0.5569	0.4891	0.5036	0.3979

z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Final RE models for G&T investments.

The table shows the RE effect models G&T investment value as the dependent variable. Model 1 presents nominal investment value, Model 2 displays it standardized by GDP, and Models 3 and 4 use their natural logarithms. Model 5 begins eliminating insignificant variables, while Model 6 showcases the most refined model, with all variables significant at below 5 percent.

9.2 Discussion of the determinants of Nordic private equity investments

The ensuing discussion will be centered around the explanatory variables identified as determinants of Nordic PE investments, which are the predictor variables found significant in Model 6. In total, ten variables, excluding the yearly dummy variables for time-fixed effects, were deemed determinants for one or more of the dependent variables. The determinants that were significant for multiple dependent variables will be considered first, as these variables had the most substantial impact on Nordic PE activity. Additionally, the variables from the time-fixed effects models that were significant at a determinant level will also be reviewed.

9.2.1 Labor market flexibility

Labor market rigidities related to temporary contracts were identified as determinants of total PE, VC, and BO investments. The findings suggested that enhanced labor market flexibility regarding the utilization of temporary contracts has a positive impact on all the aforementioned categories of PE investments. The magnitude of this positive effect was most pronounced for BO investments, followed by total PE and VC investments, respectively.

First, we can investigate the effects on BO investment, as the most substantial magnitude effect was observed in this category. The results may be attributable to the flexibility provided to BO funds by employing short-term staff and reducing the number of permanent employees, thereby increasing efficiency and firm valuation. These findings related to labor market rigidities align with other contemporary literature on BO investments. Consequently, the results imply that reducing legal constraints surrounding temporary contracts could serve as a powerful catalyst for raising BO activity in the Nordic region.

Subsequently, it is valuable to examine the positive impact on VC investment. The results imply that Nordic VC investments tend to be more pronounced in regulatory environments where start-ups possess greater flexibility to employ short-term contracts. The probable rationale for these results is that temporary workers enable newly established firms to temporarily increase workflow and hire staff for short-term projects. These findings support Black and Gilson's (1999) assertion that labor market flexibility is a crucial factor in fostering VC investments. Consequently, the Nordic VC market's response to labor market rigidities appears to be in line with findings from other developed markets.

In summary, this study demonstrates that more rigid labor market regulations concerning temporary contracts negatively impact PE in the Nordic region. However, it is essential to note that the variable used in our analysis captures only the dimension of flexibility on temporary contracts and does not consider regulations on permanent workers or worker compensation. The findings related to PE, VC, and BO are consistent with other studies identified in the literature review, suggesting that the Nordic market's response to labor market regulation is similar to that of other CMEs and LMEs.

9.2.2 Unemployment

The result revealed that unemployment served as a determinant for total PE, VC, and BO investments. Upon evaluating the magnitude effects, it was observed that elevated unemployment levels were negatively correlated with all the preceding dependent variables. The adverse effect of unemployment was most pronounced for VC investments, followed by BO and total PE investment activity. The lower impact on total PE investment volume may be attributed to the limited influence of unemployment on G&T investments, which consequently mitigated the effect of VC and BO investments on the overall PE investment volume.

First, the negative impact on VC investment will be discussed, as this dependent variable displayed the most substantial influence of unemployment. To recall, the literature review posed a question concerning how the generous unemployment benefits in Nordic countries would affect necessity-driven entrepreneurship. Considering the magnitude effect of unemployment, there is no evidence to suggest that necessity-driven entrepreneurship becomes more prevalent during periods of high unemployment in the Nordics to stimulate VC activity. Alternatively, if there is an increase in necessity-driven entrepreneurship, it appears that these actors do not pursue VC financing to the same extent as opportunity-driven entrepreneurs. However, given the substantial negative effect observed on VC activity, it seems more plausible that Nordic's substantial unemployment benefits do not contribute to a significant rise in jobless individuals pursuing new ideas and starting businesses, even in the absence of financial pressure.

Turning the attention to BOs, unemployment demonstrated a negative association with these investments as well. The primary rationale for the decline in BO investments is likely rooted in the heightened capital constraints during periods of high unemployment, which often signify declining economic conditions. Consequently, the increased uncertainty elevates the

investment risk, resulting in diminished BO investment activity in the Nordics. These findings align with Kelly's (2012) research on European BO investment activity, suggesting that the response of Nordic BO funds to unemployment is comparable to other CMEs.

A further noteworthy observation highlighted in the literature review is that unemployment seems to serve as a determinant of PE in developed economies, while this relationship is not evident in emerging markets. Consequently, the findings from the Nordic countries reinforce the empirical evidence supporting this observation. Furthermore, given that GDP was found to be insignificant, it could be suggested that unemployment is a more accurate indicator than GDP in representing the underlying economic conditions that influence PE in the Nordic region.

9.2.3 R&D expenditure

The aggregate of public and private R&D expenditure was identified as a determinant of total PE, BO, and G&T investments. This explanatory variable demonstrated a negative effect on these types of PE investments, indicating that higher aggregate R&D investment volume had a consistent negative impact on total PE, BO, and G&T investment. The most substantial negative size effect was observed for BO investments, followed by G&T and total PE investments.

The most unexpected finding regarding this variable is the lack of impact on VC investment. The literature review emphasized that R&D generally had a positive association with the entrepreneurial environment and, by extension, with VC investment and fundraising. However, the results of this study did not confirm such a relationship. The lack of an observable impact of R&D on VC activity will be explored in more detail in the subsequent "Further Discussion" section.

Examining BOs, the negative magnitude effect of R&D expenditure is consistent with Oberli's (2014) findings pertaining to fundraising for BO funds. Consequently, the results for BOs are not unique to the Nordic region. Nevertheless, a clear explanation for *why* R&D expenditure constraints BO investment volume remains elusive. One possible rationale for the findings is that firms with substantial investments in R&D might be perceived as risky targets for BO funds. R&D typically demands a long-term perspective without immediate apparent outcomes, which could result in a reduction in potential target firms for BOs, given that these funds generally require a shorter timeframe for generating returns.

Lastly, R&D expenditure exhibited an adverse effect on G&T investments, albeit at a lower magnitude effect than for BOs. A plausible explanation for this significant effect can be attributed to the benefits of R&D in enhancing a firm's survival rate. Thus, high R&D expenditure can fortify a firm's competitive edge, thereby mitigating the likelihood of insolvency. As a consequence, elevated aggregate R&D expenditure could diminish the volume of companies grappling with financial distress, subsequently restricting investment activity for PE turnaround capital.

9.2.4 Corporate tax rate

Corporate tax was classified as a determinant of PE, VC, and G&T investments in this study. The results indicate that the variable acts as a driving factor for these categories of PE activity, suggesting that a higher corporate tax rate positively influences investments. With respect to the size effect, it was found to be most prominent for VC investments, followed by G&T and PE investments, which exhibited approximately similar magnitude effects.

Given the largest size effect was observed for VC investments, the discussion will begin with that category. Recalling the literature review, taxes were found to have adverse effects on the entrepreneurial environment and overall PE activity. Dissecting the impact of corporate taxes from the firm perspective, a higher corporate tax rate should decrease the cash flow of new firms, reducing their likelihood of success. However, since it often takes years before these firms become profitable, the corporate tax rate might exert limited effects. Still, there is no evident explanation for the observed positive relationship between higher corporate tax rates and VC investments.

Considering the absence of a reasoned explanation for the positive association between corporate taxes and VC investment, it is plausible that the relationship may be coincidental. However, the crucial insight to derive from these findings is the apparent lack of influence of the corporate tax rate on VC activity. Consequently, the results challenge the notion that corporate taxes are detrimental to VC activity or, by extension, the entrepreneurial environment.

Next, we can explore the positive influence of corporate taxes on G&T investments. A plausible explanation for these findings may be derived from re-examining the effects of corporate taxes on firm liquidity, where higher taxes lead to reduced cash flow. In the context of growth capital, reduced liquidity might prompt Nordic firms to seek external financing partners to address their financing needs, which could increase the investment volume for

growth capital. As for turnaround capital, diminished cash flow might heighten the likelihood of financial distress, thereby increasing the deal flow for turnaround investments. Consequently, the positive effect of corporate taxes on G&T investment seems more reasonable, as reduced cash holdings necessitate firms to pursue PE financing for growth capital and increase the probability of financial distress, ultimately enhancing investment activity.

9.2.5 Banks' credit exposure

Banks' credit expenditure standardized by GDP was identified as a determinant of VC and BO investments. However, the effect size differed for these two dependent variables, with this regressor acting as a driver for VC investments while exerting adverse effects on BOs. This variable constitutes the only instance in the study where an explanatory variable's magnitude effect influences two categories of PE investments in opposing directions. Assessing the effect size in absolute values, the positive impact on VC investments marginally surpasses the negative effect on BOs.

First, the positive association between banking activity and VC investments will be examined. Based on the findings of the literature review, it was expected that a more bank-centered capital market, characterized by a higher credit exposure from the banking sector, would exert a negative influence on VC activity. In contrast, the results of this analysis indicate that banking activity complements VC investments in the Nordic region. A plausible explanation could be the risk distribution between VC funds and banks. If start-ups have greater access to debt financing, it may decrease the amount of capital required from VC funds. Consequently, Nordic VC funds might have more capital available for distribution, which can be allocated to a larger number of start-ups, enabling the funds to further diversify their investments. As a result, the increased diversification benefits derived from higher access to debt financing reduce the risk of each investment, thereby elevating the total investment volume.

When examining the results relating to BOs, the findings appear less intuitive compared to VC investments. As illustrated in Figure 2, the deal sizes in the Nordics are generally too small for BO funds to utilize bonds as leverage. Consequently, these funds must rely on banks as their primary source of leverage in LBOs. One would expect that higher credit availability should lead to an increase in LBO deals for BO funds. However, the results indicate that higher credit availability has a negative impact on BO investments in the Nordic region.

A potential explanation for these counter-intuitive results in the Nordics may be rooted in the regulatory requirements for LBOs. In situations where the economy already exhibits high leverage at the firm level, the regulatory requirements for alternative debt financing with elevated risk (such as LBOs) may be tightened to restrict the access and utilization of debt in risky investments. Consequently, even though banks serve as the primary sources of leverage for Nordic PE funds, increased credit in the overall economy might inadvertently lead to negative impacts on BO investments. Nonetheless, this interpretation might be somewhat notional, so it is advised to approach it with caution.

9.2.6 The ratio of SMEs to large firms

The proportion of SMEs to large firms was identified as a determinant of VC and BO investments. This variable exhibited adverse effects on both categories of PE investments, suggesting that a higher prevalence of SMEs relative to large firms negatively influences both VC and BO activities. With respect to the magnitude of the adverse effects, it was somewhat more pronounced for VC investments than for BOs.

First, we can investigate the variable's adverse effect on VC investment activity. The research findings were surprising as, from a purely intuitive perspective, one could argue that a higher number of SMEs would imply a more favorable entrepreneurial environment and an increased number of potential investment targets for VC funds, thereby enhancing deal flow. The literature review also revealed that fund managers typically increase investment spending in response to such environments. However, the results for the Nordics demonstrate the opposite effect.

A possible explanation for these results could be that, in the Nordics, large firms primarily provide VC investments with more exit options through acquisition. Coupled with the findings on IPO activity, which showed no significant relationship with VC investments, the results may suggest that acquisitions (by large firms) constitute the most prevalent exit option for VC-financed companies. This notion is consistent with the latest exit trends in the Nordics, where acquisitions accounted for the majority of exits (Hodgson, 2022). As a result, Nordic VC investments appear to be predominantly driven by potential exit opportunities rather than the deal flow of startups themselves.

