
DETERMINANTS OF VENTURE CAPITAL EXITS IN EUROPE

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Internship report
Master in Finance

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2022

Acknowledgments

I would like to start by thanking my parents for supporting me in everything – even at the times you did not agree with some of my choices. I recognize I am extremely privileged for having parents that provided me with the opportunities they never had growing up and which they hoped had access to. I hope you are proud of me, just as much as I am proud of you.

I would also like to thank Professor Miguel Sousa for all of his help and understanding during the supervision of this report.

I want to thank Inter-Risco for having granted me the opportunity to do a very enriching internship, and for the more casual moments. Especially I want to thank José Leite, Paulo Ribeiro and Isabel Martins who helped me a lot during the internship – whether it being with feedback and my tasks, or with career advice and schedule flexibility.

I would like to give a special thank you to Professor Vítor Ribeiro who helped me a lot when I needed extra guidance, even though we had not previously met.

Lastly but certainly not least, thank you to all my friends and to my brother who have also supported me and with whom I shared unforgettable moments.

Abstract

This report aims to examine the determinants that lead a venture to exit through a specific exit route. By using a sample of 330 Venture Capital exit deals from a time period of 15 years, the report analyzed several determinants that could affect the exit choice of Venture Capitalists, focusing on the exit routes of IPO, Trade Sale, and Secondary Sale. For this analysis it was used a multinomial logistic model which was improved through several rounds of statistical tests, and it included variables related to the characteristics of the entrepreneurial firm, of the VC firm, and market conditions. The results reveal that the syndicate size is a relevant factor in the choice of exit, impacting positively the probability of an IPO or Trade Sale, and negatively a Secondary Sale. Other factors that seem relevant are stock market returns and tightening of debt markets for the exits of IPO and Secondary Sales. Higher stock returns are associated with a higher probability of IPOs and lower probability of Secondary Sales. Whilst more tightened debt markets have a higher probability of a Secondary Sale and a lower probability of an IPO. The report also showcases the impact of the target's region and industry. It was also concluded that the syndicate's firm experience, regional proximity between the syndicate and the target, and the investment amount do not affect the exit choice.

Key words: Venture Capital, Exit.

JEL-codes: G24, G11.

Resumo

Este relatório tem como objetivo examinar os determinantes que levam um fundo de venture capital a escolher a saída específica de cada empresa em que investiram. Ao usar uma amostra de 330 saídas de *Venture Capital* de um período de tempo de 15 anos, o relatório analisou vários determinantes que poderiam afetar a escolha de saída por parte de *Venture Capitalists*, focando-se nas saídas *IPO*, *Trade Sale*, e *Secondary Sale*. Para esta análise foi usado um modelo logístico multinominal que foi melhorado através de várias rondas de testes estatísticos, e que inclui variáveis relativas às características da empresa *target*, da empresa de *Venture Capital*, e de condições de mercado. Os resultados revelam que o tamanho do sindicato é significativo para todas as saídas. Outros fatores que aparentam ser relevantes para as saídas de *IPO* e *Secondary Sales* são os retornos do mercado de ações e a constrição do mercado de dívidas. Maiores retornos do mercado de ações resultam numa maior probabilidade de *IPOs* e menor de *Secondary Sales*. Enquanto mercados de dívida mais contraídos resultam numa maior probabilidade de saídas por *Secondary Sales* e menor por *IPOs*. O relatório também descreve o impacto da região e indústria da empresa *target*. Foi também concluído que a experiência do sindicato, a proximidade regional do sindicato com a empresa *target*, e a quantidade de investimento não afetam a escolha de saída.

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1. Introduction

This report was developed based on a five-month curricular internship at Inter-Risco Private Equity. Inter-Risco is a reference PE firm operating in the Portuguese market since 1988. The main objective of the internship was to provide an investment recommendation that would be considered for ESG purposes.

As a result of this experience, I had the possibility to better understand how the Private Equity industry works. One of the things I have learned is that exiting is an important part of the venture capital business. As a result, the identification of expected exit possibilities prior to the investment in new ventures is of paramount importance (Giot & Schwienbacher, 2007; Schwienbacher, 2005).

