
THE EFFECTS OF THE SPECIALIZATION OF PRIVATE EQUITY
FIRMS ON THEIR EXIT STRATEGY

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Abstract

In recent times, Private Equity (PE) and Venture Capital (VC) have grown exponentially in terms of assets under management and fundraising, leading several researchers to investigate the deal-making activity of its firms. However, there is a gap in the literature concerning the research on the effects of the PE and VC firms' specialization on their exit strategy. The present dissertation aims to contribute to the literature by studying the effects of industry and stage specialization on the preferred exit route of private equity and venture capital firms and the implications these have on the time to exit their portfolio companies.

To do so, a multinomial logit model and Cox proportional hazards model were employed to analyse the impact of eight key dimensions (location, specialization, firm type, experience, size, deal characteristics, portfolio firm characteristics and market conditions) using a sample of 185 private equity and venture capital exit transactions from 2016 to 2023, contemplating 185 target companies and 148 PE/VC firms. The first model was implemented to study which factors led to a preferred exit choice, whilst the second studied the time to exit of the different exit routes and the probability of exit by year.

Results show that the secondary buyout is the preferred exit strategy for all PE firms, but even more for industry-specialized firms. Industry-specialized firms also tend to exit their portfolio companies sooner. Meanwhile, VC firms preferred to exit via trade sale and IPO. IPO exits are less likely to occur after a year with a positive market return, while SBO tends to be delayed in such conditions. Finally, high-tech portfolio companies are more likely to be exited by SBO.

Key Words: Private Equity, Venture Capital, Exit Strategy, Specialization

JEL-Codes: G11, G24, G34

Resumo

Recentemente, a atividade de *Private Equity* (PE) e *Venture Capital* (VC) tem crescido significativamente, tanto em termos dos seus ativos sob gestão e de captação de fundos. Isto levou investigadores a estudarem a atividade das empresas destas indústrias. No entanto, existe uma lacuna na literatura sobre a investigação dos efeitos de especialização das empresas de PE e VC na estratégia de saída. A presente dissertação visa contribuir para a literatura ao estudar os efeitos de especialização em indústria e fase na estratégia de saída preferida das empresas de PE e VC e as implicações dessas estratégias no tempo de saída das suas empresas de portfólio.

Para tal, foi implementado um modelo *logit* multinominal e um modelo de riscos proporcionais de Cox para analisar o impacto de oito dimensões-chave (localização, especialização, tipo de empresa, experiência, tamanho, características da transação, características da empresa de portfólio e condições de mercado), usando uma amostra de 185 transações de saída de empresas PE e VC entre 2016 e 2023, na qual havia 185 empresas-alvo e 148 empresas de PE/VC. O primeiro modelo foi implementado para estudar os fatores que levavam a uma escolha de saída preferida, enquanto o segundo estudou o tempo de saída das diferentes estratégias de saída e a probabilidade de saída por ano.

Os resultados mostram que o SBO é a estratégia de saída preferida por todas as empresas de PE, particularmente para empresas especializadas indústria. As empresas especializadas em indústria tendem também a sair das suas empresas de portfólio mais cedo. Por outro lado, as empresas de VC preferem sair através de *trade sale* ou IPO. As saídas por IPO são menos prováveis após um ano de retorno positivo no mercado, enquanto o SBO tende a ser adiado nessas condições. Finalmente, as empresas de portfólio de alta tecnologia têm uma maior probabilidade de serem vendidas através de SBO.

Palavras-Chave: Private Equity, Venture Capital, Estratégia de saída, Especialização

Códigos JEL: G11, G24, G34

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1. Introduction

The investment world can be divided into two sub-categories: traditional and alternative. The former generally consists of long-only investments traded in the public global markets, i.e., the money, bond and stock markets, whilst the latter is comprised of investments that do not classify as traditional ones (Baker & Filbeck, 2013).

Alternative investments are typically associated with hedge funds, natural resources, private markets, real estate and infrastructure investments (Baker & Filbeck, 2013). In the world of private market investments, these tend to be described as those (i) closely negotiated between (ii) qualified investors (or their representants) and respective counterparties, (iii) meant to be held during the long-term, (iv) are characterized as being high risk and (v) high expected return, and (vi) carried out to create value (Demaria, 2020). The major investment subcategory within private markets is Private Equity, which, since its inception in the 1980s, has gained significant importance, particularly in the past decade. In 2024, it has been reported that the total assets under management (AUM) and fundraising is \$8.25 trillion and \$424 billion, respectively (McKinsey & Company, 2024).

The insurgence of the private equity (PE) industry has led researchers to investigate several aspects of PE firms and their activity, from value creation in a portfolio company dimension and an investor perspective and how they operate the whole process from entry to exit of their portfolio companies. All these dimensions are studied since resources are scarce, and their allocation should be optimal, with the ultimate objective being twofold: maximize risk-adjusted returns for investors and promote the well-being of all stakeholders by providing goods and services, creating jobs and growing the economy.

Nevertheless, several factors impact a PE firm's ability to create internal and external value, including its exit strategy to divest from a portfolio company. There are several exit routes a PE firm may decide to use to exit from a company, with the three most popular being Secondary Buyouts SBO, selling to another PE fund/firm, Trade Sale (selling to another firm, usually from the same industry of the target firm) and Initial Public Offering (IPO), selling the shares to investors in a stock exchange. Other exit routes are Recapitalization, Buyback and Liquidation. However, studies have shown that certain internal factors, such as industry and stage specialization of buyout firms, affect the preferred exit strategy of the firm (Rigamonti, et al., 2016; Jenkinson & Sousa, 2015). In particular, a study has proven that the specialization of PE firms confers them a competitive advantage

(Cressy, et al., 2007), whilst another has argued that for Venture Capital (VC)¹ firms stage diversification leads to better returns overall (Bartkus & Hassan, 2009).

The present dissertation aims to contribute to the existing literature that focuses on the specialization effects on the preferred exit strategy. It proposes to do so by investigating evidence from North America and Europe.

This dissertation is structured in the following manner. In Chapter 2, a literature review on private equity and venture capital, with a focus on North America and Europe, is presented. Chapter 3 explains the methodology and data sample collected to conduct the research. Chapter 4 presents the results of the study through a multinomial logit model and a Cox proportional hazards model. Finally, Chapter 5 closes the dissertation with the concluding remarks and study limitations.

¹ In this dissertation exit deals, from both PE and VC firms, are analysed. A PE firm is considered to be one that invests in more mature companies, i.e. late-stage financing and growth equity, whilst a VC firm invests more in start-up companies, i.e. early-stage financing.

2. Literature Review

2.1. Private Equity – Definition

Private equity (PE) is an alternative investment form to public market securities, and it refers to investments made in private companies, including venture capital (VC) or growth investment, as well as late-stage, mezzanine², turnaround (distressed³), and buyout investments (Cumming, 2012). In other terms “Private equity refers, typically, to the asset class of equity securities in companies that are not publicly traded on a stock exchange” (Cumming, 2012).

A multitude of investment activities can be associated with private equity, among the different types of private equity activity the most important fields are venture capital (equity financing of new or growing private companies), closely held companies and buyout funds (the buyout of established enterprises through private equity funds) (Baker & Filbeck, 2013). Venture capital and buyouts are usually associated in the literature as the two different main types of private equity investments (Baker & Filbeck, 2013).

Nevertheless, a division is identified in the literature regarding venture capital and leveraged buyouts (Kaplan & Strömberg, 2009). Mainly due to the use of debt in private equity leveraged buyouts. However, other types of buyouts can be described as more un-leveraged, such as management buy-ins (MBIs), management buy-outs (MBOs), investor-led buyouts (IBOs) or distressed private equity.

Venture capital and buyout differences are noticeable in a lot of aspects. Venture capital focuses on investing in start-ups or growing companies by acquiring a minority stake and having an investment horizon of five and seven years (Gorman & Sahlman, 1989). Venture capitalists often sit on their portfolio companies’ boards and provide help to the founders in managing the business throughout the investment horizon. This help often comprehends help in obtaining additional financing, strategic planning, management recruiting and operational planning (Gorman & Sahlman, 1989). Furthermore, venture capitalists create value by alleviating the financial constraints of their portfolio companies, which hampered their growth (Bertoni, et al., 2011). Moreover, unlike buyout funds, venture capital firms only invest in private companies (Metrick & Yasuda, 2011). On the other hand, similarly to buyout funds, venture capital funds are organized through a limited partnership

² Mezzanine private equity provides hybrid financing between equity and debt.

³ Distressed private equity provides funds for distressed companies in need of a turnaround.

where the venture capitalist acts as the general partner (GP) of the fund and the investors act as the limited partner (LP) (Metrick & Yasuda, 2011).

Buyout funds operate differently by acquiring a majority stake in a private or public company either by using a small portion of capital and financing the rest with financial debt, around 60 to 90 per cent, in the case of leveraged buyouts, or by using a greater amount of capital, in more un-leveraged buyouts (Chen & Wang, 2022). Also, differently from venture capitalists, buyout funds may decide to restructure the board and management of a company, particularly in the case of public companies, to improve the operations and corporate governance of their portfolio companies (Cumming, et al., 2007). The portfolio companies acquired by this type of funds also tend to be more mature as there is a greater dependency for PE-backed companies on cash flow (Bertoni, et al., 2011). Similarly to venture capital funds, a fee structure will be agreed upon with the general partners consisting of a fixed management fee over the committed capital, usually of 2 per cent, which is charged during the investment period of the fund, and a percentage of the profits, normally 20 per cent, after a hurdle rate has been achieved goes to the limited partners (Chen & Wang, 2022).

In this dissertation, a distinction will be made between private equity and venture capital. Private Equity will be defined as “equity investments in public or private companies that result in the purchase of a significant portion or majority control of the company” (Goff, 1999) and thus bears semblance to buyout funds, previously described. On the other hand, venture capital will be described as “equity investments in companies that have undeveloped or developing products or revenue” (Goff, 1999).