In the case of BOs in the Nordic region, the prevalence of SMEs relative to large firms has a negative effect on investment activity. These findings are consistent with expectations, given that BO funds primarily target mature firms. One might question these results in light of

Figure 3, which indicated that the majority of Nordic BO are categorized as small. However, transactions categorized as “small” by Invest Europe include deals up to 15 million euros which, when analyzing the upper threshold, likely involve firms with more than 250 employees. Overall, the results suggest that the preponderance of large firms in the economy serves as a driver for Nordic BO investments.

9.2.7 Long-term interest rates

Long-term interest rates on bonds with a 10-year maturity were identified as determinants of total PE and VC investments. The variable exhibited negative effects on both dependent variables, indicating that higher interest rates adversely influence total PE and VC investments. The magnitude effect was most pronounced for VC investments, suggesting that the impact on total PE investment stems from the influence of interest rates on VC. Therefore, the discussion will be centered around VC investments.

The literature revealed conflicting evidence of interest rates on VC activity, which were distilled into two counteracting effects. When interest rates rise, the first effect entails a reduced NPV for potential investments from the perspective of VC funds. In opposition, the second effect highlights the increased attractiveness of VC funding from the standpoint of newly established firms. Studies have identified evidence of both effects; however, the majority of research indicated that the first effect is dominant.

This examination of the negative impact of long-term interest rates on VC investments in the Nordics suggests that the first effect is more prevalent. As a result, the increase in interest rates affects the discount rate and subsequently the NPV from the funds, which proves to be the most dominant effect compared to the increased demand for VC financing from founders. Therefore, this study further strengthens the empirical evidence that the first effect is the most prominent in relation to interest rates.

9.2.8 IPOs

The analysis revealed the annual number of IPOs as a determinant of BO investment. The variable demonstrated a positive effect, indicating that increased IPO activity promotes BO investment. However, based on the findings from the literature review, IPOs were anticipated to be a crucial factor for VC investments given the superior returns and the implicit contract of control between VC funds and entrepreneurs. Nevertheless, the connection between VC investment and IPOs was only captured indirectly through stock market liquidity. Contrary to

the results from CMEs and LMEs, the findings suggest that within the Nordic context, IPO bear a more substantial impact on BOs compared to VC investments.

Interpreting the results for BO investments, the positive effect can likely be captured by examining the influence of IPOs on deal flow. The first impact on deal flow is presumably the considerable role played by reverse LBOs in the Nordic market. The second aspect, as identified in Section 5.3, suggests that the presence of SOEs and public ownership over infrastructure was believed to constrain Nordic PE activity, as it limited the potential companies accessible for acquisition. Subsequently, IPOs can be interpreted as an estimate for the augmented quantity of firms listed on the stock exchange. This essentially functions as an indicative proxy for the volume of potential target entities available for acquisition in public-to-private transactions. As such, the observed positive impact of IPOs is likely partially attributable to the significance of reverse LBOs and BO-backed IPOs in the Nordic region, alongside their role as a metric for the volume of viable target firms for BOs.

9.2.9 Stock market liquidity

Stock market liquidity was identified solely as a determinant of VC investments. The variable demonstrated a positive effect, suggesting that increased stock market liquidity raises VC activity. A key distinction between the Nordics and more developed LMEs, such as the US and the UK, is the development of the financial markets. Consequently, these findings underscore the significance of an active stock market for VC investments.

Schertler (2003) outlined three primary benefits that a liquid stock market bestows VC investments. First, there is the implicit contract conceived by Black and Gilson (1999). Second, the signaling effect for VC funds is enhanced as a liquid stock market offers the opportunity for successful exits through IPOs. Third, the development of skills necessary to become a proficient venture capitalist is fostered within the population. Consequently, the discussion will focus on establishing which of these aspects is likely to be the dominant factor contributing to the positive influence of stock market liquidity on VC investment in the Nordics.

The first aspect to examine is the implicit contract, which serves as the first indication in this study of any association between VC and exits in the Nordic public equity market. In this context, it is reasonable to interpret the variable as a proxy for IPO activity. However, considering that the IPO variable demonstrated no significant influence on VC investment, the effect of the implicit contract on VC should not be overstated. Nevertheless, the results

suggest that the liquidity of the Nordic public equity markets contributes to differences in VC investments, thereby establishing at least some relevance of the stock market as an exit venue for Nordic VC investments.

The signaling effect of a liquid stock market for VC funds is likely a considerable driver of Nordic VC activity. The signal to entrepreneurs is that the liquid stock market facilitates greater access to capital for their companies. Furthermore, decreased transaction costs and improved access to buyers facilitate the process when founders aim to sell down their stakes in successful startups that ultimately become listed on the stock exchange. As a result, the existence of a liquid stock market stimulates Nordic entrepreneurs to pursue VC financing, which helps clarify the positive association between investment values and stock market turnover.

The development of skills appears to be less relevant in the Nordic context because of the extensive cross-border investment activity and labor migration, both among the Nordic countries and across the EU. Therefore, if an unexploited market potential exists in one of the Nordic countries due to knowledge gaps related to VC within the population, it is probable that this gap would be addressed by the influx of expertise from other Nordic countries and the EU. As a result, the skill development advantages provided by a liquid stock market seem to be less applicable to the Nordic region.

In conclusion, among the three advantages of a liquid stock market outlined by Schertler (2003), the signaling effect for VC funds directed toward entrepreneurs appears to be the most dominant factor explaining the positive relationship between VC investments and stock market turnover. In addition, the findings may also suggest, indirectly, the importance of IPOs as an exit option. Nonetheless, the development of expertise within the population necessary to become a successful venture capitalist appears to be of lesser relevance in the Nordic context.

9.2.10 Tax-incentivized R&D expenditure

Indirect public spending through tax incentives for R&D was found to be a determinant and driver exclusively for G&T investments. Curiously, the variable exhibited an *opposite* effect compared to the overall R&D expenditure on G&T investments. Consequently, it appears that indirect public spending exerts a positive impact on G&T investments, while the aggregate sum of R&D expenditure results in a reduction.

Admittedly, there are no clear reasons as to why indirect public R&D investments should have a positive effect exclusively on G&T investments. A possible explanation for these results could be related to the insufficient state of R&D and innovation in Nordic economies that have implemented tax incentives. The necessity for tax incentives to R&D and innovation might be an indication of a less effective and innovative market that requires state intervention to alleviate the issue. In such markets, it is plausible that a larger number of companies might face financial distress, thereby increasing the demand for turnaround capital from PE funds. Additionally, these companies might experience lower profitability, driving the need for third-party financing through growth capital. However, this explanation may be somewhat speculative and should be interpreted with caution.

9.2.11 Time-fixed effects

Time-fixed effects were observed in only two of the dependent variables employed in this study, namely VC and G&T investments. For VC investments, the years 2007 and 2008 were found to be significant determinants. This finding was not particularly surprising, considering that the global financial crisis transpired during that time period. Interestingly, the coefficients indicate that VC investments were notably *higher* in these years (than in the base year of 2019), which merits further discussion.

A plausible explanation for these results might be related to the Nordic VC funds' response to the anticipated decrease in the survival rate of portfolio firms during that period. Consequently, the funds may have increased capital inflow into existing investments to provide a lifeline for existing investments to weather the storm. Hence, the results highlight the distinctive strategic response of Nordic VC funds to shocks, which involves reinforcing current projects rather than conserving capital for more favorable conditions.

For G&T investments, the year 2010 is found to be significant at the determinant level. The coefficient suggests that investment levels were particularly high in 2010, prompting the question of why this specific year holds significance. Upon scrutinizing the trajectories of economic growth across the Nordic countries, as outlined in Appendix A, it is apparent that each nation underwent a noteworthy phase of expansion subsequent to the financial crisis, with the inception of this surge traceable to the year 2010. In light of the propensity for risk aversion exhibited by banking institutions in the wake of the credit crunch, it is plausible to reckon that more stern regulations pertaining to the extension of credit and disbursement of loans were put into effect. Consequently, firms likely experienced an increased need for

growth capital to fulfill their financing requirements during the growth period, turning to PE funds for support. Furthermore, it is plausible that many firms weathered the financial crisis using cash reserves but required turnaround capital from PE funds in the aftermath of the crisis.

9.3 Further discussion

In the ensuing segment, we will study the factors that were initially assumed to exert influence on the assorted categories of PE investments. Despite the expectations, the analysis failed to establish any such relationships, thereby necessitating a more detailed discussion. The emphasis will be on a broad analysis at the dimension level, signifying that multiple variables will be considered simultaneously. Additionally, the discussion will encompass an examination of the absence of time-fixed effects on BO investments, exploring its potential implications.

9.3.1 Economic conditions and Nordic PE

In this study, GDP per capita growth, interest rates, and inflation were incorporated to represent economic conditions. As previously discussed, interest rates emerged as the sole determinant of Nordic PE. However, GDP per capita growth and inflation proved to be insignificant across all general and, consequently, not deemed a determinant of any of the dependent variables.

The insignificance of GDP growth in this study was a surprising outcome as it contradicts the prevailing literature on PE determinants. Inflation exhibited similar results, although this was more anticipated, given the literature review highlighted its lesser relevance in developed markets. One possible interpretation for the insignificance of economic conditions may be attributed to domestic PE funds' confidence in the Nordic region's economic performance. Relative to other European markets, Nordic countries typically exhibit more robust and prosperous economies. Consequently, the consistent resilience of the Nordic model may have fostered heightened confidence among PE funds regarding sustained economic growth.

The findings suggest that the high confidence in the state's governing of economic conditions might lead PE funds to disregard these factors to a greater extent than in most other comparable developed markets. The observed behavior of VC funds during shocks further supports this theory, as the response to shocks involved doubling down on current investments, indicating a strong belief in the state's ability to navigate the upheaval and the

resilience of the economy. Consequently, it is probable that the high confidence in the governing system and the Nordic model renders economic conditions, such as GDP and inflation, less relevant as indicators for Nordic PE investments.

9.3.2 R&D's missing impact on Nordic VC

The literature review underscored the significance of R&D as a key stimulant for entrepreneurial ventures and VC activity. Therefore, the outcomes of the present analysis, wherein both variables encapsulating separate dimensions of R&D expenditure demonstrated no significance for VC investments, were somewhat unexpected. This discovery points to a unique and non-significant association that deviates from the observed patterns in other developed markets, thereby warranting an in-depth discussion.

The literature review raised concern about the potential impact of additional R&D expenditure within the Nordic region, given its existing high investment levels relative to other developed economies. As such, a potential statistical reason for the lack of significant influence on VC investments could be ascribed to the uniformly high R&D expenditure across all Nordic countries. This uniformity might impede the models from observing a direct association.

A more hypothetical suggestion to account for the insignificant relationship may involve examining in-house business innovation. The insignificance of the aggregate sum of R&D on VC investment activity could potentially be attributed to the fact that much of the private expenditure is allocated to in-house business innovation in the Nordics. Consequently, the substantial R&D investments pose direct competition to independent start-ups and may diminish larger firms' requirements for external sources of technology and innovation, subsequently reducing the exit opportunities for entrepreneurs and Nordic VC funds.

Another noteworthy observation stemming from the non-significant influence of indirect tax incentivized R&D expenditure relates to the limited impact such public measures have on innovation and VC investment activity. The variable failed to demonstrate a significant association even within the general models, thereby further underscoring the non-existence of any consequential impact. Consequently, it appears that promoting VC investments and entrepreneurial activity within the Nordic region should rely on alternative avenues than further increasing R&D investments through tax incentives.

9.3.3 Time-fixed effect and BO investments

In applying time-fixed effects to the models, only G&T and VC investments exhibited time-fixed effects, while no such effects were observed for total PE and BO activity. The lack of time-fixed effects for total PE investments likely stems from the absence of such effects on BOs, considering that BOs constitute the most substantial portion of the total investment value. Still, the disparity in the presence of time-fixed effects across various types of PE categories warrants further discussion.