The exit can be determined not only regarding its timing, but also vehicle. Considering that there is plenty of literature referring to the timing of exit, this internship report aims to determine what are the factors that make each exit route more likely in Venture Capital, specifically in Europe. This information, allied with knowing what the most profitable exit routes are, can help investors to choose more adequately their Venture Capital targets and strategy.

The internship report will analyze three possible exit routes – IPOs, trade sales, and secondary sales – and it will use a sample of European VC-backed firms (defined as firms with less than 15 years at the time of the investment) exited from 2007 to 2021. A multinomial model will be used to obtain the test the main hypotheses.

The first section of the report will focus on making an overview on the internship that inspired this research. Not only will it explain the activities carried out, but it will also provide some context on the firm. Followingly, it will be analyzed what is the state of literature regarding the venture capital industry (including in Europe), and the exits. The next section focuses on the methodology and research question, where it will be analyzed the possible explanation variables for the predictive model as well as the best type of model to use. Afterwards, the report will proceed with explaining the process of data construction and analyze it with descriptive statistics and tests. Finally, the report will estimate the model which should answer the research question and draw some conclusions on the results achieved.

2. Curricular Internship Overview

One of the main motivations for the research question of this report was the five-month curricular internship carried out at the Private Equity firm Inter-Risco. This section is therefore aimed at presenting the activities performed in this internship and explaining how these inspired me to conduct this specific research.

2.1. The firm Inter-Risco

Inter-Risco is a Private Equity firm of reference in this industry in Portugal headquartered in Porto. It was founded in 1988 by Banco Português de Investimento (BPI) in partnership with 3i, IFC, Credit Lyonnais among other institutional investors, becoming the first private PE operator in Portugal. Currently, its major and only stakeholder is BPI. The firm manages around 130€ Million of assets (presented in figure 1) which include the investment funds “Inter-Risco I Caravela”, “Inter-Risco II”, and “Inter-Risco II CI”.

The PE firm has a particular strategy when carrying out its activities. It pursues a generalist approach when selecting the sector of investment, concentrating in fragmented, regulated, or growth markets, with the aim of creating leading players in its respective industries. Additionally, it focuses on traditional industries with liquid M&A markets, to ensure a successful exit strategy and mitigate the overall investment risk. The main target are small and medium Iberian enterprises.

Following the due diligence and acquisition, Inter-Risco follows in most of its projects buy-and-build, sectorial consolidation, and expansion strategies through internationalization. The firm adds value through its hands-on approach on a strategic and operational level. Key areas of intervention include strategic planning and implementation, professionalization and post-deal integration, business plan execution, networking and deal-flow opportunities, and operational upgrade.¹

¹ Source: [Inter-Risco](#)

Figure 1

Inter-Risco Current Portfolio Companies

			
Industry: Coffee Roasting	Industry: Veterinary	Industry: Hotel	Industry: Engineering
Year: 2007	Year: 2012	Year: 2013	Year: 2013
Type: Buyout	Type: Build-up	Type: Build-up	Type: Buyout
Stake: 22%	Stake: 99,6%	Stake: 100%	Stake: 51%
Country: Portugal	Country: Portugal	Country: Portugal	Country: Portugal
			
Industry: Waste Energy	Industry: Glass Repairs and Substitution	Industry: Production and Commercialization of scaffolding	
Year: 2013	Year: 2016	Year: 2016	
Type: Buyout	Type: Buyout	Type: Expansion	
Stake: 66,3%	Stake: 90%	Stake: 40,74%	
Country: Portugal	Country: Portugal	Country: Portugal	

2.2. Activities Performed During the Internship

The curricular internship was carried out at the Investment Management department of the Private Equity firm Inter-Risco, with the main objective being to provide the firm an investment recommendation that would be considered for ESG purposes.

As such, the project started by making market research to define the state and legislation of ESG investments in general financial markets. Followingly, it was also analyzed how Private Equity firms incorporated ESG factors in their portfolios. The following task was to choose some targets, which was done with the usage of the Sabi database and ensuring these are ESG conformant and financially attractive for a Private Equity investment.