2.2. Private Equity – Market Overview

Private Equity started to gain some traction in the 1980s, due to a strong wave of leveraged buyouts (LBOs) of large public companies, particularly in the United States of America (Blundell-Wignall, 2007). This wave occurred due to both economic and regulatory reasons caused by the popularity of high-yield debt instruments, mainly credited to Michael Milkin of Drexel Burnham, the limitation of state antitakeover laws and the deregulation of certain industries, which led to an increase in mergers & acquisitions (M&A) activity that was not allowed in previous years (Cao, et al., 2016). It was predicted back then that leveraged buyout organizations would become the main corporate organizational form (Jensen, 1989).

After the collapse of the investment bank Drexel Burnham Lambert and, with it, the high-yield debt market, the buyout market entered into a period of stagnation in the 1990s and early 2000s (Cao, et al., 2016).

At the end of 2002, another LBO wave started; however, differently from the 1980s wave, the portfolio companies were less highly leveraged, and the pricing in the buyouts was lower than previously, as it was able to witness from the offer premiums and the price paid in relation to company fundamentals (Cao, et al., 2016). Many factors caused the resurgence of this wave, as interest rates were lower and debt funding was cheap, whilst conversely, equity financing was expensive after the dot-com bubble, and companies were presenting strong fundamentals (Blundell-Wignall, 2007). Nevertheless, when the global financial crisis (GFC) occurred in 2008, this led to the end of this wave as firms, both public and private, reduced spending in all areas, particularly in acquisitions, due to the large investment needed (Cao, et al., 2016).

After the global financial crisis, private equity and the main firms in the market began to rise again – Apollo Global Management, Blackstone Group, Carlyle Group and KKR (Chen & Wang, 2022). Although there is not only one single reason to explain this growth, the quantitative easing (QE) policies implemented post-global financial crisis by the United States Federal Reserve Bank (FED), the Bank of England, and the European Central Bank (ECB) provided easier access to credit to both households and business (Aryoubi, et al., 2020). This had an important effect on the private equity leveraged buyout market as this enhanced credit supply led to an increase in the fundraising level, although conversely limiting the number of lucrative assets and resulting in a higher risk for poor investment decisions (Aryoubi, et al., 2020).

The private equity industry has recently seen deal count decrease and global fundraising contracted as the macroeconomic challenges continued (McKinsey & Company, 2024). Following the peak registered in 2021 both in fundraising and deal activity, this robust trend continued in the first half of 2022, which was followed by a slowdown in the second half of the year (McKinsey & Company, 2024). 2023 was a particularly harsh year for the industry, as key indicators decrease significantly, the deal value fell by 37%, exit value slid even more by 44%, and fundraising declined, as 38% fewer buyout funds closed (Bain & Company, 2024). Moreover, private equity M&A volumes reached a 10-year low, 28% of total activity, down from nearly 40% in 2022, and exit activity registered a 15-year low (Goldman Sachs, 2024). This decline can be attributed to multiple factors, such as increased borrowing

costs, heightened macro and operational risks and a harsh institutional loan market (Goldman Sachs, 2024). Contrarily, dollar commitments in buyouts increased as multiple high-performing funds came to market, and interestingly, just 20 funds accounted for more than half of the buyout capital raised (Bain & Company, 2024).

On the other hand, private credit (PC) has surged recently, being an alternative to private equity, taking advantage of the increase in interest rates and becoming a distinct and scalable asset class that generates flexible financing conditions for companies (Goldman Sachs, 2024). In the first half of 2024, the private equity industry has shown signals that dealmaking had finally bottomed out, as “the industry’s precipitous decline in deal count over the past two years levelled off in early 2024” (Bain & Company, 2024). Deal value in 2024 is expected to roughly match 2018’s total. However, the buyout dry powder⁴ is 1.5 times greater than it was back then. Despite huge headlines of acquisitions that occurred lately, there’s little empirical evidence that the market is truly on the upswing (Bain & Company, 2024).

Sustainability has recently also become a topic closely associated with private equity, as the industry faces accusations of greenwashing by some of its critics, whilst others express concerns about whether the private equity firms prioritize sustainability objectives over financial returns (Boston Consulting Group, 2023). However, it has been shown that private equity firms have been more successful in reaching net zero carbon emissions at larger portfolio companies, being ahead of their public peers, than smaller ones (Boston Consulting Group, 2023).

Nevertheless, the private equity industry has increased in the past decades, becoming a mainstream investment option for diversifying risk and enhancing returns (European Central Bank, 2007). Typically, there are two ways to invest in private markets: through funds or through funds of funds. As investing in private companies bears several challenges, for instance, a high level of risk, a considerable amount of capital and significant expertise in navigating a transaction process, a great demand for professional investors surged, leading to the emergence of the private equity fund and fund manager, more commonly known as the general partner. In summary, unprofessional investors who are not as sophisticated as professional investors, such as high net-worth individuals (HNWI) or ultra-high net-worth individuals (UHNWI), are allowed to make investments, which the average investor is not

⁴ Dry powder is the amount of committed capital by investors to the private equity fund that is yet to be invested.

able, pool their capital together in intermediaries that buy into private equity funds that allow them to access private markets (Demaria, 2020).

Limited partnerships are the most used structure by private equity funds, composed of the general partner, the private equity firm, the limited partners, the institutional investors and high-net-worth individuals. The first is expected to provide a small portion of the fund's capital, usually 1%, and conduct the investment process, whilst the second is expected to provide most of the fund's capital. The duration of private equity funds is normally around 10 years. However, it can be agreed with the limited partners to extend the fund's duration by 2 years to exit investments made in portfolio companies. They work as a closed-end investment vehicle, where the general partner calls upon the committed capital of the limited partners to finance the acquisitions of the portfolio companies and remunerate the private equity firm, i.e. the general partner (Demaria, 2020).

As investors, i.e. limited partners, must pay huge upfront fees and share a considerable amount of their profits with the private equity firms⁵, i.e. general partners, the ways by which these professional investors who are considered specialists create sufficient value to provide attractive risk-adjusted returns has led to several research papers on the topic.

2.3. Private Equity – Impact and Value Creation

2.3.1. Theoretical Framework

Conceptually and theoretically, three factors drive value creation in the private equity industry: multiple expansion, operating performance improvements and debt repayment (Schlegel, 2019). Multiple expansion can be interpreted as an increase in the exit multiple in comparison to the entry multiple, meaning the private equity firm paid less per dollar of operational performance, i.e. EBITDA (Earnings Before Interests, Taxes, Depreciation and Amortisation), of the portfolio company than it sold for. This can be achieved, for example, by positive market timing or negotiation skills of the private equity professionals. Thus, value is created on fund level, i.e. for the investors and the private equity firm, but not on a

⁵ Private equity firms, the GPs of private equity funds, are mainly remunerated in three forms: (i) a fixed percentage of the fund's asset under management (AUM) or of the fund size/ committed capital by the LPs every year as "management fees" during the investment phase, which lasts between 3 to 5 years, (ii) a percentage of profits, commonly known as carried-interest, that come from exiting successful investments, and (iii) "transaction and monitoring fees", which depend on the number of completed deals of the fund and the number of active investments, respectively.

company level. This type of value creation can be classified as financial arbitrage.

On the other hand, value created at the company level is associated with improving operating performance (EBITDA) or repaying debt from the acquisition (Schlegel, 2019). A comparable structure, where changes in valuation multiples and operating performance are mentioned, but the overall use of leverage is defined as the third lever for value creation contrary to just the debt repayment, aligning better with the multi-effect of leverage in value creation described in the literature, has been proposed in previous literature (Achleitner, et al., 2011). It has been estimated that leverage accounts for one-third of private equity sponsors' returns, whereas operational and market effects account for the remaining two-thirds (Achleitner, et al., 2010).

There are 4 levers used to accomplish these types of value creation: Governance, Strategic, Operational and Financial. The governance levers seek to solve the principal-agent problem, i.e. aligning the interests of the managers of the portfolio companies to ensure they serve the best interest of the shareholders. This leads to more efficient and effective portfolio company management and value creation. The strategic levers concern the different decisions about the business's operations, for example, diversifying into a new business line, merging the portfolio companies into one, or divesting from a part of the business, which have the goal of value creation. Operational levers cover the different growth and efficiency measures, such as measures regarding marketing or sales and measures related to production and logistics. Lastly, financial levers regard the portfolio company's capital structure and net working capital (NWC) and their optimization (Schlegel, 2019). A similar lever structure for value creation composed of financial, governance and operational engineering has been proposed in previous literature (Kaplan & Strömberg, 2009). This last structure proposed by Kaplan and Strömberg is the main structure the literature centres upon, as there is significant overlap between the strategic and operational levers proposed by Schlegel. Thus, redundancy is avoided by focusing on the three main levers. Nevertheless, there has been literature that refers to strategy as a lever towards value creation and explores in great detail the different drivers of value creation (Hannus, 2015).

A theoretical model has also been developed to explore the advantages of private equity in fixing turnaround situations where corporate value creation could come from addressing operational problems, replacing management or changing the incentive structure. The study derived scenarios under which the transference of ownership to private equity before the implementation of a turnaround could emerge as an optimal solution, even when

the current ownership could implement the same operational changes as private equity (Cuny & Talmor, 2007).

For venture capital, a theoretical model was developed regarding firm size and the profit-sharing rule between VCs and entrepreneurs. Despite the limitations found in the model, the findings showed that the optimal VC's portfolio size is predicted to be positively related to the quality of the entrepreneurs and to the value of a successful project and to be negatively related to the disutility that the VC and the entrepreneurs have from exerting effort, and to the required initial investment in the projects. Furthermore, the model found that entrepreneurs' profit shares increase in the portfolio size (Bernile, et al., 2007).

The ownership structure of PE-backed companies is deemed to have an edge over the publicly-held corporations. It predicted that they would end publicly held corporations, regarding the resolution of the agency problems arising from "the conflict between owners and managers over the control of corporate resources" (Jensen, 1989). This occurs due to financial engineering compensation structures, which align both parties' interests, such as manager equity compensation and performance-sensitive compensation, that improve the operating performance of companies post-LBOs. Because of these lower agency costs, private equity firms can optimally leverage their portfolio companies more than their non-PE-sponsored counterparts whilst preserving value-maximization behaviour (Haque, 2023). Summarising, it is argued that lower agency costs lead to a reduced tendency to shift risks to debtholders, thus lowering the expected present value of bankruptcy costs and raising the optimal level of debt.