The absence of time-fixed effects was unexpected, particularly since significant shocks, such as the 2008-2009 financial crisis, appeared to have no adverse impact on the total investment value of BOs. Hence, these findings reinforce the notion that Nordic BO investments demonstrate even greater resilience in comparison to other categories of PE, particularly when confronted with unfavorable macroeconomic circumstances and volatility in the public equity market. This perspective is bolstered by the observed non-significance of both macroeconomic and investment-related variables, which serve as indicators of the overarching investment climate. These include factors such as stock market liquidity, stock market capitalization, GDP, interest rates, and inflation. In conclusion, BO investment activity in the Nordic region seems to exhibit an enhanced resilience to fluctuations in the investment environment.

9.4 Research limitations

The first limitation of this study was the lack of contemporary research on the Nordic PE market, particularly regarding the determinants of Nordic PE activity. As a result, it was necessary to draw on research conducted in other markets with different regulations and market conditions, which may not fully capture the unique characteristics of the Nordics. Despite efforts to capture the Nordic particularities through the application of relevant literature, the explanatory variables used in the research may have been insufficient to catch the nuances of the Nordic context. These limitations might have led to a reduction in the explanatory power of the study's findings.

The second limitation of this study pertains to the exclusive utilization of panel data from the years 2007 to 2019. This decision was necessitated by the unavailability of data beyond 2019 for many of the explanatory variables stemming from the impact of the Coronavirus pandemic on data-gathering efforts by the OECD. As a result, the study was limited to the

aforementioned period to attain a balanced dataset that would enhance accuracy, representation, statistical power, and reduce bias. However, this approach may have restricted the generalizability of the study's findings, as it precludes the capture of any trends or changes that may have occurred beyond 2019.

The third limitation was the presence of unit roots for a small number of variables. The variables were tested for unit roots using the Breitung test and the Fisher-Type Augmented Dicky Fuller test. Given the relatively small sample size of the dataset and the low explanatory power of unit root tests in these circumstances, it was noted that two of the variables appeared non-stationary. The appearance of non-stationarity was expected based on the relevant literature and subsequent discussion found in Appendix F. Therefore, it was decided to proceed with the analysis as the unit roots are unlikely to significantly influence the results. However, it is still important to note the mere presence as a potential limitation of the analysis and to exercise caution when interpreting the results.

While the current study is aimed to provide a comprehensive understanding of the Nordic PE market and its determinants, it might limit the study's specific focus on each category of PE investments. Each type of PE investment has its own set of characteristics, such as the investment horizon, expected rate of return, and risk profiles. By collectively assessing the determinants of all categories of PE investments, the study risks marginalizing or neglecting the distinctive attributes associated with each specific type. In conclusion, while analyzing all categories of PE investments offers a broad perspective on the subject, it is essential to acknowledge the limitations of this approach.

As part of the methodology employed in this study, the sum of growth and turnaround capital and all stages of venture investments were aggregated into single variables. This decision was made in an effort to streamline the analysis and simplify the study by reducing the number of variables involved. However, it is essential to acknowledge that this simplification may have resulted in the loss of nuanced information that could have been captured by treating the PE investment categories separately. This approach might have been most disadvantageous for VC investments, where the determinants are likely to have distinct impacts on early and late-stage venture investment. Consequently, the interpretation of the analytical outcomes should be conducted cautiously, bearing in mind the limitations induced by this simplification.

9.5 Suggestions for future research

The first proposal for further research is based on the relationship between banking and VC investment activity. In the literature review, the general academic consensus implied that bank-centered capital markets deterred VC activity. However, the findings of this research demonstrated a positive association between elevated banking activity and VC investment activity in the Nordic countries. Therefore, the findings suggest a symbiosis between Nordic banking activity and VC. Hence, a suggestion for further research would be to verify the positive relationship between Nordic banking and VC. Additionally, the study could investigate the underlying mechanisms facilitating the advantageous interaction between the two entities.

In this study, labor market rigidity was explored regarding the regulation of the usage of temporary contracts. Given the extensive scope of the study, incorporating an additional factor relating to labor market rigidity was considered unfeasible. Therefore, the compensation aspect of labor regulation was left unexplored. However, the Nordic model emphasizes egalitarianism, giving the region a rigid and high wage level compared to other developed countries. Therefore, a potential research area appropriate for further research would be to analyze how the wage levels in the Nordic influence PE activity.

As a follow-up on the research limitation of this study, the third suggestion for further research would be to focus on the determinants of Nordic VC, separating between the various investment stages, such as early- and late-stage ventures. As indicated in the study's limitations, it is conceivable that the determinants influencing the diverse stages of VC investment may differ. Hence, it would be valuable to further identify the determinants underpinning each stage of VC investment in the Nordics.

The fourth recommendation for future research entails a more comprehensive exploration of the determinants influencing G&T capital. The literature review conducted for this study did not reveal any direct empirical research on the determinants of G&T investments. This observation highlights a noteworthy gap in the current academic research, which warrants further exploration. Consequently, a viable course of action for future research would be to leverage the findings of this study to identify global determinants for G&T capital.

The fifth and final proposal for further research concerns PE funds' strategic response to shocks. This study found that Nordic VC funds responded to the financial crisis by increasing the total yearly investment spending. The interpretation of the findings concluded that Nordic

VC funds reacted to the shock by increasing their investments in existing portfolios to guarantee sufficient capital infusion for startups to withstand the tumultuous conditions. The Nordic behavior may be attributed to various factors, including investment strategy, sunk cost fallacy, pro-social motivation, or a combination of these elements. Consequently, one area that merits further examination is the potential discrepancy in the response of PE funds based in different countries to economic shocks such as a financial crisis. Hence, a promising direction for future research might involve a comparative analysis of regional differences and the examination of the underlying factors influencing the divergency in VC funds' reactions to economic disruptions.

10. POLICY IMPLICATIONS

In this section, the implications of the research findings will be discussed in a policy context with a focus on the investment environment, economic conditions, labor market, R&D, and taxation. Emphasis will be placed on the determinants, as the empirical evidence supporting the effects of these variables is most robust. It is important to note that this section is intended to serve as a guide for utilizing the findings of this study rather than a comprehensive list of implementable recommendations. Consequently, the primary aim of the section is to apply the findings within a policy context to facilitate the enhancement of PE investment activity while acknowledging that the policy implications may not address potential externalities beyond the scope of this research.

10.1 Enhancing the Nordic investment environment

The variables representing the investment environment dimension were found to be determinants of VC and BO investment activity. These variables had diverse effects, with IPOs and stock market liquidity deemed as drivers, while bank credit exposure displayed opposing size effects on VC and BO investments, and the prevalence of SMEs compared to large firms had adverse effects on both categories. Consequently, the implications of these findings will concentrate on promoting the drivers while mitigating the adverse effects of the non-facilitators. In light of the opposing size effects of banking activity on the VC and BO categories, no explicit policy changes are proposed, as it may potentially undermine the activity of one of the PE categories.

10.1.1 Improving stock market liquidity and IPO activity

Drawing upon the terminology introduced in the literature review, it appears that the Nordic countries could benefit from transitioning towards a more stock-centered capital market, considering the positive impact of IPOs and stock market liquidity on VC and BO investments. However, effectuating such a shift proves to be a complex endeavor, as banks typically serve as the cornerstone of capital markets in most CMEs.

Black and Gilson (1999) suggest that bank-centered capital markets avoid creating new institutions in their domestic capital markets by "piggybacking" on stock-centered capital market institutions. One example from their study highlights Israeli firms successfully "piggybacking" on American stock exchanges, such as Nasdaq, to list successful startups.

Consequently, Nordic VC funds could leverage other countries' public equity markets to take successful Nordic startups to a foreign stock exchange, benefiting from the deeper markets found predominantly in LMEs like the US and the UK, as well as considerable stock exchanges in other European CMEs.

An issue with relying exclusively on the "piggybacking" approach is that it primarily emphasizes the enhancement of VC activity. There are undeniable advantages to fostering the Nordic capital market for BO investment activity, as the deal size is more suitable for domestic funds than operating in foreign markets. Consequently, efforts should be directed towards further increased activity in the domestic public equity market and promoting IPO activity.

Encouraging participation, improving accessibility, and attracting foreign investors are likely to have a positive impact on domestic stock market turnover. In terms of IPOs, policy changes aimed at reducing friction for firms seeking to list on the stock exchange may be required. A feasible approach to boost IPO activity could involve streamlining the process by cutting bureaucratic red tape, easing reporting obligations, and relaxing firm requirements for IPOs. Additionally, prioritizing the development of a liquid stock market is likely to inherently stimulate IPO activity as more firms seek to reap the benefits associated with deeper Nordic stock markets. However, given the intricacies associated with executing meaningful transformations in domestic public equity markets, these suggestions merely represent a starting point.

10.1.2 Increasing the supply of large firms through privatization

In the analysis, it was established that the proportion of SMEs in relation to large firms had adverse effects on BO and VC investments. Consequently, the Nordic PE markets could potentially benefit from an increase in the number of large firms within the economy for PE purposes. This notion aligns with the literature referenced in Section 5.3, which suggests that SOEs and government control over public services and infrastructure, such as railways, water supply, power, and postal services, could negatively impact BO and VC activity in the Nordic region. In summary, it appears that the Nordic countries might benefit from a more extensive corporate sector consisting of larger firms.

One recommendation for increasing the number of large firms involves expanding the private market in the Nordic region. An initial approach could involve privatizing some infrastructure services to foster a more vibrant private market. Additionally, privatization could be

considered for SOEs in the Nordic countries, which currently are unavailable for takeovers. Ultimately, these alterations could potentially boost PE activity by expanding the number of firms accessible for acquisition by BO funds and possibly enhance exit opportunities for VC funds.

10.2 Interest rates and monetary policy

In the analysis of economic conditions, only long-term interest rates were found to be determinants of total PE and VC investments. The interest rates demonstrated adverse effects on both dependent variables, suggesting that higher long-term interest rates negatively influence PE and VC activity in the Nordics. However, proposing policy changes to reduce long-term interest rates is a complex undertaking, as numerous factors beyond the scope of this paper influence the bond market. Nonetheless, considering the intention to derive policy implications from the findings, this discussion will concentrate on the association between long-term interest rates on bonds and policy rates set by the various Nordic countries' central banks.

Numerous factors influence bond prices, yet they generally exhibit a positive correlation with the policy interest rate set by central banks. Therefore, the key insight garnered from the results underscores the significance of acknowledging the detrimental effects of high-interest rates on PE. Consequently, these findings provide a direct indication of the adverse consequences of an overly cautious monetary policy exhibited by central banks regarding policy rates. Consequently, the study advises adopting a balanced approach in two aspects when determining interest rates: first, by maintaining rates at levels conducive to healthy inflation and economic growth, and second, by avoiding excessive caution that may negatively affect domestic PE activity.

10.3 Labor market regulation and unemployment

Upon examining the labor market dimension, both labor market flexibility in terms of regulation and unemployment were identified as determinants for total PE, VC, and BO investments. The explanatory variables demonstrated consistent effects across all investment categories for which they were found to be determinants: labor market flexibility served as a driver, while unemployment displayed adverse effects. Considering that both variables were determinants for three categories of PE, the significance of the labor market within the Nordic

investment environment should not be understated, thus meriting further discussion on the application of these results within a policy context.

10.3.1 The importance of labor market flexibility

Labor market flexibility concerning temporary contracts was identified as a determinant and driver of PE, VC, and BO investment activities. The Nordic countries exhibit relatively rigid labor markets in terms of collective and individual protection, yet they display considerable variation in the regulations governing the use of temporary contracts. Therefore, this study's findings imply that countries with more rigorous regulations regarding the use of temporary contracts may experience benefits in their PE activities if they were to relax these regulations.