As the recommendation consisted of a Private Equity investment, companies in seed stages (which would be classified as a Venture Capital investment) were not considered. Knowing that VC investments are riskier than PE ones, it sparked some interest as to how returns are realized in Venture Capital and what are their determinants. Hence, understanding what are the determinants that lead VC a portfolio company to exit through each type of exit is a key issue for the financial literature on PE and VC.

Consequently, the main objective of this study is to understand what are the determinants that lead target firms to exit through a specific exit route.

The following section includes a theoretical framework that duly justifies the pertinence of the performed research, through an adequate review of the literature.

3. Literature Review

The purpose of this section is to understand what the state of the literature regarding Venture Capital is, and of Venture Capital exits. More specifically, it will be analyzed literature on what is Venture Capital and its relation to Private Equity, how venture capital investments tend to be conducted and the relationships raised from this activity, how the venture capital market in Europe compares to its US American counterpart, and an overview of the possible exits.

3.1. Introduction to Venture Capital

3.1.1. Definition of Venture Capital and relation with Private Equity

Venture Capital (VC) has been defined many times throughout the literature. Sahlman (1990) has defined it as “a professionally managed pool of capital that is invested in equity-linked securities of private ventures at various stages in their development” (Sahlman, 1990). In the case of Eurostat Statistics Explained, its Glossary ², defines VC as a “subset of private equity and refers to equity investment made for launch (seed), early development (start-up), or expansion (later stage venture) of businesses”.

Private Equity on the other hand refers to a broader term which is defined by the Statistics Explained Glossary as follows: “an equity capital provided to enterprises not quoted on the stock market. Private equity includes the following investment stages: venture capital, growth capital, rescue/turnaround, replacement capital, and buyouts.” Therefore, the difference between Private Equity and Venture Capital comes down to the stage of development of the enterprise being invested in and therefore its risk (Barry et al., 1990).

² Statistics Explained is an official Eurostat website presenting statistical topics in an easily understandable way. The Statistics Explained Glossary covers all statistical and general terms in Statistics Explained in need of a definition or explanation. The link for the Glossary page is: [Category:Glossary - Statistics Explained \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)

3.1.2. What Venture Capital Does

This section aims to describe how Venture Capital works. Not just its process, but also the relationships between the different parts involved (mainly the relationship between investors and venture capitalists, and between venture-capital firms and the companies in which they invest).

The venture capital industry is associated with uncertainty and information asymmetries between principals and agents (Gompers & Lerner, 1999; Gompers & Lerner, 2001; Sahlman, 1990), and as such investing in a private equity or venture capital fund “is a leap of faith for institutional investors” (Gompers & Lerner, 2004). Hence the structure and governance of VC firms are designed in a way to address these issues which will be discussed in greater detail in this section.

The venture capital process works as a cycle. It starts with fund raising, proceeding with investment, monitoring of, and adding of value to the enterprises. This process continues until the exit, which then leads to venture capitalists raising of additional funds (likely to another project) (Gompers & Lerner, 2001).

As previously stated, the VC process starts with fundraising, which typically comes from VC funds, who therefore act as financial intermediaries (Metrick et al., 2010). Entrepreneurs must recur to this channel because, due to their uncertain and high-risk nature, start-ups are unlikely to receive debt financing, or if so at very high interest rates (Gompers & Lerner, 1999; Zider, 1998). This injection of capital happens in rounds for investors to reduce their risk (Sahlman, 1990). For this same reason, it can also happen that VC firms coinvest in the same venture with one leading (Zider, 1998). VC funds purchase their equity or equity-linked stakes while the firms are still privately held (Gompers & Lerner, 2001).

VC funds or firms usually follow the corporate model of limited partnerships. The fund managers (called General Partners) typically are active investors and invest through syndicates in which one or more take the lead role with working with the portfolio firm (Barry et al., 1990). The investors of these funds (usually institutional investors or wealthy individuals (Zider, 1998)) are called Limited Partners and provide capital at the fund inception and whenever there is a call from the GPs for additional rounds (Guler, 2007; Phalippou et al., 2009; Sahlman, 1990).