Moreover, private equity firms' strict control on their portfolio companies' boards of directors and the adoption of decentralized decision-making organizations with improved reporting mechanisms lead to better operating performance (Acharya, et al., 2011). Simultaneously, the financial side of leveraging the operations creates tax advantages for the portfolio companies and gives the managers incentives to generate cash to meet high interest and principal repayments, leaving no margin to waste capital on value-destroying projects (Jensen, 1986).

Also, private equity firms tend to target underperforming companies with unexplored growth and efficiency routes being carried out by experienced professionals who act as advisors to improve the strategic planning of the portfolio companies, who may need to make important decisions concerning their business, such as investing, divesting, or

restructure their business divisions or pursue a series of acquisitions (Guo, et al., 2009). Additionally, it has been found that if general partners are ex-consultants or ex-industry managers, they are able to outperform in deals which focus on internal value creation, whilst general partners with a background in finance, i.e. ex-bankers or ex-accountants, were able to outperform in deals with significant M&A events (Acharya, et al., 2011). The operating performance and profitability of portfolio companies also face an improvement if the private equity transactions are executed successfully by being subject to an investment with a specific underlying, bespoke value creation plan, contrarily to an “*ex-ante* selection of strategies” (Biesinger, et al., 2023).

Lastly, private equity firms enable portfolio companies to pursue growth opportunities that otherwise would be financially constrained from doing so, providing another form towards value creation and performance improvements (Cohn, et al., 2022). In this manner, private equity companies can be seen as liquidity providers during times of economic distress and, therefore, offer portfolio companies capital that places them in front of their competition concerning investing capacity (Juergens & Braun, 2022).

2.3.2. Empirical Evidence

Overall, a consensus has been reached in the literature about the positive value creation of private equity firms in their portfolio companies. However, there is still some discussion on whether private equity is good for the overall economy, with mixed results.

Evidence on value creation (returns and operational improvements)

Nevertheless, when comparing private equity to public equity on a return basis, it has been found that, on average, before 2006, buyout fund returns for all vintage years exceed those from public equity, averaging 3% to 4% annually (Harris, et al., 2015). On the other hand, post-2005 vintage year returns have been around the same as those of public markets. This has also been found to be true for European buyout funds. Whilst venture capital fund performance has varied significantly over time. North American venture funds from the 1990s outperformed in a substantial manner public equities, while those from the 2000s underperformed, and recent vintage years have seen a modest rebound. This fluctuation in returns has been attributed to capital flows, being found that performance for funds is lower when there are large aggregate inflows of capital to the sector (Harris, et al., 2015). Evidence

was also found of the positive and substantial effect of lagged aggregated investments and divestments on new funds raised, with gross domestic product growth (GDP) and the evolution of gross domestic savings (Balboa & Martí, 2003). Experience also plays a role in obtaining better returns, as a study has evidenced that existing funds accelerate their investment flows and earn higher returns when investment opportunities improve and the demand for capital increases. On the other hand, increases in supply lead to tougher competition for deal flow, leading private equity fund managers to cut their investment spending (Ljungqvist & Richardson, 2003).

In addition, a different study has shown that PE-backed companies experience increases in operating income (before depreciation), decreases in capital expenditure and increases in net cash flow. The mean and median increases in market value (adjusted for market returns) were 96% and 77% from two months before the buyout announcement to the post-buyout sale, suggesting that the operating changes were due to improved incentives rather than layoffs or managerial exploitation of shareholders through inside information (Kaplan, 1989a). Evidence from private equity buyouts of Financial Institutions also finds that value creation in the capital-intensive and highly regulated bank holding sub-segment is not diluted by financial leverage and depends 87% on operational improvement, despite market-timing's positive but limited impact on value creation. Furthermore, it was also shown that leveraged buyouts of financial institutions yield a median gross internal rate of return (IRR) of 29% and a median public market equivalent (PME) of 1.9 compared to a public financial services benchmark index. Also, the more capital-intensive bank holding sub-segment showed a median gross IRR of 23% and outperformed the public benchmark with a median PME of 1.5 (Graf, et al., 2009). In addition, a different study on the insurance industry found that private equity firms added value through regulatory and tax arbitrage that increased profits compared to their non-PE counterparts. Crucially, it was also found that the impact on consumer welfare is nuanced: in the short run, consumers benefited from more favourably priced products. However, the arbitrage strategy also exposed them to more risk, as annual expected losses scaled by capital buffers by 50%, which creates the possibility of consumer harm in the event of a downturn (Kirti & Sarin, 2024). Also, evidence from the UK during the global financial crisis found that PE-backed buyouts achieved superior economic and financial performance in the period before and during the GFC in relation to comparable firms that did not experience such transactions. The results showed positive differentials of 5% to 15% in productivity and approximately 3% to 5% in profitability for buyout firms, compared to non-buyout firms, and that revenue and employment growth for

PE-sponsored firms were positive during the sample period (Wilson, et al., 2012).

However, a different study uncovered that the average fund returns (net of fees) were approximately equal to the S&P500 even though significant heterogeneity across funds existed and that returns persisted strongly across subsequent partnership funds. Furthermore, better-performing funds were more likely to raise follow-on funds and larger funds. The relationship was concave, with top-performing funds growing proportionally less than average performers. At the industry level, market entry and fund performance were procyclical. Still, established funds were less sensitive to cycles than new entrants, showing that several results differ markedly from mutual funds' results (Kaplan & Schoar, 2005).

Moreover, it was documented that little evidence was found of PE-owned companies outperforming public firms in profitability or operational efficiency despite the use of much stronger incentives for their top executives and substantially higher debt levels. The study also found that the compensation and debt differences between PE-owned and public companies disappear over a very short period (one to two years) after the company goes public (Leslie & Oyer, 2008). In addition, it was found from leveraged buyouts of publicly traded U.S. companies that the PE-sponsored firms exhibited a substantial decline in investment and growth, with gains in free cash flow coming from a significant reduction in investment post-LBO and not operating improvements. It is suggested that the leveraged capital structure forces a change in investment philosophy, which is reflected in lagged declines in growth rates (Ayash, 2020). Also, it was shown that over the entire life of the fund, despite fund valuations being conservative and with a tendency of being smoothed (in relation to movements in public markets), valuations understate subsequent distributions by around 35% on average, a significant jump in valuations in the fourth quarter, when funds are normally audited, was found. This exception in conservatism was found during the time when private equity firms are usually raising capital for their follow-on fund, and once fund-raising is closed, there is a gradual reversal in valuations and reported returns, with performance figures reported by funds during fund-raising having little power to predict ultimate returns, particularly if IRR measures performance. The use of a public market equivalent measure increased predictability significantly. Ultimately, the results showed that investors should be extremely cautious about basing investment decisions on the returns, particularly IRRs, of the current fund (Jenkinson, et al., 2013).

Evidence on the effects of private equity on society

Private equity has often been criticized by those who claim that leverage buyouts lead to huge job loss and few gains in operating performance. However, it has been found that companies acquired by buyout funds post-acquisition exhibit greater job creation at expanding establishments than non-PE backed firms and that PE sponsored firms engage in more greenfield job creation than non-PE sponsored firms (Davis, et al., 2014). In relation to these findings, PE backed firms were found to participate more in acquisitions and divestures than non-PE backed firms (Davis, et al., 2014). Buyout firms have also been found to increase productivity, mainly through the directed reallocation of resources across units within their portfolio companies (Davis, et al., 2014). Nonetheless, a different study has found that job creation only occurs in buyouts of privately held firms. In fact, it was found that employment expands 13% after buyouts of private companies, whilst it shrinks 13%, on average, over two years after buyouts of publicly listed companies (Davis, et al., 2021). More importantly, this study found that “the effects of private equity buyouts on employment, productivity, and job reallocation vary tremendously with macroeconomic and credit conditions, across private equity groups, and by type of buyout” (Davis, et al., 2021).

Contrarily, research findings from multiple studies from the US and UK suggest that for leveraged buyouts, employment and wages both grow at companies that go through leverage buyouts, but at a somewhat slower pace than at other similar companies (Strömberg, 2009). Except for France, where firms that underwent leverage buyouts experienced both significantly higher employment growth and wage growth than other similar companies (Strömberg, 2009). Conversely, research from both the US and UK showed that firms that received private equity backing had substantially lower productivity and employment growth than other companies in the same sector before the buyout, indicating that private equity buyout firms usually invest in underperforming companies in need of repair (Strömberg, 2009). Studies have also lacked consistency with regard to concerns over job destruction. Still, neither are they consistent with the diametrically opposite position that buyouts are associated with especially strong employment growth (Strömberg, 2009). Regarding venture capital. US studies have found that firms with venture backing tend to consistently be larger than non-venture-backed companies at every stage of the company’s life cycle. Moreover, most companies going public are venture-backed, indicating that venture capital investment positively impacts new job creation (Strömberg, 2009).

Evidence on value creation (financial engineering)

In the previous chapter of this study, leverage was mentioned to be a value-creation lever for private equity deals in theoretical terms. In practice, it has been found that buyout leverage is unrelated to factors that drive public firm leverage. Still, rather, variation in economic-wide credit conditions is the main determinant of leverage in buyouts. Consequently, higher deal leverage is associated with higher transaction prices and lower fund buyout returns, indicating that acquirers overpay when access to credit is easier (Axelson, et al., 2013). In cross-border LBOs, LBO investment has been proven to be more common in countries with strong creditor rights than in countries with weak creditor rights and that club deals club deals⁶ are less common in countries with stronger creditor rights and less common in cross-border LBOs.

Moreover, premiums are lower in countries with stronger creditor rights and in cross-border deals (Cao, et al., 2015). The legal aspect also plays an important role in the acquisition process, as evidenced by an analysis of 210 developing countries' private equity investments, that transactions vary with nations' legal enforcement, whether measured directly or through legal origin. Investments in high enforcement and common law nations tend to use convertible preferred stock with covenants. In investments in low-enforcement and civil law countries, private equity firms tend to use common stock and debt and rely on equity and board control. Furthermore, transactions in high-enforcement countries have higher valuations and returns. While relying on ownership rather than contractual provisions may help to alleviate legal enforcement, the findings suggest that private solutions are only a partial remedy (Lerner & Schoar, 2005).