A challenge associated with this strategy is that the Nordic socio-economic model heavily prioritizes safeguarding workers' rights, which may not align with the relaxation of labor market regulations. However, Sweden serves as a notable exception within the Nordics, as the country has far fewer restrictions on the use of temporary contracts. This may be a contributing factor to the Swedish PE market's dominance in comparison to the rest of the Nordic region. Drawing from the Swedish example, it might be feasible to integrate lighter regulation of the temporary labor market within the Nordic model while maintaining its core principles.

The findings may also insinuate that the established rigidness of Nordic labor markets could potentially exert a disadvantageous influence on the influx of risk capital into the region. As a result, this is likely to diminish the economic benefits provided by PE investments. Consequently, these results may call for a reevaluation of the cost-to-benefit ratio of rigid labor markets, given that they appear to diminish both PE investment levels and the associated economic benefits arising from such investments. In general, although stringent labor regulations undoubtedly provide advantages for employees, it is crucial to recognize the potential adverse effects on private investments, as demonstrated by this study.

10.3.2 Unemployment: an indicator

Unemployment was identified as a determinant for PE, VC, and BO investment, exhibiting a negative effect. As such, unemployment constitutes a significant variable for Nordic PE activity. However, providing policy suggestions aimed at unemployment reduction transcends the purview of this particular study. Still, unemployment can serve as an effective indicator of the underlying economic and investment conditions that influence Nordic PE activity.

The justification for positioning unemployment as a key indicator stems from the fact that other variables, representative of economic conditions such as GDP and inflation, demonstrated no statistical association with any of the dependent variables. Hence, unemployment may act as a proxy for the underlying economic circumstances influencing PE investments. Consequently, the significance of unemployment for policy implications resides in its potential as an indicator to monitor the underlying elements shaping the investment environment for PE in the Nordic nations.

10.4 R&D investments diminishing returns in the Nordics

In the dimension of R&D, both overall R&D expenditure and indirect public R&D expenditure through tax incentives were identified as determinants for various types of PE investments. However, overall R&D expenditure exhibited an adverse effect on total PE, BO, and G&T investments. In contrast, indirect public R&D expenditure through tax incentives was identified driver exclusively for G&T investments.

The outcomes of the two R&D-related variables diverge from most other findings on the topic of PE determinants, highlighting the distinctive characteristics of the Nordic PE market. This was particularly evident in the absence of an effect on VC activity, as discussed in-depth in the previous section. Nevertheless, even when a statistical relationship was identified, aggregate R&D investments exhibited a negative impact on total PE, BO, and G&T investments.

The observed effects of tax incentives for R&D were confined to influencing G&T investments exclusively. As discussed earlier, one explanation for these findings is that countries requiring tax incentives to increase R&D and innovation might be symptomatic of an ineffective and less competitive market, necessitating public intervention to address the issues. Consequently, tax incentives were found to be relevant only for those PE financing types that function as financial support for corporations in need of additional capital and experiencing financial distress. As such, the effects of R&D tax incentives can hardly be deemed advantageous in promoting PE activity that contributes to economic prosperity in the Nordics, particularly given that no economic benefits were identified in relation to G&T investments in the literature.

The policy suggestion based on these findings is to reconsider the emphasis on R&D as a universal solution for enhancing innovation and PE investments. The Nordic countries

generally have significantly higher R&D expenditure than the rest of Europe, as policymakers have highlighted R&D initiatives as the foundation for continued economic prosperity. Consequently, this study recommends that the Nordic countries explore alternative approaches to promote PE investments and entrepreneurial activity. With regard to tax incentives for R&D investments, the paper suggests that Nordic countries reevaluate, restructure, or even remove these incentives, as the current levels of expenditure show no substantial impact on the types of PE investments that have been empirically demonstrated to bring economic benefits.

10.5 The benefits of corporate taxes

In relation to the taxation dimension of the study, the analysis incorporated a single variable, the corporate tax rate. The corporate tax rate was identified as a determinant and driver of overall PE, VC, and G&T investments. Within the literature review, taxes were generally found to exert adverse effects on PE activity. As a conclusion from the discussion, the counterintuitive findings should be interpreted as an indication of the limited adverse impact that corporate tax rates have on PE activity.

In welfare states like the Nordics, taxes are an inevitable necessity for generating revenue to uphold the social contract of the Nordic model, which entails providing high-quality public services that require government expenditure. Consequently, the challenge lies in establishing a taxation framework that minimizes adverse impacts on the economy and market. As alternative literature identified the adverse effects on PE activity stemming from other forms of taxation, the results suggest that the corporate tax rate is the lesser of two evils in terms of its impact on PE investment activity in the Nordics. Hence, the policy recommendation is to employ the corporate tax rate as a means of generating state revenue rather than alternative forms of taxation, as it appears not to exhibit any adverse effects on PE activity in this study.

11. CONCLUSION

In this study, the Nordic PE investment landscape has been thoroughly examined. The research began with a brief introduction to PE, highlighting fund structure and various types of PE funds. The paper's second section emphasized the relevance of PE beyond its role as an investment instrument generating returns for investors and outlined the potential economic benefits derived from these investments. An initial literature review established VC as a capital allocation mechanism within the economy, offering added value through managerial advice and networking opportunities. LBOs were recognized as having a positive influence on firm incentives, leading to increased efficiency and improved resource utilization in the economy. In the following section, the specific attributes of the Nordic countries were presented, including the unique features that set this region apart from other European CMEs.

In the preliminary analysis, the Nordic PE market was situated within a global context, and its distinct characteristics were thoroughly examined. Furthermore, an initial examination of the Nordic investment activity was undertaken, which resulted in the observation that the Nordic PE market embodies a hybrid between more advanced LMEs while still sustaining a higher level of activity compared to most of their European CME counterparts. In light of this, the study sought to examine the factors that either encourage or hinder Nordic PE activity, considering that the transferability of findings from other markets appeared limited. Consequently, the research question for this thesis was formulated as follows: *What are the key determinants of private equity investments in the Nordics?*

To address the research question, a comprehensive literature review was conducted to discern factors that exert influence on PE investments in various markets. This review resulted in the establishment of five dimensions chosen as the focal areas of the research, namely the investment environment, economic conditions, labor market, R&D, and taxation. The data employed for the research comprised a cross-sectional time series for the Nordic countries spanning the years 2007 to 2019, yielding a total of 52 observations. In order to analyze the data, an RE model was applied based on the outcomes of the Hausman test.

In the investment environment dimension, IPOs and stock market liquidity emerged as determinants and drivers. Banks' credit exposure displayed contrasting size effects on VC and BO activities and, thus, was considered a neutral factor. Furthermore, the ratio of SMEs relative to large firms emerged as a determinant. The results show that an increased prevalence of large firms compared to SMEs positively influences PE investment activity.

Regarding economic conditions, only long-term interest rates were established as a determinant, exerting adverse effects on PE activity.

The labor market emerged as an influential dimension, with both labor market flexibility concerning temporary contracts and unemployment serving as determinants for three dependent variables representing PE investments. Labor market flexibility was found to be a driver, while unemployment demonstrated a negative relationship with PE investments. Surprisingly, R&D expenditure exhibited an adverse effect on PE investments, whereas the tax-incentivized indirect public expenditure was identified as an exclusive driver for G&T investments. Finally, contrary to expectations, corporate taxes were determined to have a positive relationship with overall PE and VC activity.

Building upon the findings and the identification of determinants influencing Nordic PE, the results were contextualized in terms of policy implications. Policy recommendations for the investment environment encompassed a shift towards a more stock-centered capital market by enhancing stock market liquidity and IPO activity. Additionally, the analysis suggested that PE could potentially reap benefits from an increased prevalence of large corporations. This finding prompts a proposal for the intensification of efforts to privatize SOEs and public infrastructure. In relation to economic conditions, the policy implications derived from the results suggest that excessively conservative monetary policies exhibit notable adverse effects on Nordic PE activity, which should be acknowledged when setting policy rates.

Advancing to the policy implications in the context of the labor market, the importance of reducing labor market inflexibility for temporary contracts was underscored. Concurrently, the utility of unemployment was highlighted as a valuable metric for evaluating the underlying determinants influencing PE activity. In terms of R&D, it was recommended that Nordic countries should refrain from increasing investments and explore alternative avenues to foster innovation and enhance the investment environment. A reevaluation, restructuring, or even removal of tax incentives for R&D expenditure was also advised. Lastly, corporate taxes were found to have an unexpected positive association with PE activity, indicating the preference for utilizing corporate tax as a public revenue source compared to other forms of taxation.

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APPENDICES

Appendix A: GDP tables

I. Comparison of GDP per capita

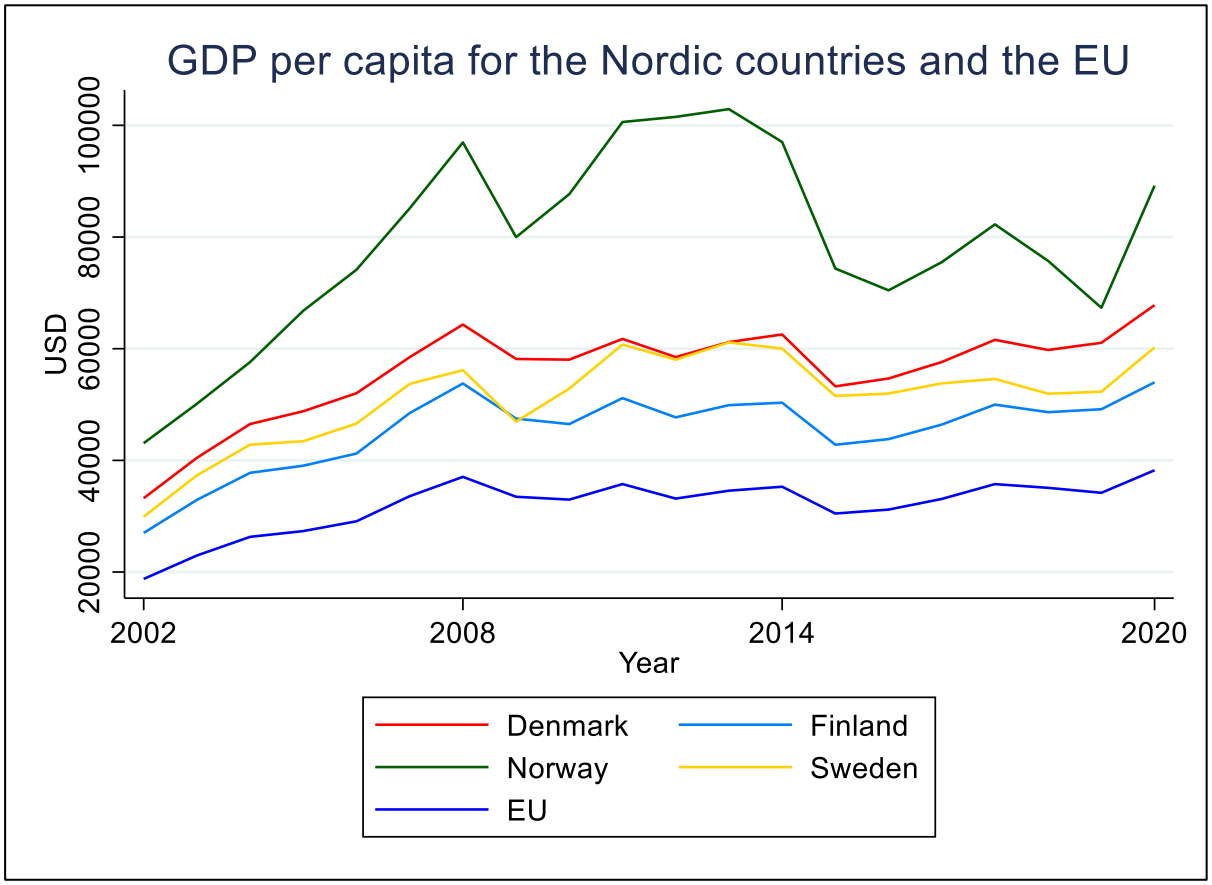

Figure 8: Comparison of GDP per capita for the Nordic countries and the EU.