The stage of fundraising is followed by the management of the venture, which is carried out by the GPs, who “monitor the venture’s progress and provide resources and advice to help the venture progress toward a successful exit” (Guler, 2007). This active monitoring allows not only for the management of uncertainty, but also for addition of value to the venture by the GPs (which is achieved with guidance, contracts, know-how, support of the backers, and access to consultants, investment bankers and lawyers) (Gompers & Lerner, 1999; Guler, 2007). The GPs are compensated with a management fee, and a percentage of the profits over the life of each fund (Guler, 2007; Sahlman, 1990). Once the investments of the fund start to yield cash or marketable securities, these are distributed to the Limited Partners (Phalippou et al., 2009; Sahlman, 1990) according to the partnership agreement – the agreement which spells out the rights and obligations of both the outside investors who supply their funds and the entrepreneurial ventures in which they invest (Metrick et al., 2010; Sahlman, 1990).

It is in this phase of the VC process that the relations between the different groups are materialized.

Venture capitalists act as agents for the limited partners and can act as GPs who manage the ventures in which they invest and retain important control rights to do this (Gompers & Lerner, 1999; Zider, 1998). Nevertheless, LPs remain the right to vote on key issues such as amendment of the limited partnership agreement, dissolution of the partnership before the termination date, extension of the fund’s life, removal of any general partner, and valuation of the portfolio. Because of this relationship and the existence of information asymmetry, there can be a conflict of interest between GPs and LPs. These are addressed by a series of covenants and restrictions in the limited partnership, as well as by staged capital infusion, and equity compensation (Gompers & Lerner, 2001; Sahlman, 1990).

Throughout the life of the VC cycle, there is another relationship that is materialized after fundraising: the one between the VC firm/ Venture Capitalists and the venture. The stock-purchase agreement (which is the “basic document that governs the relationship between the venture-capital firm and the venture is the stock-purchase agreement” (Sahlman, 1990)) is necessary as it is difficult to monitor the progress of a venture after its funding, and the probability of it failing is relatively high. There is also the fact that at times the venture capitalists and the entrepreneurs have different information. Due to these issues, venture

capitalists structure their investments, devise the compensation schemes that provide venture managers with appropriate incentives, become actively involved, and preserve mechanisms to make their investments liquid (Sahlman, 1990).

VC funds usually dissolve after ten or twelve years (Gompers & Lerner, 2004; Metrick et al., 2010; Phalippou et al., 2009) because they are designed to be “self-liquidating”, which forces some discipline as it forces investors to make the exit. Although it is said the main reason to set a limited duration to the funds is to provide LPs with liquidity (as the exit is their only way to make a return on the investment (Schwienbacher, 2009)) Guler (2007) defends “it also forces VC firms to exit investments at the end of a fund’s life”.

The overall deal structure for VC investments is complex, and its rationale is to give investors protection and a favorable position for additional investment if the company is doing well (Zider, 1998).

3.2. Venture Capital in Europe

3.2.1. Venture Capital in Europe and differences compared to the US counterpart

“Europe is one of the regions in the world in which VC is most developed” (Bertoni et al., 2015). However, contrary to the case in the United States of America, Venture Capital is a less developed and less mature market in Europe (Hege et al., 2003; Martin et al., 2002). As a matter of fact, the European Venture Capital industry only took “hold in the late 1990s, with investments reaching 12 billion dollars in 1999, roughly a quarter of the US level” (Hege et al., 2008). The VC market also seems to be concentrated in certain regions, especially the US (Cumming et al., 2017; Groh et al., 2010). Additionally, Bottazzi and Da Rin (2002) find that the “wedge between them to be large and growing” (Bottazzi & Da Rin, 2002).

However, the impact of European Venture Capital is still limited in its “effect on their ability to raise equity capital, grow, and create jobs” (Bottazzi & Da Rin, 2002). Indeed, even the Euronext stock market’s innovative firms – where the European VC industry has a big impact (Geronikolaou & Papachristou, 2012) –, “do not grow and create jobs faster than non-venture-backed companies” which can be due to the immaturity of European VC (Bottazzi & Da Rin, 2002).