A positive effect generally attributed to leverage in the corporate finance literature is the tax shields generated by debt, with leveraged buyouts benefitting from this. A study found that the median value of tax benefits, estimated at the time the buyout firm goes private, has a lower bound of 21% and an upper bound of 143% of the premium paid to pre-buyout shareholders, with the results suggesting that tax benefits are an important source of the wealth gains in management buyouts (Kaplan, 1989b). Moreover, a different study also evidences that PE firms get some additional return from the incremental tax shields that result from higher post-LBO leverage and that LBO tax shields are an important component

⁶ A club deal is a private equity buyout where multiple private equity firms pool their capital to acquire a company. They are also known as syndicated deals (Cao, et al., 2015).

of the firm's purchase price (Knauer, et al., 2014).

Evidence on the preferred target companies of private equity funds

Regarding the pre-acquisition profile, evidence from Belgian takeovers suggests that private equity firms tend to acquire companies that do not report a high risk of failure, meaning that acquisitions are not a bankruptcy alternative and show higher liquidity and solvency than the industry's average. The study also evidenced that acquirers achieved a higher growth rate in total assets and sales than the acquired firms but experienced negative industry-adjusted liquidity. They were highly leveraged, indicating evidence of a growth-resource misfit within but a financial fit between acquirers and their targets (Camerlynck, et al., 2005). Evidence from Belgium also found that private equity involvement increased a company's willingness to recognize losses in a timelier fashion compared to the industry, size, and life-cycle matched non-PE sponsored firms. Additionally, it was documented that there were more powerful earnings quality effects for firms backed by independent and captive private equity investors compared to companies backed by government-related-PE-investors. There was no systematic variation in earnings quality across different levels of private equity ownership (Beuselinck, et al., 2009).

Contrarily, a different study has found that private equity firms disproportionately target companies with weak operating profitability and those with growth potential but are highly leveraged and dependent on external financing. Furthermore, it was evidenced that target firms grow quickly post-buyout, particularly those undertaking add-on acquisitions, and profitability increases for both profitable and unprofitable targets. This suggested that private equity firms create value by relaxing financing constraints for portfolio companies with strong investment opportunities and improving the performance of weak firms, whilst financial engineering plays a limited role (Cohn, et al., 2022). This has also been documented by a study of European acquisitions, where it was found that the level of cash that the target firms hold, the sensitivity of cash to cash flow and the sensitivity of investment to cash flow all decline, whilst investment increases after the acquisition. Moreover, these effects were stronger in deals that were more likely to be associated with financing improvements, suggesting that acquisitions relieve financial frictions in target firms, particularly when the target firm is relatively small (Erel, et al., 2015).

Evidence on syndicated deals

Syndicated or club deals have been used in private equity as a way to spread the risk in deals by multiple private equity firms or access a competitor's firm-specific resources, however, it has been documented that the lead investor in those deals is expected to exert a primary role and influence, driving the decision making of the consortium, as well as structuring and timing the deal (Sahlman, 1990). Evidence from the UK has found that syndication is more a response to the need to diversify risk than to share information and manage investments. Moreover, the selection of partners in these deals was due to past interactions, reputation, and investment style. Evidence suggests that competition in the venture capital market negatively influences a firm's decision to syndicate out a deal but is less significant for the decision to syndicate into a deal (Lockett & Wright, 1999).

Evidence on venture capital (effects of fund size and government involvement)

In the venture capital side of private equity, a convex (U-shape) relationship has been documented between fund size and firm valuations. Furthermore, it was found that firm valuations positively correlate to measures of limited attention. Moreover, a concave (inverse U-shape) relationship was shown between fund size and the venture's performance measured as the probability of successful exits, which is especially strong when the pre-money valuation of the investment is high. All these findings support the notion that there exists a diseconomy of scale in the venture capital industry, partly due to the constraints from the quality and quantity of human capital when fund size grows (Cumming & Dai, 2011). Regarding investment bias, a study showed that more reputable VCs (older, larger, more experienced and with stronger IPO [initial public offering] track record) and VCs with broader networks show less local bias, whilst staging and specialization in the technology industries increase VCs' local bias. In addition, a VC exhibits a stronger local bias when acting as the lead VC and investing alone. It was also found that distance matters for the eventual performance of VC investments (Cumming & Dai, 2010). Contrarily, a different study has documented major shifts like international flows with local factors, such as high-end human capital, deeper financial markets, a better business environment and military expenditure, which are considered important to attract international VC. Moreover, the findings indicated that network effects and/or fixed entry costs may be at work. China was found to be the largest net importer of VC, and France, Israel, Canada, and India were consistent net importers of VC deals (Aizenman & Kendall, 2012).

Government involvement in the venture capital world has been increasing throughout the years. Their involvement is done by setting up governmental venture capital (GVC) funds to foster the development of a private venture capital industry and alleviate the equity capital of young, innovative firms. The results from several studies have found that there have been successful GVC initiatives, such as the Australian Innovation Investment Fund, despite the lack of success in some countries (Colombo, et al., 2016). Nevertheless, evidence from Canada has found that enterprises financed by government-sponsored venture capitalists underperform on various criteria, including value-creation, measured by the likelihood and size of IPOs and M&As, and innovation, as measured by patents. The evidence suggests that this likely occurs due to a crowding-out effect on private venture capital and less effective treatment, i.e. mentoring and other value-added skills, by government-backed venture capital (Brander, et al., 2008). Another study with Canadian evidence found the crowding out effect present in relation to a Canadian tax-driven venture capital vehicle known as “Labour Sponsored Venture Capital Corporation” (LSVCC), which, in theory, is suggested to have higher agency costs and lower profitability than private venture capital funds, with the data being consistent with this view. However, the results found that the tax advantages associated with this vehicle led to a crowding-out effect for private venture capital, with the data suggesting that the effect has been significant enough to lead to a reduction in the aggregate pool of venture capital in Canada, going against one of the main goals of the vehicle: the expansion of the aggregate pool of capital (Cumming & MacIntosh, 2006a).

Evidence from Belgium has also documented that government VC-backed firms display significant reductions in productivity, whilst no significant differences in efficiency were found in companies backed by private VC compared with their non-VC-backed peers. Furthermore, significant efficiency reductions exist in government VC targets compared to their non-VC-backed peers (Alperovych, et al., 2015). Evidence from Germany has also documented that independent and corporate private equity providers tend to have a more pronounced role in corporate governance and monitoring of the companies they finance than bank-dependent and governmental funds, which often serve only as bridge investors (Tykvová, 2006). Contrarily, a different study has found that government programs often involve private capital investors, with collaboration being greater when governments are more effective, when programs target earlier-stage companies and when the local private venture market is more developed. It was also found that these collaborations occur mostly through joint equity investments and matching-funds requirements (Bai, et al., 2022).

Evidence on value creation (corporate governance and fund style drift)

Improved corporate governance post-acquisition by private equity firms has been proven to create value for portfolio companies, with a study showing that increases in value and return characteristics of LBOs were, to some extent, related to corporate governance mechanisms resulting from a leveraged buyout, particularly managerial equity holdings. Moreover, the study indicates that return characteristics and the probability of a positive return are mainly related to the size of the buyout target and acquisitions carried out during the holding period. In addition, it was found that the return characteristics between insider-driven buyouts and outsider-driven buyouts were different (Nikoskelainen & Wright, 2007). Following this, a different study found that improved corporate governance post-private equity acquisition led to, on average, significantly positive abnormal performance, which stayed positive in periods with low sector returns. This abnormal performance was evidenced to be due to greater growth in sales and greater improvement in EBITDA to sales ratio (margin) during the private phase in relation to the publicly listed peers (Acharya, et al., 2011).

A study has shown that there is a positive relation between style drifting, i.e. a deviation from the stated objectives of the fund, and investment performance, despite it being often viewed negatively by investors who buy into the fund (Cumming, et al., 2009).

Evidence on value creation (long-term effects)

A longer-term analysis of the effects of buyouts, specifically management-led buyouts (MBOs), showed that many smaller buyouts remain as independent buyouts for at least eight years after the transaction and that entrepreneurial actions concerning both restructuring and product innovation are important parts of entrepreneurs' strategies over a ten-year period or more. Additionally, the study found that on multiple financial ratios, buyouts substantially outperformed a matched sample of non-buyouts, particularly from year 3 onwards, and that buyouts were superior to matched non-buyouts with a productivity differential of 9% on average from year t+2 onwards. This evidence of superior longer-term performance indicates that venture capitalists should consider their investment perspectives carefully, specifically regarding exit versus second-round investment. For financiers the buyout concept can be successfully applied to growth and restructuring cases (Wright, et al., 1996).

Contrarily, evidence from the UK found that 56% of non-PE-backed buyouts remain in a buyout organizational form for at least 7 years after the original buyout transaction,

supporting the view that buyouts present long rather than short-term organisational forms. On the other hand, PE-sponsored buyouts exhibited higher exit rates, fewer early (less than 12 months) exits and fewer liquidations compared to their non-PE counterparts. Moreover, buyouts sponsored by PE syndicates tend to have shorter longevity. However, the most notable difference between PE-backed and non-PE-backed buyouts is the IPO exits, where many non-PE-sponsored buyouts exit early to the Alternative Investment Market (AIM) (Jelic, 2011).

Evidence on secondary buyouts

A study on private equity secondary buyouts⁷ deals found no evidence that secondary buyouts generated lower equity returns or offered fundamentally lower operational value creation potential. Still, it was shown that secondary buyouts obtain 28% to 30% more leverage than primary buyouts, even after controlling for debt market conditions. In addition, secondary buyouts were 6% to 9% more expensive than other buyouts (Achleitner & Figge, 2014).

There is a lot of evidence in favour of the view that private equity creates value, despite some studies suggesting otherwise. However, recent literature has studied the effects of specialization on value creation and the favoured exit strategy of private equity firms.