The figure displays the GDP per capita in USD for the Nordic countries and the EU from 2002-2021. Data for this illustration was obtained from the World Bank's statistical database.

II. The Nordic countries' economic growth

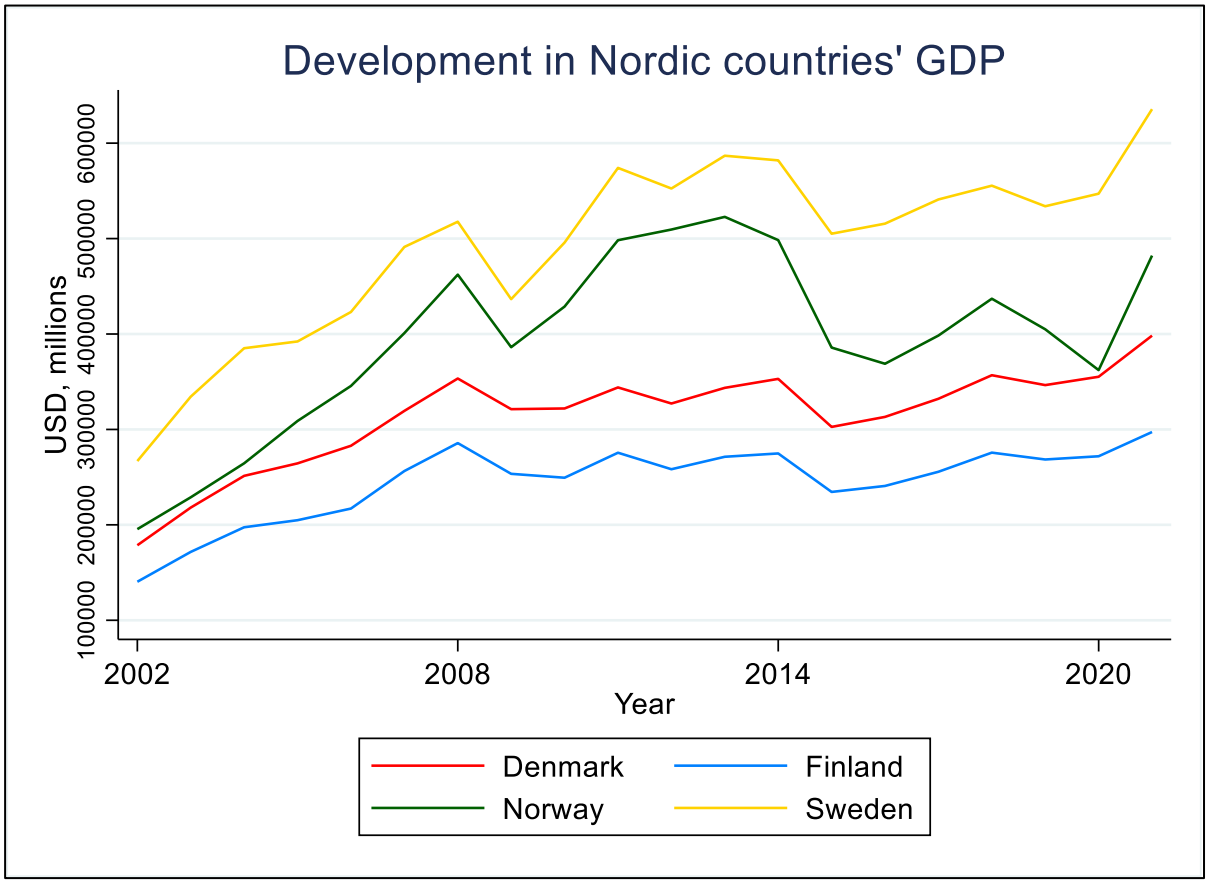

Figure 9: Development of GDP for the Nordic countries

The figure presents the GDP in millions for the Nordic countries during the period 2002 to 2021. The data was sourced from the World Bank.

Appendix B: International property rights index 2022

	Finland	Denmark	Sweden	Norway	United States of America	United Kingdom
IPRI	**8.173**	**7.806**	**7.601**	**7.798**	**7.566**	**7.299**
Legal And Political	8.739	8.467	8.174	8.524	6.759	7.352
Judicial Independence	9.398	8.621	7.684	8.349	7.038	6.946
Rule Of Law	9.158	8.718	8.613	8.968	7.736	7.994
Control Of Corruption	9.408	9.541	9.256	9.200	7.138	8.385
Political Stability	6.993	6.990	7.144	7.580	5.124	6.083
Perception Of Physical Property Protection	8.528	7.710	7.285	7.615	7.207	7.152
Property Rights Protection	9.337	8.335	7.537	7.935	7.600	7.493
Registering Process	8.761	8.741	8.086	8.413	6.545	7.706
Access To Financing	7.488	6.055	6.231	6.498	7.477	6.257
Protection Of Intellectual Property Rights	7.250	7.240	7.344	7.255	8.731	7.394
Perception Of IP Protection	9.222	7.770	7.687	7.464	7.828	7.551
Patent Protection	7.217	7.018	6.469	7.370	9.800	6.823
Copyright Protection	7.800	8.000	8.100	7.900	8.500	7.900
Trademark Protection	4.763	6.170	7.122	6.287	8.795	7.302

Table 12: Full IPRI ranking of the Nordic countries, the US, and the UK.

The table, representing the rankings for 2022, was sourced from the official International Property Rights Index (IPRI) website as a part of a comparative analysis.

Appendix C: OECD Indicators of Employment Protection

Strictness of employment protection – individual and collective dismissals (regular contracts)

Year	2014	2015	2016	2017	2018	2019	Mean
Sweden	2,62	2,62	2,62	2,62	2,62	2,62	**2,62**
Norway	2,31	2,31	2,31	2,31	2,31	2,31	**2,31**
OECD countries	2,27	2,27	2,27	2,26	2,25	2,26	**2,26**
Finland	2,11	2,11	2,11	2,06	2,06	2,06	**2,08**
Denmark	1,84	1,84	1,84	1,84	1,84	1,84	**1,84**
United Kingdom	1,60	1,60	1,60	1,60	1,60	1,60	**1,60**
United States	0,96	0,96	0,96	0,96	0,96	0,96	**0,96**

Strictness of employment protection – individual dismissals (regular contracts)

Year	2014	2015	2016	2017	2018	2019	Mean
Sweden	2,45	2,45	2,45	2,45	2,45	2,45	**2,45**
Norway	2,33	2,33	2,33	2,33	2,33	2,33	**2,33**
OECD countries	2,06	2,07	2,06	2,06	2,05	2,06	**2,06**
Finland	2,08	2,08	2,08	2,00	2,00	2,00	**2,04**
Denmark	1,53	1,53	1,53	1,53	1,53	1,53	**1,53**
United Kingdom	1,35	1,35	1,35	1,35	1,35	1,35	**1,35**
United States	0,09	0,09	0,09	0,09	0,09	0,09	**0,09**

Strictness of employment protection – temporary contracts

Year	2014	2015	2016	2017	2018	2019	Mean
Norway	3,00	3,00	2,50	2,50	2,50	2,63	**2,68**
OECD countries	1,74	1,73	1,74	1,72	1,70	1,74	**1,73**
Denmark	1,63	1,63	1,63	1,63	1,63	1,63	**1,63**
Finland	1,56	1,56	1,56	1,56	1,56	1,56	**1,56**
Sweden	0,81	0,81	0,81	0,81	0,81	0,81	**0,81**
United Kingdom	0,38	0,38	0,38	0,38	0,38	0,38	**0,38**
United States	0,25	0,25	0,25	0,25	0,25	0,25	**0,25**

Table 13: Overview of OECD indicators of Employment Protection.

The data presented in these tables are derived from the Employment Protection Indicators provided by the OECD. This data was employed as a proxy for labor market rigidity in the analysis and used to compare the Nordic countries within a global context.

Appendix D: Research and development

Research and development expenditure (% of GDP)

	2014	2015	2016	2017	2018	2019	Mean
Sweden	3,10	3,22	3,25	3,36	3,32	3,39	**3,27**
Denmark	2,91	3,05	3,09	2,93	2,97	2,89	**2,97**
United States	2,72	2,78	2,85	2,90	3,00	3,17	**2,90**
Finland	3,15	2,87	2,72	2,73	2,76	2,80	**2,83**
OECD members	2,41	2,43	2,48	2,51	2,59	2,67	**2,51**
Norway	1,72	1,94	2,04	2,10	2,05	2,15	**1,99**
United Kingdom	1,63	1,63	1,64	1,66	1,70	1,71	**1,66**

Researchers in R&D (per million people)

	2014	2015	2016	2017	2018	2019	Mean
Denmark	7311	7528	7847	7670	7636	7739	**7620**
Sweden	6876	6834	7155	7383	7536	7834	**7261**
Finland	7009	6845	6531	6722	6861	7228	**6863**
Norway	5686	5891	6078	6350	6433	6674	**6176**
United States	4206	4270	4251	4412	4749	4821	**4445**
United Kingdom	4228	4320	4358	4435	4554	4684	**4427**
OECD members	3467	3547	3565	3723	4031	4153	**3739**

Table 14: R&D expenditure and researchers in R&D per million inhabitants.

The data presented in these tables serve to compare Nordic R&D expenditure with that of other developed economies. The data were obtained from the World Bank's statistical database.

Appendix E: Hausman test

The choice between a Random Effects (RE) and Fixed Effects (FE) model was informed by the Hausman test, which reviews whether the differences in the coefficients of the two models are systematic. The Hausman test achieves this by comparing the coefficients derived from the RE and FE models and evaluating the systematic nature of any discrepancies. The null hypothesis posits that the estimators from the RE and FE models are statistically equivalent, with the alternative hypothesis suggesting the existence of systematic differences. In the absence of a significant systematic divergence, an RE model is preferred due to its capacity to take advantage of both within and between variations in the data.

Based on the summarized outcomes from the Hausman test in Table 15, it is evident that the chi-squared test statistic, and associated p-values for each variable, surpass the 0.05 threshold. These results uphold the null hypothesis, suggesting that the disparities in the coefficients are not systematic. Notably, the p-value for VCINV_GDP is 0.0572, closely bordering the conventional threshold. Despite this proximity, considering the other dependent variables' preference for an RE model and the p-value exceeding the typically accepted 5 percent threshold, no additional analysis for VCINV_GDP was deemed necessary. Consequently, the RE model was asserted as the model of choice and was employed in the subsequent analysis.

Hausman Test

Test of H0: Difference in coefficients not systematic

Dependent variable	Chi2 = (b-B)'[(V_b-V_B)^(-1)](b-B)	Prob > chi2
TOTINV	18,63	0,1351
TOTINV_GDP	13,72	0,3936
VCINV	23,91	0,1996
VCINV_GDP	29,59	0,0572
BOINV	16,83	0,2071
BOINV_GDP	9,59	0,7275
GTINV	1,43	0,9999
GTINV_GDP	0,72	1

Table 15: Hausman test results

Summary of the results obtained through the application of the Hausman test on the dependent variables to determine the suitability of employing either a FE or RE model. As illustrated, the Hausman test favors the implementation of an RE model.

Appendix F: Unit root discussion

One important consideration when working with longitudinal data is to explore the dataset for unit roots before initiating the analysis. Unit roots indicate that the data is non-stationary, which might lead to spurious estimates. A challenge associated with unit root tests is their relatively limited testing power. This is especially the case for small samples where the underlying process is stationary, but the tests fail to reject the null hypothesis indicating (often falsely) the presence of unit roots (Dickey & Fuller, 1981; Kwiatkowski et al., 1991). Hence, there is a high probability of false acceptance of non-stationarity when using small sample sizes, which is the case for the dataset utilized in this analysis.