Geronikolaou and Papachristou (2012) also state that, in Europe, innovation creates a demand for VC instead of VC being a supplier of. From this, it can be inferred that there might be a lack of VC funds or venture capital supply in Europe, constraining the industry's growth and determining its equilibrium. The authors explain this might be due to information asymmetry issues and "irreversibility considerations of VC investments".

The European VC industry appears to have a lesser vitality than the US counterpart (Black & Gilson, 1998). US Venture Capital appears to have, not only a faster exit, but also a more common practice of exit through IPOs compared to the European VC, as the first possess a more liquid and attractive market for most VC exits (Black & Gilson, 1998; Hege et al., 2008). This lower performance in terms of type of exit in the European VC market, also extends to rates of return (Black & Gilson, 1998). These differences are amplified when comparing well-established (older) European VC firms and younger US ones (Schwienbacher, 2005).

3.2.2. Explanations for the differences

Differences in legal, fiscal, and regulatory infrastructures also take a toll on the growth of VC market. Europe is characterized by heavy regulation and higher taxation, stifling the demand and supply of VC (Gompers et al., 1998; Martin et al., 2002).

Other determinants stalling the growth of the European VC market are investor protection, corporate governance, human and social environment, and entrepreneurial culture (Groh et al., 2010). The US tends to display better scores on these parameters, whilst Europe presents a lot of diversity on them in each country. (Groh et al., 2010)

In the legal realm, Porta et al. (1998) found interesting results that can explain some of the heterogeneity within Europe regarding the protection of corporate shareholders and investors. Common-law countries appear to generally have the strongest protection, and French civil law countries the weakest legal protections of investors, with German-and Scandinavian-civil-law countries being the middle ground. In respect to law enforcement, the ones with best quality were the German-civil-law and Scandinavian countries, followed by common-law and French-civil law countries (La Porta et al., 1998). In another study, these

authors have found that countries with poorer investor protections tend to “have smaller and narrower capital markets” (both equity and debt), leading to conclude that these factors also explain the small growth of VC in Europe (La Porta et al., 1997).

The performance gaps between the US and European VC markets can be partly attributed to contractual arrangements between entrepreneurs and venture capital providers (in the US venture capitalists assert more contingent control rights – using more convertible securities –, appear to have a better capacity to screen projects, and to ensure their success in early stages) (Black & Gilson, 1998; Hege et al., 2003).

The less sophistication of European Venture Capitalists can also explain some of the returns’ discrepancies, as these tend to use instruments of control and contingent funding less efficiently (unlike in the US, Europeans VCs do not react with further funding when confronted with good performance), use syndication less and less efficiently (as their syndication does not grow overtime), monitor less, replace less former management, include less specialized VCs, and less corporate investors (Hege et al., 2008; Schwienbacher, 2005).

Venture Capital is extremely sensitive to developments in capital markets (Black & Gilson, 1998; Martin et al., 2002), as higher volumes of IPOs and trade sales accelerate and improve exits for VC investors (Giot & Schwienbacher, 2007). The state of the capital market is a proxy for the professionalism of the financial community, for deal flow and exit opportunities (Groh et al., 2010). However, Europe tends to present a more bank-centered market (opposite of a stock-centered market such as the US), and fragmented stock markets, leading to a reduction of the exit performance and vitality of the market (Black & Gilson, 1998; Martin et al., 2002).

3.2.3. How these differences have been addressed

Currently, the UK represents by far the largest venture capital market in Europe (Groh et al., 2010; Martin et al., 2002). The reason for the big gap is partly due to its investor protection and corporate governance rules, and the size and liquidity of its capital market (Groh et al., 2010). According to a ranking made by Groh et al. (2010), the following most attractive European countries for VC are Ireland, Denmark, Sweden, and Norway (Groh et al., 2010).

To reduce these differences (both between the different countries and the US and European VC), the European Commission considers it is necessary to substantially develop the risk of the capital market (Martin et al., 2002).