2.4. Private Equity – Effect of Specialization and Exit Strategy

The effects of specialization on private equity firms have been the subject of recent studies that have uncovered interesting findings. In this study the specialization effects which will be covered will be industry and stage specialization, particularly on exit strategies.

Formulating an exit strategy before acquisition has been documented to yield greater returns for private equity firms, making the choice of the exit path crucial to the whole process. A study on venture capital exits found that cross-border investments were exited more quickly than domestic investments, with the difference being driven by the cross-border investments in North America and that macro variables have to be taken into account when analysing the time of VC to exit the portfolio companies, which varies across regions,

⁷ Secondary buyouts are an exit path for private equity firms when they are divesting from a portfolio company, where they sell said portfolio company to another private equity fund.

explaining the differences in the time to exit between domestic and cross-border investments (Espenlaub, et al., 2015). Evidence from Europe found that controlling for firm performance, investors' characteristics and local exit conditions, the probability of exiting via trade sale positively correlates to cross-border investors' additional set of mergers and acquisitions (M&A) opportunities. Similarly, but with weaker statistical significance, it was also shown that exiting via IPO is positively affected by IPO volumes in the countries of cross-border investors (Bertoni & Groh, 2014). Evidence from Canada and the U.S. found that IPOs were the preferred exit path for highly valued companies, that write-offs (liquidations) were the preferred exit path for the lowest value companies and that buybacks showed surprisingly strong average returns, greater than those of secondary buyouts, contrarily to what was observed in Canada, which could be due to the small number of secondary buyouts in Canada (Cumming & MacIntosh, 2003).

Furthermore, a different study showed that the ability to mitigate information asymmetries and agency costs was a central factor in influencing exit outcomes (Cumming & Johan, 2008). In addition, a different study evidenced that VC-backed companies first exhibited an increased likelihood of exiting via IPO. However, after reaching a plateau, non-exited investments are less likely to exit via IPO as time increases. In contrast, trade sales exits were shown to have a hazard rate that was less time-varying. Additionally, economic factors such as syndicate size and composition, geographical location, and VC value addition impact exit outcomes (Giot & Schwiendbacher, 2007). Moreover, a study provided evidence that IPOs were more likely to occur in countries with a higher Legality index, with the data suggesting that, in fact, the quality of a country's legal system is much more directly connected to facilitating VC-sponsored IPO exits than the size of a country's stock market. Also, the data indicates that Legality is a central mechanism which mitigates agency problems between outside shareholders and entrepreneurs, fostering the mutual development of IPO markets and venture capital markets (Cumming, et al., 2006b).

Experience and reputation were shown to affect exit strategy and value creation. A study evidenced that companies backed by young venture capital firms are younger and more underpriced at their IPO than those of established venture capital firms. In addition, young venture capital firms had been on the board of directors for a shorter period of time at the IPO, held smaller equity stakes and the time of the IPO preceded or coincided with the fund-raising period for follow-on funds (Gompers, 1996). Another study showed that the timing of IPOs and selling decisions of venture capitalists confirmed the importance of reputation

as a determinant of the organization of the venture capital market and as a factor affecting insider selling decisions (Lin & Smith, 1998).

An analysis of IPO lockup agreements in the UK showed a 12-month increase in the median lockup period, which increases the (median) survival time by 27%. Moreover, the failure rates for IPOs with longer lockups are consistently lower than the failure rates for IPOs with shorter lockups, regardless of delisting reasons (Ahmad & Jelic, 2014). Furthermore, a different study of lockup agreements in the UK found that lockup agreements of London Stock Exchange (LSE) companies were much more complex and diverse than those of US companies, which usually standardize the lockup period 180 days after the IPO. In contrast, the average lockup period in the UK was found to be 561 days (Espenlaub, et al., 2001).

A comparison between venture capital and buyout-backed IPOs showed substantial short and long-performance differences. IPOs backed by venture capitalists are substantially more underpriced in the short run, which was suggested could be related to higher levels of information asymmetry. In the long run, return on assets and operating margins suggest that buyout-backed IPOs outperform those backed by venture capital despite not finding substantial differences in the risk-adjusted market performance, which suggests that buyout-sponsored firms' post-listing operating performance improvements are well-contained in the initial listing prices (Buchner, et al., 2019).

Evidence from Europe found that the average long-run performance of IPOs on second markets is significantly worse than that of main market IPOs. Despite this, second markets have allowed companies to raise funds at the IPO and in follow-on offerings (Vismara, et al., 2012).

Regarding the debate of specialization versus diversification, a study on venture capital found that venture capitalists who diversified across portfolio company stages of development had greater success in realizing IPOs of their portfolio companies and exiting their investments via acquisitions, whilst industry specialization had no significant impact on venture fund success rates (Bartkus & Hassan, 2009). On the other hand, a different study about late-stage PE firms has shown that industry specialization contributed to higher operating profitability by 8.5%. That stage specialization did not impact profitability but may spur growth. The study also found that the initial profitability of PE-backed firms was an important factor for post-buyout profitability. This suggested that skill in investment

selection and financial engineering techniques were more important than managerial incentives in generating higher PE company performance (Cressy, et al., 2007).

Evidence from Europe found that, in recent times, secondary buyouts had gained significant popularity relative to IPOs and trade sales, with 43% of exits being secondary buyouts. Moreover, the study found that the exit route depended on various portfolio company characteristics and that conditions in the debt and equity markets strongly influenced exit choice. These findings contradict previous literature that portrayed the IPO as the preferred exit route, with the analysis finding that private equity funds took advantage of “windows of opportunity” and the exit route that maximized value varied with market conditions (Jenkinson & Sousa, 2015).

The main study found that the effects of specialization of private equity firms on their exit strategy evidenced, regarding stage and industry specialization, that both industry and stage specialization of PEs increased the probability of exiting via IPO, whilst only industry specialization positively affected the likelihood of divesting through a trade sale. Lastly, SBOs were more likely for non-specialized investors (Rigamonti, et al., 2016).

3. Methodology and Sample Selection

Based on the literature review presented in the previous chapter, the research on the effects of specialization of private equity firms on their exit strategy remains relatively limited. Furthermore, many of the studies conducted share some important limitations since they focus only on leveraged buyouts, and the period of the analysis is before important world events such as Brexit, the Covid-19 pandemic and the Russia-Ukraine war, which also misses the massive growth of the private equity industry in the term.

Thus, this dissertation aims to give a broader and more recent perspective to the literature and to overcome the limitations of previous studies, particularly by including private equity and venture capital deals and not only LBOs, by analysing a more recent dataset and by studying the effects of specialization regarding the time to exit a portfolio company.

Two key research questions guide the present work:

Q1: What are the effects of the specialization of private equity firms on their exit strategy?

Q2: What are the effects of the preferred exit strategy on the holding period of the portfolio companies?

The ensuing sections of Chapter 3 present the methodology and the data selected to answer the research questions.

3.1. Methodology

Eight dimensions are considered to assess the effects of the specialization of private equity firms on their exit strategy: location, specialization, firm type, experience, size, deal characteristics, portfolio firm characteristics and market conditions. Additionally, to assess the effects of the preferred exit strategy on the holding period, another dimension was considered: the years to exit. Overall, 20 variables are adopted to evaluate the formerly mentioned dimensions (see Table 1).

The region where the private equity firm is headquartered is used to determine its location. Industry specialization is used to measure whether a private equity firm is specialized or not. The distinction between being a late-stage private equity firm or a venture capital firm determines firm type. The age of the firms is used as a proxy for experience, and

their AUMs are used as a proxy for their size. Deal characteristics include whether a deal is or is not captive, syndicated, co-invested and cross border. Age, number of employees and whether the portfolio firm is a high-tech firm are the variables used to assess maturity, size and industry under the portfolio firm characteristics dimension. Market conditions are assessed by the return of the Morgan Stanley Capital International (MSCI) index and whether the exit occurred during Brexit, the Covid-19 pandemic and the Russia-Ukraine War. These dimensions and variables have been used in previous research that has studied the effect of the specialization of PE firms on their exit strategy (Rigamonti, et al., 2016).

Years to exit was the variable used to assess the impact of the preferred exit strategy on the holding period. Previous research also used this variable to study the same effects (Jenkinson & Sousa, 2015).

Table 1 – Study dimensions and variables

Table 1 shows the dimensions and variables used in this dissertation.

Dimensions	Variables
Location	North American Firm Europe Firm
Specialization	Industry Specialization
Firm Type	Private Equity Firm Venture Capital Firm
Experience	Firm Age
Size	Assets Under Management
Deal Characteristics	Captive Syndicated Co-investment Cross-border
Portfolio Firm Characteristics	Target Age (maturity) Number of employees (size) High-tech target (industry)
Market Conditions	MSCI return Brexit Covid-19 Russia Ukraine war

The methodology employed in this study follows a similar one to existing literature (Rigamonti, et al., 2016; Jenkinson & Sousa, 2015). Firstly, a multinomial logit model is used to assess the characteristics that led to a particular preferred exit strategy out of three possible alternatives: Secondary Buyouts, Trade Sales, and Initial Public Offerings. This modelling approach fits the dataset as the dependent variable, which must be unordered and categorical, is defined as an exit indicator with mutually exclusive outcomes.

$$P(Y = j|X) = \frac{\exp(\beta_{j0} + \beta_{j1}X_1 + \beta_{j2}X_2 + \dots + \beta_{jp}X_p)}{1 + \sum_{m=1}^{k-1} \exp(\beta_{m0} + \beta_{m1}X_1 + \beta_{m2}X_2 + \dots + \beta_{mp}X_p)} \quad (1)$$

For $j = 1, 2, \dots, k-1$, and for the reference category ($j=0$):

$$P(Y = 0|X) = \frac{1}{1 + \sum_{m=1}^{k-1} \exp(\beta_{m0} + \beta_{m1}X_1 + \beta_{m2}X_2 + \dots + \beta_{mp}X_p)} \quad (2)$$

Where

$P(Y = j|X)$ (probability of the outcome being in category j given the predictors X)

$\beta_{j0}, \beta_{j1}, \dots, \beta_{jp}$ (coefficients associated with the j – th outcome category)

$X = (X_1, X_2, \dots, X_p)$ (predictor variables)

Secondly, a proportional hazards model for sub-distribution is employed to determine the effects of the preferred exit strategy on the holding period of the portfolio company (Fine & Gray, 1999). Survival analysis has been extensively used in PE exit strategy analysis (Giot & Schwienbacher, 2007; Bertoni & Groh, 2014). Identically to the previous model, it's distinguished between three mutually exclusive risk events: the three exit strategies that are the object of study: SBOs, trade sales and IPOs. A time-to-exit variable was used to observe the effects, as previously mentioned. The hazard function gives the conditional instantaneous probability of exit given that the deal was not exited at that time (the hazard rate)⁸ (Jenkinson & Sousa, 2015).

$$\lambda(t) = \lim_{\Delta t \rightarrow 0} \left(\frac{\Pr(t \leq T < t + \Delta t | T \geq t)}{\Delta t} \right) = \frac{f(t)}{S(t)} = -\frac{S'(t)}{S(t)} \quad (3)$$

Where

$S(t) = \Pr(T > t) = 1 - F(t)$ (survivor function)

$F(t) = \Pr(T \leq t)$ (exit time distribution function)

$f(t) = dF(t)/dt$ (density function of exit time distribution)

⁸ Also named the intensity function, the conditional failure rate or the inverse Mills ratio, “is the instantaneous rate of failure” (Cleves, et al., 2010).