Given these considerations, it becomes crucial to exercise caution when interpreting p-values from unit root tests applied to small sample sizes, particularly when determining the presence of a unit root. Under these circumstances, affording some leeway to the p-value and incorporating other factors, such as the magnitude of the unit roots, into the assessment could be beneficial. Moreover, due to the limited testing power of the unit root tests, the decision was made to evaluate the variables using multiple unit root tests.

The initial method of analysis deployed was the Breitung test, which evaluates the stationarity of the variables. The Breitung test is a comprehensive examination for non-stationarity in longitudinal data while considering cross-sectional dependency. Rejection of the null hypothesis by the test suggests stationarity of the variable, thereby confirming the absence of unit roots. Contrary, failure to reject the null hypothesis implies non-stationarity of the variable. It is crucial to acknowledge that the Breitung test, due to its rigorous criteria for stationarity, has an elevated likelihood of erroneously affirming the null hypothesis (Chang & Park, 2003). Consequently, the variables identified as non-stationary were re-tested to validate the results.

The second unit root examination undertaken was the Fisher-Type Augmented Dicky Fuller (ADF) test, specifically utilized for variables where the Breitung test had detected unit roots. The preference for the Fisher-Type ADF test was underpinned by research asserting its advantages over the original t-statistic (Elliott et al., 1996; Perron, 1990). The ADF test estimates the extent of the unit roots problem by investigating the prevalence of unit roots across all panels or confined to a subset of the panels.

The dependent variables employed in this analysis were initially subjected to the Breitung unit root test. The outcomes suggested that all dependent variables, with the exception of the level variables of total PE, VC, and BO investments, were stationary. In addition, the VC investment standardized by GDP also exhibited indications of unit roots. As a result, these variables underwent the subsequent ADF test to confirm whether the unit root issues were persistent across all panels or merely isolated instances.

The same testing strategy was applied to the explanatory variables identified from the literature review. The p-values for certain variables suggested the existence of unit roots, specifically in SM_liq, SME_LF, INT, labor_rig, UE, and RD_p illustrated in Table 16. Consequently, these variables were retested employing the ADF test. The outcomes were anticipated, considering the previous discussion about the high likelihood of erroneously accepting the null hypothesis due to the limited sample size of the dataset. Furthermore, the Breitung test is deemed stricter than other unit root tests. Given these considerations, the results from the Breitung test should be interpreted with caution, warranting further examination.

The Fisher-Type ADF test was then employed to retest the variables which suggested non-stationarity. In this test, only two of the remaining variables demonstrated non-stationarity, as shown in Table 17. The variables SM_liq and RD_p. SM_liq slightly exceeded the conventional critical value of 5 percent, with RD_p presenting the highest p-value. Nonetheless, given the small sample size utilized in this research, there is a considerable probability of incorrectly accepting the null hypothesis, as asserted by Dickey and Fuller (1981) and Kwiatkowski et al. (1991). Furthermore, Nelson and Plosser (1982) argue that the presence of unit roots in macroeconomic variables is less problematic (except for forecasting purposes), a premise that could be applicable to the two variables in question in this case.

To summarize, if any unit roots exist within the dataset, they are considered to be particularly minimal. This minimal presence is not anticipated to generate spurious results within the framework of the RE model chosen for this investigation. As such, the dataset is deemed fit for further analysis and is anticipated to yield causal results. Nonetheless, the potential non-stationarity of some variables will be taken into account in the section describing the limitations of this study.

Breitung unit root test

H0: Panels contain unit roots — Number of panels = 4
Ha: Panels are stationary — Number of periods = 13

AR parameter: Common — Asymptotics: T,N -> Infinity
Panel means: Included — sequentially
Time trend: Not included — Prewhitening: Not performed
Cross-sectional means removed

Variable	Lambda	P-value
TOTINV	1,4026	0,0804
TOTINV_GDP	2,4815	0,0065
VCINV	1,6305	0,0515
VCINV_GDP	1,0494	0,1470
BOINV	1,3237	0,0928
BOINV_GDP	2,3526	0,0093
GTINV	2,4122	0,0079
GTINV_GDP	2,5075	0,0061
IPO	2,0053	0,0225
SM_liq	1,0220	0,1534
SM_cap	4,6359	0,0000
bank_credit	2,9652	0,0015
SME_LF	1,4088	0,0795
GDP	4,7774	0,0000
INT	0,8309	0,2030
INF	2,4509	0,0071
labor_flex	0,0204	0,4918
UE	1,1406	0,1270
RD	1,9258	0,0271
RD_p	0,0182	0,4927
tax_c	1,8971	0,0289

Table 16: Summary of results from the Breitung unit root test.

The Breitung test was employed on both dependent and explanatory variables utilized in the analysis, as depicted in the figure above. The findings reveal the existence of unit roots for certain variables, which were further examined in a subsequent unit root test.

Fisher-type unit root test

Based on augmented Dickey–Fuller tests

H0: All panels contain unit roots — Number of panels = 4

Ha: At least one panel is stationary — Number of periods = 13

AR parameter: Panel-specific — Asymptotics: T -> Infinity

Panel means: Included

Time trend: Not included — Cross-sectional means removed

Drift term: Included — ADF regressions: 0 lags

Variable	Inverse chi-squared	p-value	Inverse normal	p-value	Inverse logit	p-value	Modified inv. chi-squared	p-value
TOTINV	33,5668	0,0000	-4,3085	0,0000	-4,7091	0,0000	6,3917	0,0000
VCINV	26,6116	0,0008	-3,56117	0,0002	-3,6988	0,0006	4,6529	0,0000
VCINV_GDP	26,9564	0,0007	-3,6054	0,0002	-3,7515	0,0005	4,7391	0,0000
BOINV	34,2797	0,0000	-4,3195	0,0000	-4,7979	0,0000	6,5699	0,0000
SM_liq	13,8063	0,0870	1,7652	0,0388	-1,6761	0,0534	1,4516	0,0733
SME_LF	20,1985	0,0096	-2,7636	0,0029	-2,7342	0,0058	3,0496	0,0011
INT	15,6335	0,0479	-2,1104	0,0174	-2,0134	0,0277	1,9089	0,0281
labor_flex	119,3082	0,0000	-9,2278	0,0000	-16,8124	0,0000	27,827	0,0000
UE	16,5351	0,0353	-2,2742	0,0115	-2,1718	0,0200	2,1338	0,0164
RD_p	12,0827	0,1476	-1,3657	0,0860	-1,3138	0,1007	1,0207	0,1007

Table 17: Summary of Fisher-type Augmented Dicky Fuller test.

The Fisher Type Augmented Dickey-Fuller test was applied to the non-stationary variables identified by the Breitung test. As displayed in the figure above, the test revealed a marginal presence of unit roots for a few variables, which was considered acceptable given the limited sample size utilized in the research.

Appendix G: General models without time-fixed effects

	(1) Total PE Investment	(2) Total PE investment/ GDP	(3) ln(Total PE Investment)	(4) ln(Total PE Investment/ GDP)
IPO	24.2529**	0.0001**	0.0108*	0.0130**
	(2.3219)	(2.4508)	(1.8868)	(2.2030)
SM_liq	-9.7e+02	-0.0015	-0.5729	-0.2894
	(-0.9498)	(-0.6397)	(-1.0228)	(-0.5038)
SM_cap	-2.5295	-0.0000	-0.0018	-0.0009
	(-0.7633)	(-0.5479)	(-1.0128)	(-0.4808)
bank_credit	-14.0895***	-0.0000**	-0.0050*	-0.0047
	(-2.7582)	(-2.0539)	(-1.7722)	(-1.6406)
SME_LF	-5.5731***	-0.0000***	-0.0019*	-0.0031***
	(-2.8012)	(-3.2785)	(-1.7446)	(-2.7606)
GDP	-31.7833	-0.0001	-0.0075	-0.0114
	(-0.7418)	(-0.5939)	(-0.3180)	(-0.4719)
INT	-1.8e+02	-0.0003	-0.1268**	-0.0930
	(-1.6344)	(-1.1937)	(-2.0653)	(-1.4773)
INF	56.9537	-0.0000	-0.0424	-0.0281
	(0.5667)	(-0.0370)	(-0.7686)	(-0.4973)
labor_flex	954.8022***	0.0015**	0.4893***	0.3580**
	(3.6904)	(2.5443)	(3.4457)	(2.4581)
UE	-1.2e+02	-0.0001	-0.1105***	-0.0336
	(-1.5337)	(-0.6039)	(-2.6133)	(-0.7745)
RD	-1.1e+03***	-0.0023***	-0.5097***	-0.4781***
	(-3.4890)	(-3.1199)	(-2.8743)	(-2.6284)
RD_p	5.9e+03	0.0155	3.0688	3.6969
	(0.9496)	(1.0602)	(0.8931)	(1.0490)
tax_c	157.0366**	0.0003**	0.0911***	0.0670*
	(2.5113)	(2.0209)	(2.6555)	(1.9033)
_cons	5.0e+03**	0.0121**	8.2984***	-4.1542***
	(2.0798)	(2.1578)	(6.3071)	(-3.0782)
N	52	52	52	52
r2_w	0.3298	0.3135	0.2970	0.2796
r2_o	0.8149	0.6679	0.8287	0.6515
r2_b	0.9997	0.9978	0.9991	0.9958

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) VC Investment	(2) VC Investment/ GDP	(3) ln(VC investment)	(4) ln(VC Investment/ GDP)
IPO	-0.3121	0.0000	-0.0027	-0.0005
	(-0.1602)	(0.0057)	(-0.4484)	(-0.0864)
SM_liq	182.4063	0.0006	1.1137*	1.3971**
	(0.9586)	(1.1588)	(1.9114)	(2.3009)
SM_cap	-0.6344	-0.0000	-0.0011	-0.0001
	(-1.0268)	(-0.6847)	(-0.5583)	(-0.0564)
bank_credit	0.3214	0.0000	0.0051*	0.0054*
	(0.3375)	(0.7373)	(1.7525)	(1.7642)
SME_LF	-0.9490**	-0.0000***	-0.0029**	-0.0041***
	(-2.5582)	(-3.0336)	(-2.5406)	(-3.4405)
GDP	4.6710	0.0000	0.0319	0.0280
	(0.5847)	(0.8174)	(1.3051)	(1.0992)
INT	-20.6865	-0.0000	-0.0801	-0.0463
	(-0.9918)	(-0.7816)	(-1.2542)	(-0.6961)
INF	-13.5640	-0.0000	-0.0505	-0.0362
	(-0.7238)	(-0.9972)	(-0.8799)	(-0.6059)
labor_flex	101.8919**	0.0002	0.4204***	0.2892*
	(2.1122)	(1.4830)	(2.8463)	(1.8786)
UE	-34.6781**	-0.0001*	-0.1565***	-0.0796*
	(-2.4138)	(-1.7061)	(-3.5583)	(-1.7366)
RD	-1.4e+02**	-0.0003*	-0.3884**	-0.3567*
	(-2.3804)	(-1.7980)	(-2.1051)	(-1.8554)
RD_p	304.4164	0.0005	-0.7545	-0.1264
	(0.2608)	(0.1754)	(-0.2111)	(-0.0339)
tax_c	19.6944*	0.0000	0.0711**	0.0470
	(1.6892)	(1.2452)	(1.9912)	(1.2620)
_cons	515.4194	0.0014	5.0484***	-7.4043***
	(1.1531)	(1.1907)	(3.6884)	(-5.1908)
N	52	52	52	52
r2_w	0.2675	0.2264	0.3605	0.3209
r2_o	0.5662	0.4932	0.7077	0.6280
r2_b	0.9952	0.9993	0.9984	0.9991