In 1998 the European Commission put this idea into practice with policy initiatives – the Risk Capital Action Plan. This plan was directed towards various playing-level fields, there were measures aimed at increasing stock market openness and/or labor market flexibility, tax incentives, among others to stimulate both the supply and the demand side of the VC market (Cumming et al., 2017).

These 1998's efforts have also led to the emergence of a peculiar feature in the EU context: a higher presence of governmental VC (Cumming et al., 2017). However, studies indicate that these specific types of VC funds' impact is negligible, and that, on average, private independent VC-backed companies have better exit performance than government-backed companies (Cumming et al., 2017).

3.3. Venture Capital Exits

The exit is the last stage of involvement by the Venture Capitalists in the venture. This is a crucial phase as it the primary way for venture capitalists to turn their illiquid stakes in the company into realized return and obtain a positive return on their investment (Bayar & Chemmanur, 2011; Gompers & Lerner, 2001; Schwienbacher, 2005, 2009).

Considering the importance of this stage for the Venture Capitalists' returns, the exit can be considered as important as the entry decision itself (Schwienbacher, 2009). Because of this, the identification of expected exit possibilities is an important part of the due diligence process that venture capitalists go through before they decide to enter (Schwienbacher, 2005, 2009).

The exit can be materialized in several ways, including Initial Public Offerings (IPOs), trade sales, stock buybacks, secondary sales, or even liquidation (Cummings & MacIntosh, 2003). The highest rates of return usually happen when the Venture goes public (especially for which a developed stock market is vital) or is bought at a high price (Black & Gilson, 1998; Cummings & MacIntosh, 2003; Guler, 2007; Schwienbacher, 2005).

However, it should be noted that one of the main determinants of the quality of an entrepreneurial exit is the information asymmetry. To maximize the returns in an exit, a Venture Capitalist will choose the exit route for which the new owners are best able to resolve information asymmetry. This is because with lower informational asymmetries, investors will be more willing to pay more for the venture firm (Barry et al., 1990; Cummings & MacIntosh, 2003).

Exits can also be distinguished between full and partial. While a full exit (applicable for all exit types) occurs when Venture Capitalists or entrepreneurs sell all their equity in the venture, a partial exit occurs when these retain some of their respective interests. Greater degrees “of information asymmetry between the selling VC and the buyer” lead to a higher likelihood of a partial exit, signaling a bigger quality of the venture (Cumming & MacIntosh, 2003).

3.3.1. IPOs

The exit through an IPO – in which the company issues shares to the public – tend to result in the highest valuation of a company. This explains why many studies find that this tends to be the preferred exit route for highly valued firms (Cummings & MacIntosh, 2003; Fenn et al., 1997; Gompers & Lerner, 2001).

This higher valuation seems to be further proved by the fact that “venture capital-backed companies are underpriced by a smaller amount than companies that are not venture-backed” (Fenn et al., 1997). This can be explained by capital markets recognizing the quality of venture-capital monitoring services, and thus requiring less underpricing from higher-quality monitors (Barry et al., 1990). This finding can also reflect a certification premium, as “reputable partnerships do not bring lemons to market” and be also a result of the value of the partnership’s ongoing management activities (Fenn et al., 1997).

IPOs are also characterized by significantly higher valuations than acquisitions, as the average valuation of firms going public tend to be greater than the average value of firms that are acquired (Bayar & Chemmanur, 2011). This finding can be explained by the fact that, unlike investors in the IPO market who have an informational disadvantage with respect to firm insiders, potential acquirers are able to value the firm better due to their industry expertise.

Additionally, acquirers tend to have considerable bargaining power which allows them to extract the firm's net present value (NPV) from insiders, while investors in the IPO market would price the firm's equity competitively (Bayar & Chemmanur, 2011).