Finally, several tests were carried out to verify the statistical significance and robustness of the results. Firstly, a joint significance test was conducted to check whether the chosen variables had significant explanatory power. Secondly, a Variance Inflation Factor (VIF) test was run to check for multicollinearity in the dataset. Thirdly, the Ramsey RESET (Regression Specification Error test) was performed to detect if the model omitted variables or incorrect functional form. Lastly, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity was employed to check whether the variance of the errors from the regression model is constant, which is an assumption of ordinary least squares (OLS) regression. The model passed all these tests for both a level of significance of 5% and 10%, which led to the conclusion that the variables add significant explanatory power, the model was well-specified, and did not register the presence of either multicollinearity or heteroskedasticity.

Table 2 lists the variables employed in the model, alongside their definitions. Moreover, in syndicated deals, it is referred exclusively to the lead investor because it is expected to play a primary role and influence, driving the decision-making of the consortium, as well as structuring and timing in the deal (Sahlman, 1990; Rigamonti, et al., 2016). The lead investor is identified as the PE firm that, at the date of entry, was explicitly mentioned as a syndicate leader or held the largest equity stake of the acquired company.

Table 2 – Variables definition

Table 2 shows all the variables used in this dissertation and how they were extracted.

Deal Variables	
Exit	The dependent variable which assumed value 0 if the exit form is a secondary buyout, value 1 if the exit form is a trade sale, and value 2 if the exit form is an IPO.
Deal Value	The value obtained by the sale of the portfolio company at the moment of the exit (used only in the descriptive statistics).
Years to exit	The total number of years that the PE firm owned the portfolio company (used in descriptive statistics and hazard model).
PE variables	
NA Firm	A dummy variable equal to 1 if the PE firm was headquartered in North America, and 0 otherwise.
EU Firm	A dummy variable equal to 1 if the PE firm was headquartered in Europe, and 0 otherwise.
Industry Specialization	A dummy variable equal to 1 if the PE firm was specialized in certain industries, and 0 otherwise (according to the information obtained in their website).
PE Firm	A dummy variable equal to 1 if the PE firm was a late-stage private equity firm, and 0 otherwise (according to the information obtained in their website and <i>in Orbis M&A</i>).
VC Firm	A dummy variable equal to 1 if the PE firm was a venture capital firm, and 0 otherwise (according to the information obtained in their website and in <i>Orbis M&A</i>).
Firm Age	The age in years of the lead PE firm at the time of the entry (log transformed in the regression analysis).
Firm Size	The amount of capital under management in millions of dollars of the lead PE at the year of the entry (log transformed in the regression analysis).
Captive PE	A dummy variable equal to 1 if the investor is bank, insurance or government affiliated, and 0 otherwise (according to the information obtained in their website and in <i>Orbis M&A</i>).
Syndication	A dummy variable equal to 1 if the deal is syndicated, and 0 otherwise.
Co-investment	A dummy variable equal to 1 if the lead PE invested in the deal using more than one of its funds, and 0 otherwise.
Cross-border	A dummy variable equal to 1 if the investment is cross-border, and 0 otherwise.
Target variables	
Target Age	The age in years of the target at the time of entry (log transformed in the regression analysis).
Target Size	The number of employees of the target (log transformed in the regression analysis).
Target High-tech	A dummy variable equal to 1 if the target belongs to a high-tech industry (defined by UK SIC code and its description), and 0 otherwise (according to the information obtained in their website and in <i>Orbis M&A</i>).
Market Conditions	
MSCI return	The Morgan Stanley Capital International annual world index (MSCI) return in the year prior to exit.
Brexit	A dummy variable that takes value 1 if the exit occurs over the period 23rd of June 2016 to 31st of January 2020, and 0 otherwise (period between the Brexit referendum and the exit of the UK from the European Union).
Covid-19	A dummy variable that takes value 1 if the exit occurs over the period 11th of March 2020 to 5th of May 2023, and 0 otherwise (Covid-19 pandemic period according to the World Health Organization).
Russia Ukraine War	A dummy variable that takes value 1 if the exit occurs after the 24th of February 2022, and 0 otherwise (starting date for the Russia Ukraine war).

3.2. Sample Selection

The sample was extracted from the *Orbis M&A* database and crosschecked with each PE company website.

The initial criteria introduced to filter for relevant deals were: i) only private equity and venture capital transactions; ii) confirmed exit transactions that occurred between 2016 and 2023; iii) transactions involving only North American and European target companies; iv) transactions where the deal value was known publicly; v) transactions that represented an exit for a private equity firm. A total of 333 suitable deals were retrieved.

Afterwards, it was only considered deals for which the following information is available: i) timing of the investment (the date of entry and the date of the exit); ii) exit route; iii) characteristics of both the target company and the PE firm. Furthermore, transactions involving non-financial acquirers representing minority stake exits⁹ were also excluded.

A total of 185 deals, with 185 target companies and 148 private equity acquirers, were included in the final sample. A summary of the sample selection can be viewed in Table 3.

Table 3 – Sample selection summary

Table 3 shows the selection process to obtain the final sample used in this dissertation.

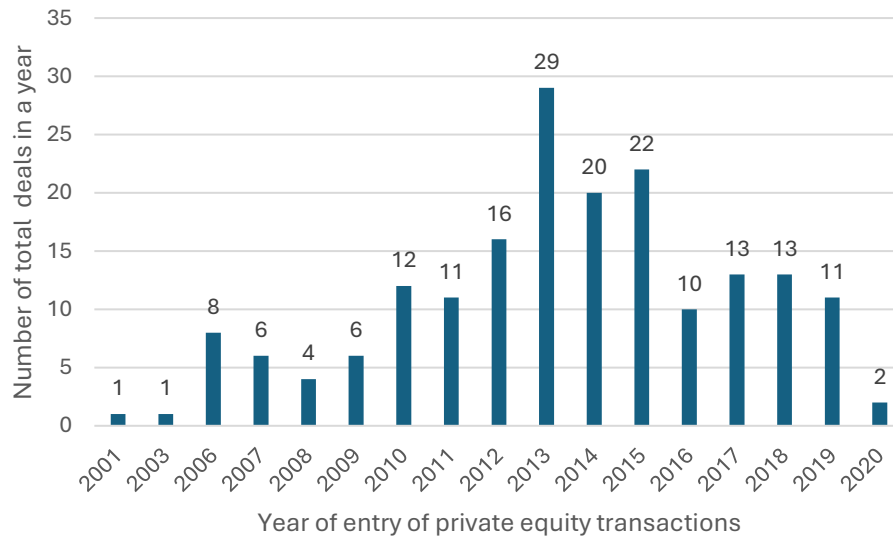
	Number of transactions
Initial Sample	
Criteria:	
Type: Private equity	
Time period: 2016-2023	333
Geography (target company): North America and Europe	
Deal Value: Known	
Deal Type: Exit	
Exclusions:	
Missing deal information	40
Missing accounting information	36
Minority Stake Investments	70
Repeated Deals	2
Final Sample	185

⁹ In the case of minority stake exits it refers to exits where a minority stake had already been sold in the past (i.e. the sale of shares of a portfolio company post-IPO) and in deals where a majority stake or the entirety of the portfolio company is not sold to one investor or consortium (i.e. deals where if the shares of the portfolio company are dispersed to many investors with minority stakes, only one of them exits the company, instead of combine sale of their stake (representing a majority stake) to one investor or consortium.

3.3. Sample Description

The yearly distribution of the private equity transactions at the time of entry is shown in Figure 1.

Figure 1 – Number of sample deals per entry year (2001-2020)



Given the exit period chosen for this study (2016-2023), it is not surprising to see that most of the deals at the time of entry occurred between 2010 and 2015, representing 59,45% of the total deals of this sample. Interestingly, this occurs post-GFC and pre-Brexit, which may lead to the conclusion that the Brexit referendum that occurred in 2016 harmed the private equity industry. Moreover, we can still observe the effects of the GFC on private equity dealmaking activity as after 2006, there was a drop-off in the number of deals, which only recovered in 2010.

Due to the exit period ending in 2023, it is impossible to draw any conclusions regarding a fall in deal-making caused by the pandemic. However, as it was mentioned in the literature review (see chapter 2.2), Covid-19 negatively affected the private equity industry in 2020, which was followed by a peak in fundraising and deal activity in 2021.

Table 4 shows the yearly distribution of private equity exits by exit strategy. The distribution of exit types is consistent with previous literature about the private equity industry (Kaplan & Strömberg, 2009). Out of the 185 investments in the dataset, 126 were exited by 2019, representing 68,10% of the total deals in the sample. In detail, 148 companies are divested through a private sale, 90 of which by SBOs (about 48,65% of exited deals) and

58 by trade sale (about 31,35% of exited deals); IPOs was used to divest 37 companies (about 20% of exited deals). Finally, of the total 185 exit deals, 104 were exited by North American firms (about 56,21% of exited deals) and 81 by European firms (about 43,78% of exited deals), and no single firm participated in more than 5 deals included in the dataset.