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Buyout Investment	(2) Buyout Investment/ GDP	(3) ln(Buyout investment)	(4) ln(Buyout Investment/ GDP)
IPO	21.0660**	0.0001**	0.0107	0.0128
	(2.2139)	(2.3492)	(1.3014)	(1.5640)
SM_liq	-9.6e+02	-0.0018	-0.8309	-0.5475
	(-1.0353)	(-0.8589)	(-1.0341)	(-0.6825)
SM_cap	-1.6728	-0.0000	-0.0017	-0.0008
	(-0.5542)	(-0.4082)	(-0.6556)	(-0.2938)
bank_credit	-12.1580***	-0.0000**	-0.0048	-0.0046
	(-2.6126)	(-1.9860)	(-1.1949)	(-1.1345)
SME_LF	-4.1563**	-0.0000***	-0.0011	-0.0023
	(-2.2932)	(-2.5925)	(-0.7228)	(-1.4830)
GDP	-27.6233	-0.0000	0.0085	0.0046
	(-0.7077)	(-0.5448)	(0.2512)	(0.1356)
INT	-1.6e+02	-0.0003	-0.1611*	-0.1274
	(-1.5302)	(-1.1296)	(-1.8296)	(-1.4487)
INF	89.6413	0.0001	-0.0012	0.0130
	(0.9791)	(0.4369)	(-0.0157)	(0.1648)
labor_flex	863.1219***	0.0014**	0.4771**	0.3458*
	(3.6620)	(2.5402)	(2.3420)	(1.7006)
UE	-1.1e+02	-0.0002	-0.1559**	-0.0789
	(-1.6334)	(-0.9388)	(-2.5691)	(-1.3034)
RD	-8.3e+02***	-0.0018***	-0.6560***	-0.6243**
	(-2.8225)	(-2.7044)	(-2.5783)	(-2.4582)
RD_p	3.2e+03	0.0081	1.2221	1.8501
	(0.5556)	(0.6267)	(0.2479)	(0.3760)
tax_c	97.7539*	0.0002	0.0680	0.0439
	(1.7160)	(1.3342)	(1.3820)	(0.8934)
_cons	4.4e+03**	0.0107**	9.0013***	-3.4514*
	(2.0140)	(2.1538)	(4.7688)	(-1.8317)
N	52	52	52	52
r2_w	0.2939	0.2848	0.2836	0.2742
r2_o	0.8040	0.6876	0.7912	0.6586
r2_b	1.0000	0.9997	0.9998	0.9989

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) G&T investments	(2) G&T investments/ GDP	(3) ln(G&T investments)	(4) ln(G&T investments/ GDP)
IPO	1.3443	0.0000	0.0026	0.0047
	(0.6466)	(0.4820)	(0.1905)	(0.3377)
SM_liq	-1.2e+02	-0.0000	-0.5738	-0.2903
	(-0.5952)	(-0.0944)	(-0.4293)	(-0.2116)
SM_cap	-0.1442	0.0000	0.0014	0.0024
	(-0.2187)	(0.0377)	(0.3315)	(0.5350)
bank_credit	-1.3898	-0.0000	-0.0126*	-0.0123*
	(-1.3670)	(-0.9504)	(-1.8780)	(-1.7928)
SME_LF	-0.1998	-0.0000	-0.0002	-0.0014
	(-0.5047)	(-0.7311)	(-0.0799)	(-0.5215)
GDP	2.5205	0.0000	0.0035	-0.0004
	(0.2956)	(0.4481)	(0.0632)	(-0.0062)
INT	-15.3813	-0.0000	-0.1739	-0.1402
	(-0.6908)	(-0.6519)	(-1.1873)	(-0.9320)
INF	-11.1183	-0.0000	-0.0761	-0.0619
	(-0.5558)	(-0.3095)	(-0.5783)	(-0.4578)
labor_flex	-19.9900	-0.0001	-0.0294	-0.1607
	(-0.3882)	(-0.4723)	(-0.0869)	(-0.4620)
UE	19.0006	0.0001*	-0.0375	0.0395
	(1.2390)	(1.6925)	(-0.3712)	(0.3809)
RD	-1.1e+02*	-0.0002	-0.4419	-0.4103
	(-1.6467)	(-1.1296)	(-1.0444)	(-0.9445)
RD_p	2.1e+03*	0.0056*	5.6800	6.3081
	(1.6645)	(1.7295)	(0.6928)	(0.7494)
tax_c	31.7323**	0.0001**	0.1526*	0.1285
	(2.5497)	(1.9681)	(1.8641)	(1.5287)
_cons	-48.5271	-0.0003	5.0700	-7.3826**
	(-0.1017)	(-0.2184)	(1.6149)	(-2.2905)
N	52	52	52	52
r2_w	0.2414	0.2121	0.1659	0.1615
r2_o	0.4370	0.3121	0.4022	0.3075
r2_b	0.9981	0.9974	1.0000	0.9986

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix H: General model with time-fixed effects

	(1) Total PE Investment	(2) Total PE investment/GDP	(3) ln(Total PE Investment)	(4) ln(Total PE Investment/GDP)
IPO	15.4357	0.0000	0.0093	0.0103
	(0.9203)	(1.1430)	(1.0018)	(1.1119)
SM_liq	-1.6e+02	-0.0004	-0.1400	0.0257
	(-0.1042)	(-0.1098)	(-0.1643)	(0.0302)
SM_cap	-12.5555	-0.0000	-0.0073	-0.0054
	(-1.1424)	(-0.9531)	(-1.1958)	(-0.8879)
bank_credit	-8.5395	-0.0000	-0.0044	-0.0042
	(-1.0822)	(-0.9980)	(-1.0129)	(-0.9711)
SME_LF	-4.1840	-0.0000*	-0.0022	-0.0031*
	(-1.2288)	(-1.6453)	(-1.1706)	(-1.6512)
GDP	-41.7311	-0.0001	-0.0155	-0.0246
	(-0.4588)	(-0.4351)	(-0.3087)	(-0.4902)
INT	-6.9e+02	-0.0020	-0.5980	-0.5635
	(-0.8619)	(-1.1127)	(-1.3610)	(-1.2860)
INF	110.0945	0.0001	0.0033	0.0084
	(0.7356)	(0.2877)	(0.0397)	(0.1022)
labor_flex	971.5327***	0.0016**	0.5831***	0.4355**
	(2.6809)	(1.9833)	(2.9119)	(2.1807)
UE	-95.5746	-0.0001	-0.1370*	-0.0489
	(-0.6768)	(-0.2601)	(-1.7563)	(-0.6287)
RD	-9.0e+02**	-0.0019*	-0.4731*	-0.4099*
	(-2.0595)	(-1.8770)	(-1.9549)	(-1.6982)
RD_p	9.4e+03	0.0305	9.2060	9.1251
	(0.7646)	(1.0897)	(1.3524)	(1.3441)
tax_c	207.5141	0.0003	0.0680	0.0525
	(1.5909)	(1.1113)	(0.9436)	(0.7310)
year_2007	1.8e+03	0.0072	2.1437	2.1395
	(0.4607)	(0.8091)	(0.9900)	(0.9908)
year_2008	506.9324	0.0047	1.4394	1.5292
	(0.1484)	(0.6039)	(0.7628)	(0.8126)
year_2009	1.2e+03	0.0054	1.7954	1.6519
	(0.3265)	(0.6321)	(0.8696)	(0.8023)
year_2010	986.7213	0.0045	1.5516	1.4598
	(0.3262)	(0.6488)	(0.9285)	(0.8759)
year_2011	-69.7563	0.0021	0.9756	0.8812
	(-0.0267)	(0.3536)	(0.6755)	(0.6118)
year_2012	-1.5e+02	0.0012	0.6995	0.6048
	(-0.0781)	(0.2818)	(0.6595)	(0.5718)
year_2013	590.8921	0.0029	1.1873	1.0275
	(0.2829)	(0.6091)	(1.0286)	(0.8926)
year_2014	21.0562	0.0010	0.6389	0.5146
	(0.0139)	(0.3007)	(0.7650)	(0.6179)
year_2015	-4.1e+02	0.0001	0.1891	0.2461
	(-0.4213)	(0.0589)	(0.3510)	(0.4580)
year_2016	-2.0e+02	0.0005	0.1334	0.2130
	(-0.3067)	(0.3338)	(0.3648)	(0.5839)
year_2017	-70.2112	0.0002	0.1410	0.1296
	(-0.0915)	(0.1315)	(0.3326)	(0.3067)
year_2018	-3.7e+02	-0.0006	-0.0982	-0.1366
	(-0.5133)	(-0.3525)	(-0.2450)	(-0.3418)
_cons	1.8e+03	0.0078	8.4965***	-4.2499*
	(0.3789)	(0.7396)	(3.2913)	(-1.6508)
N	52	52	52	52
r2_w	0.4489	0.4670	0.4181	0.4368
r2_o	0.8501	0.7448	0.8594	0.7297
r2_b	0.9998	0.9996	0.9995	0.9985

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) VC Investments	(2) VC Investments/GDP	(3) ln(VC investments)	(4) ln(VC Investments/GDP)	(5) ln(VC investments)	(6) ln(VC investments)
IPO	-1.5869	-0.0000	-0.0038	-0.0028	-0.0072	-0.0040
	(-0.6620)	(-0.4500)	(-0.5289)	(-0.4038)	(-1.1810)	(-0.6690)
SM_liq	-1.3e+02	-0.0004	0.1567	0.3224	-0.2263	-0.0630
	(-0.6005)	(-0.7017)	(0.2390)	(0.5092)	(-0.3710)	(-0.1010)
SM_cap	-0.7228	-0.0000	0.0013	0.0032	0.0063*	0.0082**
	(-0.4602)	(-0.0266)	(0.2798)	(0.7074)	(1.8093)	(2.4017)
bank_credit	0.4014	0.0000	0.0051	0.0053	0.0047*	0.0044
	(0.3559)	(0.5009)	(1.5242)	(1.6384)	(1.7301)	(1.5888)
SME_LF	0.5066	0.0000	0.0012	0.0003	0.0018	0.0009
	(1.0409)	(0.7592)	(0.8566)	(0.2463)	(1.2243)	(0.6603)
GDP	-6.7652	-0.0000	-0.0154	-0.0244	-0.0417	-0.0635*
	(-0.5204)	(-0.3787)	(-0.3977)	(-0.6545)	(-1.1716)	(-1.8322)
INT	-3.6e+02***	-0.0009***	-1.0428***	-1.0083***	-0.6539***	-0.5364***
	(-3.1523)	(-3.1871)	(-3.0843)	(-3.0885)	(-4.8479)	(-4.3844)
INF	-11.1757	-0.0000	-0.0594	-0.0542	-0.0841	-0.1103**
	(-0.5224)	(-0.8887)	(-0.9332)	(-0.8826)	(-1.4951)	(-1.9622)
labor_flex	7.4418	-0.0001	0.1245	-0.0231	0.0898	0.1369
	(0.1437)	(-0.5733)	(0.8082)	(-0.1551)	(0.6087)	(0.9110)
UE	-12.7535	-0.0000	-0.0737	0.0144	-0.0694	-0.0670
	(-0.6320)	(-0.0525)	(-1.2274)	(0.2487)	(-1.5360)	(-1.4323)
RD	7.3302	0.0001	0.0417	0.1050	0.0650	0.0003
	(0.1171)	(0.7058)	(0.2240)	(0.5838)	(0.3457)	(0.0016)
RD_p	897.7621	0.0017	1.0075	0.9265	-5.5800	-4.3281
	(0.5099)	(0.3978)	(0.1923)	(0.1832)	(-1.6259)	(-1.2442)
tax_c	21.5216	0.0000	0.0915*	0.0760	0.1138***	0.1100***
	(1.1544)	(0.8446)	(1.6492)	(1.4192)	(3.5074)	(3.2827)
year_2007	1.5e+03***	0.0038***	4.0718**	4.0676**	2.3885***	1.9908***
	(2.6177)	(2.7104)	(2.4437)	(2.5282)	(4.5067)	(3.9888)
year_2008	1.3e+03***	0.0035***	3.8925***	3.9822***	2.5682***	2.3742***
	(2.6924)	(2.9085)	(2.6807)	(2.8402)	(4.3442)	(3.9459)
year_2009	973.5069*	0.0025*	2.4434	2.2999	0.6010*	
	(1.8230)	(1.8784)	(1.5379)	(1.4992)	(1.8093)	
year_2010	863.4502**	0.0022**	2.3168*	2.2250*	1.1149***	0.8952***
	(1.9976)	(2.0535)	(1.8016)	(1.7918)	(3.5734)	(3.0098)
year_2011	737.0663**	0.0019**	2.0661*	1.9716*	1.1413***	1.0505***
	(1.9730)	(2.1014)	(1.8590)	(1.8373)	(3.2111)	(2.8848)
year_2012	302.1483	0.0008	0.6758	0.5812		
	(1.1015)	(1.1878)	(0.8281)	(0.7375)		
year_2013	440.9345	0.0011	1.1128	0.9531		
	(1.4770)	(1.4961)	(1.2530)	(1.1113)		
year_2014	347.0963	0.0009*	0.9972	0.8729	0.4915**	0.4375**
	(1.6070)	(1.6580)	(1.5518)	(1.4068)	(2.5668)	(2.2351)
year_2015	54.0415	0.0002	0.0415	0.0985		
	(0.3877)	(0.6237)	(0.1002)	(0.2461)		
year_2016	-12.4200	0.0001	-0.0164	0.0632		
	(-0.1313)	(0.2549)	(-0.0581)	(0.2326)		
year_2017	69.4908	0.0002	0.0450	0.0337		
	(0.6339)	(0.6191)	(0.1380)	(0.1069)		
year_2018	244.9852**	0.0007***	0.6438**	0.6054**	0.7057***	0.6910***
	(2.3635)	(2.6258)	(2.0876)	(2.0330)	(2.9978)	(2.8380)
_cons	-1.5e+02	-0.0002	2.8435	-9.9030***	2.4872*	2.7924*
	(-0.2310)	(-0.1109)	(1.4314)	(-5.1629)	(1.7741)	(1.9387)
N	52	52	52	52	52	52
r2_w	0.6417	0.6368	0.7041	0.7277	0.6338	0.5986
r2_o	0.7937	0.7707	0.8688	0.8566	0.8370	0.8198
r2_b	0.9997	1.0000	0.9994	0.9991	0.9994	0.9996