Table 4 – Number of sample deals per exit year (2016-2023)

Table 4 shows the number of exits per year and exit route of the sample used.

Exit Year	Deals	Exited by		
		SBO	Trade sale	IPO
2016	29	12	10	7
2017	53	31	11	11
2018	27	15	6	6
2019	17	5	6	6
2020	16	5	8	3
2021	22	10	8	4
2022	12	7	5	0
2023	9	5	4	0
Total	185	90	58	37
% of total sample	100%	48.65%	31.35%	20.00%

3.3.1. Descriptive Statistics

Table 5 – Descriptive statistics full sample

Table 5 shows the descriptive statistics of the full sample.

	Obs	Mean	Median	Min	Max
Deal Value (\$ million)	185	1,046.13	369.97	6.27	18,500
Years to Exit (y)	185	5.19	4	1	17
Firm Age (y)	185	25.69	22	0	148
AUM (\$ million)	185	16,772.56	3,500	30	366,600
Target Age (y)	185	26.55	17	0	159
Number of employees (u)	185	3,286.92	475	3	270,000
MSCI Return (%)	185	8.83	7.51	-18.14	39.49

Several noteworthy remarks can be made when analysing Table 5. Firstly, there exists a considerable difference between the mean and median values, which was treated by transforming the variables related with age and size (PE age, Target age, AUM and Number of employees) into their logarithmic form in the regression analysis. Therefore, the analysis made in this table and the following ones will consider only median values to diminish the importance of the outliers in the data. Secondly, we can see that the median deal value for the overall sample is around 370 million dollars, with the median firm size being 3.5 billion dollars in AUM and its median age of 22 years. Thirdly, the median time to exit for a private equity firm is around 4 years, which is consistent with the normal holding period of a portfolio company, with its median age being 17 years and its median number of employees being 475.

Descriptive Statistics by Exit Type

In Table 6, multiple interesting findings can be observed. The deal value is primarily bigger for SBOs than for trade sales and IPOs. The latter was to be expected as an IPO is usually a partial exit rather than a full exit, which tends to lead to an initial lower deal value. Also, portfolio companies exited via IPO tend to have a larger holding period than firms divested by SBO or trade sale. Moreover, PE firms that typically exit their portfolio companies via SBO are usually older and have a higher amount of AUM than PE firms that exit via trade sale or IPO. Furthermore, portfolio companies divested by SBO tend to be more mature and have a higher number of employees than firms that exit via trade sale or IPO. Lastly, portfolio companies that exit via IPO tend to be younger than firms that exited by SBO or trade sale.

Descriptive Statistics by PE Firm location

Upon analysing Table 7, it can be concluded that North American private equity firms sell their portfolio companies for a higher deal value than European firms. This result was expected as M&A transactions tend to be more valuable in North America than in Europe. Additionally, PE firms in North America tend to be more experienced and have a higher AUM than European ones. Also, portfolio companies of North American firms tend to be more mature and have more employees than portfolio companies of European private equity firms.

Descriptive Statistics by PE firm type

The results presented in Table 8 lead to several noteworthy conclusions. First, the deal value of PE firm's exits tends to be bigger than VC deal value, while the time to exit tends to be shorter for PE firms compared to VC firms. Second, PE firms are more experienced and have higher amounts of AUM than VC firms. Third, portfolio companies of PE firms tend to be more mature and have more employees than VC firms. These results were expected when considering the differences in the companies targeted by PE firms and VC firms and the size differences of the deals involving these firms.

Table 6 – Descriptive statistics by exit type

Table 6 shows the descriptive statistics (Mean, Median, Minimum and Maximum) by exit type for the following variables: Deal Value, Years to Exit, Firm Age, Firm Size, Target Age, Target Size and MSCI Return.

	SBOs					Trade Sale					IPOs				
	Obs	Mean	Median	Min	Max	Obs	Mean	Median	Min	Max	Obs	Mean	Median	Min	Max
Deal Value (\$ million)	90	1,305.67	566.98	9	1,700	58	1,070.83	401.96	6.27	18,500	37	376.1	132.09	27.06	3,405.27
Years to Exit (y)	90	5.09	4	1	12	58	5.22	4	1	14	37	5.41	5	1	17
Firm Age (y)	90	28.31	25	0	138	58	21.69	20	1	96	37	25.57	22	0	148
AUM (\$ million)	90	12,572.34	4,000	75	170,960	58	26,162.6	2,500	38	366,600	37	12,269.76	1,500	30	170,960
Target Age (y)	90	25.47	18.5	0	145	58	32.02	17	0	159	37	20.59	11	0	100
Number of employees (u)	90	1,871.22	715.5	3	18,900	58	861.79	207	5	7,166	37	10,532.08	429	12	270,000
MSCI Return (%)	90	9.40	7.51	-18.14	39.49	58	8.82	7.51	-18.14	39.49	37	7.44	7.51	-11.39	27.43

Table 7 – Descriptive statistics by PE Firm Location

Table 7 shows the descriptive statistics (Mean, Median, Minimum and Maximum) by PE Firm Location for the following variables: Deal Value, Years to Exit, Firm Age, Firm Size, Target Age, Target Size and MSCI Return.

	North American Firm					European Firm				
	Obs	Mean	Median	Min	Max	Obs	Mean	Median	Min	Max
Deal Value (\$ million)	104	1,381.01	571.24	9	18,500	81	616.16	223.79	6.27	8,500
Years to Exit (y)	104	5.25	4	1	17	81	5.12	4	1	14
Firm Age (y)	104	25.64	25	0	96	81	25.74	20	1	148
AUM (\$ million)	104	261,48.97	4,650	30	366,600	81	4,733.7	1,500	38	43,000
Target Age (y)	104	28.18	18.5	0	159	81	24.44	16	1	145
Number of employees (u)	104	4,419.45	542	5	270,000	81	1,832.82	429	3	30,570
MSCI Return (%)	104	9.15	7.51	-18.14	39.49	81	8.41	7.51	-18.14	39.49

Table 8 – Descriptive statistics by PE Firm Type

Table 8 shows the descriptive statistics (Mean, Median, Minimum and Maximum) by PE Firm Type for the following variables: Deal Value, Years to Exit, Firm Age, Firm Size, Target Age, Target Size and MSCI Return.

	Private Equity Firm					Venture Capital Firm				
	Obs	Mean	Median	Min	Max	Obs	Mean	Median	Min	Max
Deal Value (\$ million)	153	1,038.72	403.92	6.27	17.000	32	1,081.56	227.75	34.88	18,500
Years to Exit (y)	153	5.05	4	1	17	32	5.88	5	1	14
Firm Age (y)	153	26.11	23	0	138	32	23.63	17	0	148
AUM (\$ million)	153	199,22.97	4,500	75	366.600	32	1,709.66	854	30	8,400
Target Age (y)	153	30.73	20	0	159	32	6.53	4	0	52
Number of employees (u)	153	3,943.67	800	3	270.000	32	146.84	44	5	1695
MSCI Return (%)	153	7.63	7.51	-18.14	39.49	32	14.57	16.48	-18.14	39.49

4. The Effects of the Specialization of Private Equity Firms on their Exit Strategy

4.1. Multinomial Logit Model

The results obtained in the multinomial logit model¹⁰ can be observed in Table 9. In this model, Secondary Buyouts were the base outcome.

Table 9 – Multinomial Logit Model Results

Table 9 shows the results obtained from multinomial logit regression model.

Base Outcome: SBO	Trade Sale Outcome 1	IPO Outcome 2
PE variables		
North American Firm	0.573 (0.509)	0.022 (0.572)
Industry Specialization	-0.894* (0.533)	-0.825 (0.610)
PE Firm	-4.418*** (1.132)	-3.559*** (1.265)
Firm Age	-0.574* (0.309)	-0.246 (0.370)
Firm Size	0.019 (0.174)	-0.137 (0.186)
Captive PE	-1.068 (1.500)	-18.947 (5,642.309)
Syndication	-0.117 (0.557)	1.324** (0.568)
Co-investment	19.484 (3,219.415)	19.011 (3,219.415)
Cross-border	0.8657* (0.491)	0.210 (0.549)
Target variables		
Target Age	0.358 (0.272)	-0.658** (0.323)
Target Size	-0.151 (0.149)	0.571*** (0.186)
Target High-tech	-1.252* (0.683)	-2.253*** (0.784)
Market Conditions		
MSCI return	-1.120 (1.410)	-3.827* (2.252)
Brexit	0.236 (0.671)	0.698 (0.758)
Covid-19	1.145 (0.722)	0.142 (0.984)
Russia Ukraine War	0.283 (0.716)	-17.238 (2,436.942)
Observations	185	
LR Chi ²	110,49***	
Pseudo R2	0,2991	

¹⁰ Variables are defined in Table 9. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% level, respectively. Standard errors are reported under the coefficients in parenthesis.

According to the estimations obtained in Table 9, industry-specialized firms, both PE and VC firms, are more likely to exit via SBO than trade sales. This result contradicts previous research, where industry-specialized PE firms were likelier to exit via trade sale than through an SBO (Rigamonti, et al., 2016).

Moreover, these estimations suggest that SBOs are the preferred exit route for late-stage private equity and more experienced firms.

On the other hand, IPOs are more likely to be used by syndicated deals, while cross-border deals are more likely to be exited via trade sale when compared to an SBO.

Regarding the characteristics of the portfolio firms, younger target but larger firms were more likely to exit via IPO than through an SBO. This can be explained by the presence in our sample of fast-growing companies. However, our results suggest that high-tech industries are also divested through SBO rather than trade sales and IPOs.

Finally, firms were less likely to exit via IPO in years where the previous year's MSCI return was high, indicating that firms preferred to exit via IPO in years where the market was booming and generating huge returns, consistent with an existence of a "window of opportunities" for IPOs.

4.2. Hazard Model

The results obtained in the Cox proportional hazards model can be observed in Table 10¹¹. The estimations presented are for the entire sample, for SBO exits, trade sale exits, and IPO exits, respectively.