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Buyout Investment	(2) Buyout Investment/GDP	(3) ln(Buyout investment)	(4) ln(Buyout Investment/GDP)
IPO	14.9175	0.0000	0.0174	0.0184
	(0.9607)	(1.3178)	(1.2933)	(1.3685)
SM_liq	149.7825	0.0003	0.0844	0.2500
	(0.1049)	(0.0996)	(0.0683)	(0.2027)
SM_cap	-9.9235	-0.0000	-0.0063	-0.0045
	(-0.9753)	(-0.7574)	(-0.7206)	(-0.5069)
bank_credit	-5.6618	-0.0000	-0.0047	-0.0045
	(-0.7751)	(-0.7170)	(-0.7505)	(-0.7205)
SME_LF	-3.8256	-0.0000	-0.0036	-0.0045
	(-1.2136)	(-1.6369)	(-1.3085)	(-1.6389)
GDP	-43.4000	-0.0001	0.0149	0.0058
	(-0.5154)	(-0.4305)	(0.2045)	(0.0802)
INT	-2.0e+02	-0.0007	-0.4544	-0.4199
	(-0.2662)	(-0.4370)	(-0.7139)	(-0.6604)
INF	136.8081	0.0002	0.0537	0.0589
	(0.9873)	(0.5547)	(0.4486)	(0.4921)
labor_flex	940.7842***	0.0016**	0.6828**	0.5352*
	(2.8042)	(2.1354)	(2.3539)	(1.8469)
UE	-89.6438	-0.0001	-0.1939*	-0.1058
	(-0.6857)	(-0.3716)	(-1.7156)	(-0.9369)
RD	-7.0e+02*	-0.0017*	-0.8070**	-0.7438**
	(-1.7293)	(-1.8091)	(-2.3021)	(-2.1238)
RD_p	4.4e+03	0.0193	11.2378	11.1569
	(0.3867)	(0.7473)	(1.1397)	(1.1326)
tax_c	159.5345	0.0002	0.0200	0.0046
	(1.3211)	(0.8708)	(0.1919)	(0.0438)
year_2007	-1.8e+02	0.0018	1.5252	1.5210
	(-0.0490)	(0.2180)	(0.4863)	(0.4854)
year_2008	-1.4e+03	-0.0002	1.0497	1.1395
	(-0.4339)	(-0.0316)	(0.3840)	(0.4173)
year_2009	-5.5e+02	0.0007	1.5596	1.4161
	(-0.1597)	(0.0953)	(0.5215)	(0.4740)
year_2010	-4.9e+02	0.0005	1.1751	1.0833
	(-0.1752)	(0.0814)	(0.4854)	(0.4479)
year_2011	-1.2e+03	-0.0007	0.8860	0.7916
	(-0.4756)	(-0.1350)	(0.4235)	(0.3787)
year_2012	-7.6e+02	-0.0003	0.9062	0.8116
	(-0.4263)	(-0.0842)	(0.5899)	(0.5288)
year_2013	-1.9e+02	0.0009	1.4272	1.2674
	(-0.0996)	(0.2122)	(0.8536)	(0.7588)
year_2014	-5.7e+02	-0.0004	0.7078	0.5835
	(-0.4075)	(-0.1392)	(0.5851)	(0.4829)
year_2015	-5.7e+02	-0.0004	0.3476	0.4046
	(-0.6318)	(-0.2005)	(0.4453)	(0.5189)
year_2016	-3.5e+02	-0.0001	0.1090	0.1886
	(-0.5777)	(-0.0474)	(0.2058)	(0.3564)
year_2017	-3.4e+02	-0.0006	-0.0011	-0.0124
	(-0.4830)	(-0.3507)	(-0.0018)	(-0.0203)
year_2018	-6.2e+02	-0.0013	-0.2827	-0.3211
	(-0.9204)	(-0.8470)	(-0.4870)	(-0.5537)
_cons	1.1e+03	0.0064	10.3807***	-2.3658
	(0.2476)	(0.6530)	(2.7760)	(-0.6333)
N	52	52	52	52
r2_w	0.4009	0.4062	0.4018	0.3927
r2_o	0.8362	0.7422	0.8253	0.7139
r2_b	0.9998	0.9998	0.9996	0.9991

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) G&T investments	(2) G&T investments/GDP	(3) ln(G&T investments)	(4) ln(G&T investments/ GDP)	(5) G&T investments	(6) G&T investments
IPO	0.1265	-0.0000	-0.0206	-0.0196	-1.0333	-1.2998
	(0.0444)	(-0.7116)	(-1.1210)	(-1.0420)	(-0.4859)	(-0.6413)
SM_liq	-62.7812	-0.0000	0.2544	0.4200	-1.1e+02	-1.5e+02
	(-0.2397)	(-0.0650)	(0.1504)	(0.2425)	(-0.5587)	(-0.8058)
SM_cap	-1.9879	-0.0000	-0.0241**	-0.0222*	-1.6485*	-0.5880
	(-1.0649)	(-1.1960)	(-1.9973)	(-1.7977)	(-1.7407)	(-0.9464)
bank_credit	-2.6526**	-0.0000*	-0.0178**	-0.0176**	-1.8370**	-1.9233**
	(-1.9791)	(-1.6555)	(-2.0581)	(-1.9878)	(-1.9668)	(-2.0715)
SME_LF	-0.8660	-0.0000	-0.0028	-0.0037	-0.3956	-0.3179
	(-1.4974)	(-1.1757)	(-0.7535)	(-0.9700)	(-0.9683)	(-0.8876)
GDP	20.6279	0.0000	0.1150	0.1059	14.5249	-3.9647
	(1.3352)	(1.1161)	(1.1525)	(1.0368)	(1.0696)	(-0.4984)
INT	-1.2e+02	-0.0004	-1.5374*	-1.5029*	-25.9450	-16.6319
	(-0.8827)	(-1.1278)	(-1.7630)	(-1.6830)	(-1.1355)	(-0.8163)
INF	-0.0391	0.0000	0.1187	0.1239	-11.5059	-18.7521
	(-0.0015)	(0.3913)	(0.7234)	(0.7371)	(-0.6088)	(-1.0246)
labor_flex	37.0408	0.0001	0.4594	0.3118	1.9237	7.4772
	(0.6018)	(0.5298)	(1.1560)	(0.7661)	(0.0397)	(0.1587)
UE	-16.0849	-0.0000	-0.3371**	-0.2490	-1.1802	0.9640
	(-0.6706)	(-0.5500)	(-2.1769)	(-1.5701)	(-0.0798)	(0.0652)
RD	-1.9e+02**	-0.0003*	-0.6963	-0.6330	-1.5e+02**	-1.3e+02**
	(-2.5195)	(-1.6478)	(-1.4496)	(-1.2869)	(-2.4078)	(-2.1805)
RD_p	3.9e+03*	0.0090*	21.7835	21.7025	2.0e+03	1.7e+03
	(1.8829)	(1.6934)	(1.6123)	(1.5686)	(1.5569)	(1.5235)
tax_c	11.1032	0.0000	-0.0373	-0.0528	27.5599**	30.0033***
	(0.5011)	(0.1751)	(-0.2607)	(-0.3601)	(2.2141)	(2.5976)
year_2007	468.6739	0.0017	6.5477	6.5435		
	(0.7041)	(0.9734)	(1.5236)	(1.4868)		
year_2008	491.5170	0.0014	4.6913	4.7811		
	(0.8473)	(0.9495)	(1.2526)	(1.2466)		
year_2009	812.0003	0.0023	8.1602**	8.0166*	262.2238*	
	(1.2794)	(1.4068)	(1.9914)	(1.9104)	(1.6916)	
year_2010	639.6030	0.0019	6.6200**	6.5282*	218.9793***	186.9246***
	(1.2450)	(1.4539)	(1.9959)	(1.9220)	(3.0771)	(2.8111)
year_2011	356.0712	0.0010	3.4395	3.3451		
	(0.8020)	(0.9192)	(1.1999)	(1.1395)		
year_2012	359.3426	0.0010	3.6729*	3.5782*	48.8777	
	(1.1022)	(1.1492)	(1.7449)	(1.6600)	(0.5619)	
year_2013	407.8009	0.0011	4.1837*	4.0239*	73.4627	
	(1.1494)	(1.2023)	(1.8263)	(1.7153)	(0.8655)	
year_2014	283.7141	0.0008	2.6891	2.5648		
	(1.1052)	(1.1603)	(1.6225)	(1.5112)		
year_2015	159.1537	0.0005	1.6102	1.6672		
	(0.9608)	(1.1808)	(1.5056)	(1.5223)		
year_2016	196.5788*	0.0006**	1.2951*	1.3747*	115.6256*	128.8739**
	(1.7486)	(2.1137)	(1.7843)	(1.8494)	(1.8926)	(2.1385)
year_2017	207.9758	0.0006*	1.9299**	1.9186**	125.2871*	124.6531*
	(1.5963)	(1.9442)	(2.2943)	(2.2272)	(1.9367)	(1.9471)
year_2018	3.8532	0.0001	0.2236	0.1852		
	(0.0313)	(0.2573)	(0.2811)	(0.2274)		
_cons	1.1e+03	0.0023	11.7249**	-1.0215	381.0511	283.2696
	(1.3278)	(1.1391)	(2.2884)	(-0.1947)	(0.8169)	(0.6265)
N	52	52	52	52	52	52
r2_w	0.5524	0.5512	0.5266	0.5264	0.4907	0.4390
r2_o	0.6681	0.6080	0.6606	0.6089	0.6221	0.5838
r2_b	0.9997	0.9973	0.9999	0.9973	0.9989	0.9991

z statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$