Table 10 – Hazard Model Results

Table 10 shows the results obtained from the Cox proportional hazards model.

	Full Sample	SBO	Trade Sale	IPO
PE variables				
NA Firm	0.008 (0.190)	0.119 (0.318)	-0.015 (0.398)	-0.129 (0.605)
Industry Specialization	0.319* (0.194)	0.451 (0.296)	0.267 (0.368)	0.659 (0.805)
PE Firm	0.377 (0.353)	2.422*** (0.910)	0.127 (0.568)	0.480 (0.897)
Firm Age	0.055 (0.118)	0.116 (0.199)	0.109 (0.220)	-0.092 (0.372)
Firm Size	0.084 (0.063)	0.078 (0.113)	0.084 (0.107)	0.148 (0.151)
Captive PE	0.443 (0.527)	0.111 (0.637)	4.540*** (1.492)	0 (omitted)
Syndication	-0.204 (0.195)	0.047 (0.315)	-0.057 (0.388)	-0.192 (0.671)
Co-investment	0.125 (0.351)	0 (omitted)	0.180 (0.483)	0.045 (1.057)
Cross-border	-0.143 (0.173)	-0.199 (0.292)	-0.127 (0.330)	-0.284 (0.406)
Target variables				
Target Age	0.114 (0.097)	-0.212 (0.169)	0.279* (0.165)	-0.137 (0.307)
Target Size	-0.127** (0.054)	-0.116 (0.086)	-0.150 (0.135)	-0.154 (0.134)
Target High-tech	0.076 (0.230)	0.348 (0.296)	-0.220 (0.566)	-0.355 (0.751)
Market Conditions				
MSCI return	-0.885 (0.557)	-1.926** (0.900)	0.215 (0.927)	-2.735 (1.965)
Brexit	0.117 (0.246)	0.057 (0.414)	0.125 (0.521)	0.370 (0.706)
Covid-19	0.008 (0.275)	0.501 (0.465)	-0.305 (0.582)	-0.058 (0.973)
Russia Ukraine War	-0.017 (0.303)	-0.228 (0.454)	0.201 (0.460)	0 (omitted)

¹¹ Variables are defined in Table 10. ***, ** and * indicate that the coefficient is significant at the 1%, 5% and 10% level, respectively. Standard errors are reported under the coefficients in parenthesis.

According to the results obtained in Table 10, exits tend to occur sooner when the firm is specialized in specific industries. Contrarily, portfolio companies tend to be divested later when they are smaller. This may be because smaller companies tend to be invested by VC firms, which generally require higher holding periods than late-stage PE firms.

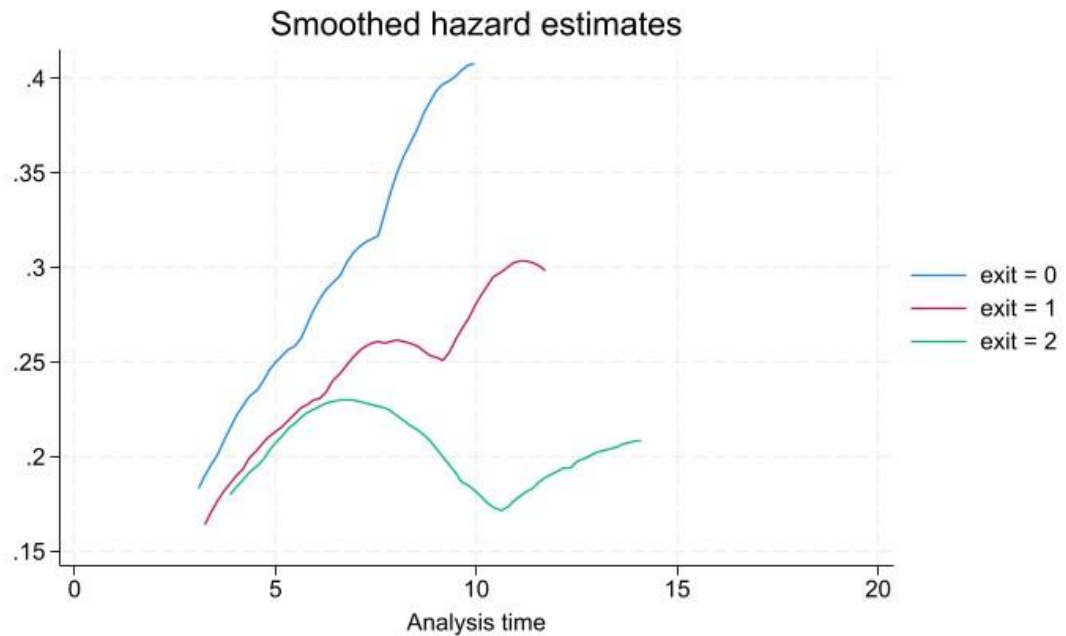
Looking only for SBO exits, our results suggest that a late-stage PE firm is likelier to exit sooner than a VC firm. Moreover, when the MSCI return in the year before exit is high, the exit tends to occur later. This may be due to the positive correlation between stock market booms and M&A deal values and the fact that a booming stock market generates a “window of opportunity” for IPOs.

Regarding trade sale exits, these are more likely to occur sooner when the PE firm is bank, insurance or government-affiliated. Additionally, exits by trade sales tend to occur sooner when the portfolio company is more mature. This occurs as, usually, younger portfolio companies need more help from firms, particularly start-ups invested by VC firms, which tends to prolong the holding period of the companies.

In conclusion, specialization does play an important role in the exit strategy as it allows firms to exit from their portfolio companies sooner, which is vital to maintaining good fund performance figures, i.e. internal rate of return (IRR). Also, when exiting via SBO, late-stage firms can exit quicker than VC firms, a result that was expected given the larger holding period of VC portfolio companies. For trade sales, the maturity of the portfolio company mattered when it came to the time of exit, as firms could exit quicker from more mature firms.

Figure 2 shows the hazard functions for each exit route and provides some interesting evidence on the dynamics of the exit process.

Figure 2 – Hazard Model Graph



Firstly, the exit probabilities are much higher for SBOs in the first ten years. Secondly, after the 10-year mark, exits via SBO disappear, with the most likely exit route after that being a trade sale. Thirdly, IPO tends to be the less likely exit route but the only one available past the 12-year mark.

Analysing each exit route individually, the probability of exit via SBO increases over the years of the holding period. The exit is more likely around the 10-year mark, with no exit via SBO occurring after that.

In the case of trade sales, the exit probability increases until the 8-year mark, which is then followed by a slight decrease. However, the exit via trade sale is more likely around the 12-year mark, as the trade sale becomes the alternative to the SBO after the 10-year mark.

Lastly, the probability of exit via IPO is more likely in the 6-year mark. However, around the 11-year mark, the probability increases since, according to our sample, it is the only option available.

5. Conclusions

The present dissertation aims to study the effects of industry and stage specialization on exit strategy in North America and Europe. Moreover, it strives to study how the preferred exit route affects the time to exit PE firms from their portfolio companies.

A sample of 185 private equity exit transactions from 2016 to 2023, contemplating 185 target companies and 148 private equity firms, was compiled. A first analysis of the descriptive statistics showed that most deals were exited by secondary buyout, trade sale, and, finally, by initial public offering.

The results of the multinomial logit model suggest that industry-specialized firms were more likely to exit via SBO, whilst non-industry specialized firms were more prone to exit via trade sale, contrary to the results of previous research (Rigamonti, et al., 2016). Moreover, the results showed that a later-stage private equity firm tended to exit via an SBO rather than through trade sale and IPO, suggesting that SBOs were the preferred exit route for this type of firm. In the case of VC firms, these tended to exit via a trade sale and IPO rather than an SBO. In addition, more experienced PE/VC firms tended to divest via SBOs rather than trade sales. On the other hand, syndicated deals tended to be exited via IPO rather than through an SBO, and cross-border deals are more likely to be exited via trade sale than through an SBO.

Regarding the characteristics of the portfolio firms, younger but larger firms were more likely to exit via an IPO than through an SBO. Furthermore, firms in high-tech industries tend to be divested through an SBO rather than trade sale and IPO. Finally, firms were less likely to exit via IPO in years where the previous year's MSCI return was high.

Analysing the Cox proportional hazards model results for the entire sample, it can be concluded that exits tended to occur sooner when the firm specialized in specific industries. Contrarily, when the company is smaller, tend to be divested later. The coefficient estimations for only SBO exits evidenced that a PE firm was more likely to exit sooner if it was a later-stage PE firm. Moreover, when the MSCI return in the year before exit was high, the exit tended to occur later.

Regarding trade sale exits, these were more likely to occur sooner when the private equity firm was bank, insurance or government-affiliated. Additionally, exits by trade sales tended to occur sooner when the portfolio company was more mature.

Moreover, the exit probability of an SBO was highest around the 10-year mark, whilst for a trade sale and IPO, it was around the 11-year and 6-year mark, respectively. Additionally, the IPO was found to be the exit of last resort after the 12-year mark.

Ultimately, the results point to the SBO being the preferred exit strategy for later-stage PE firms, as this was the exit route that allowed firms to exit sooner from their portfolio companies. At the same time, VC firms preferred to exit via trade sale, which led to a longer holding period for the portfolio companies. Additionally, industry-specialized firms preferred to exit via SBO, whilst non-industry-specialized firms preferred to exit via trade sale.

Naturally, this study faced multiple limitations, such as the limited sample size and the exclusion of potentially suitable deals due to information limitations. Further research could be pursued in any of the following topics: (1) study the relationship between the return of private equity and venture capital transactions and the exit route used; (2) study the relationship between the time to exit of private equity and venture capital transactions and the returns of those transactions; (3) increase the sample size by including a broader period and more private equity and venture capital transactions from different geographical areas.

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Annexes

Orbis M&A

Orbis M&A is a database commercialised by *Bureau van Dijk* for corporate finance research, with information on M&A, IPO, private equity and venture capital deals and rumours. It is updated hourly and contains information on more than 300,000 thousand deals involving North American and European acquirers, targets, or vendors, as early as 2010. Hence, despite the potential bias due to missing or incorrect information, *Orbis M&A* was deemed a well-suited database to conduct the sample selection, as described in section 3.2.