There are many advantages for going public, the main ones were cited by Röell (1996). The first is the access to new finance from the equity markets, not only can debt overhang and other agency problems be mitigated, but also the liquidity will be increased and allow for better rates with finance suppliers. The other most important reason is the enhancement of the company's image and the publicity an IPO could bring, as a public listing can provide an initial certification by financial markets but also a longer-term price signal to suppliers, workforce, and customers. The public listing also motivates management and employees as there seems to be an improvement in their morale after such event probably driven by share participation schemes. An IPO also is used for shareholders to cash in on their investments. Finally, going public can also allow managers to exploit mispricing from the excessively optimistic investors (Röell, 1996).

Other advantages for going public result from the control Venture Capitalists and entrepreneurs can maintain after the venture goes public. The IPO, in a stock-market-centered capital market such as the US, allows the venture capitalist and the entrepreneur to contract implicitly over control – which is not easily duplicable in a bank-centered capital market such as the European (Black & Gilson, 1998). In the case of being in a stock-centered market, venture capitalists will continue to hold nearly all of their equity through the offering, and most of their investment a year later (Barry et al., 1990). This is a result of the restriction – by the Rule 144 or the underwriter – imposing the partnership from selling any or a portion of its shares in the offering for an initial period of two years (Fenn et al., 1997). As a result, Venture Capitalists also generally continue to hold their board positions for more than a year after the IPO (Barry et al., 1990; Fenn et al., 1997).

3.3.2. Trade sales

While not being the most attractive, a trade sale (or acquisition as it is more frequently referred to in the literature) appears to be the exit alternative most chosen (Barry et al., 1990; Bayar & Chemmanur, 2011).

The trade sale occurs when the entire venture is purchased by a third party and can be effected by several means including a sale of shares, a merger, and a sale of the firm's assets (Cummings & MacIntosh, 2003).

The purchaser is usually a strategic acquiror who aims to meld the target's products and/or technology with its own, to produce synergistic gains. The purchaser can either be a business similar to the target, a competitor, supplier or even a customer. It tends to be larger than the target firm (Cummings & MacIntosh, 2003). Due to this, trade sales can sometimes provide a premium for the synergies created with the acquisition (Wall & Smith, 1997).

Following the acquisition, the purchaser can make the venture its subsidiary or a separate division when it aims to preserve the management/entrepreneurial team responsible for its past success. Alternatively, it can also proceed with a merger of the two firms (Cummings & MacIntosh, 2003).

This exit route is an attractive alternative for the limited and general partners since it provides payment in cash or marketable securities and ends the partnership's involvement with the firm. However, the venture's management can see it as unwelcome as it does not allow the venture to remain independent (Fenn et al., 1997; Wall & Smith, 1997).

3.3.3. Stock buybacks

A buyback consists of the exit when the entrepreneur and/or the firm's managers or the entrepreneurial firm repurchase the ventures' shares held by the Venture Capitalist (Cummings & MacIntosh, 2003).

This exit often occurs as a result of the exercise of contractual rights taken by the Venture Capitalist at the time of initial investment. These rights include, for example, the Venture Capitalist's ability to liquidate its shares after a stated time period has passed, when the EF has failed to achieve performance targets, or when the EF has failed to go public (Cummings & MacIntosh, 2003).

As a result, buybacks tend to be considered a backup exit, and are used primarily when the investment "has been unsuccessful" (Fenn et al., 1997).

3.3.4. Secondary sale

Another type of exit is the secondary sale. In it, a Venture Capitalist – much like a trade sale – sells its shares to another Venture Capitalist (Cummings & MacIntosh, 2003).

The selling of the venture to another Venture Capitalist can be motivated by a difference in the skill sets of the two parties, where the purchaser might have better knowledge or capabilities to manage the venture. It could also be motivated by differences in the confidence felt by the two parties in the future of the firm's product or technology. (Cummings & MacIntosh, 2003)

The secondary sale differs from the acquisition exit in the sense that in this case, the purchaser – a strategic acquiror – usually seeks a window onto the firm's technology, with a view to a possible 100 per cent acquisition of the venture at some point in the future (Cummings & MacIntosh, 2003).

A secondary sale is considered to be an unattractive exit for venture capitalists since these believe “If I can't make money, how can they?”, and the exit is the third best option on price (Wall & Smith, 1997).

3.3.5. Liquidation

A liquidation (also sometimes called write-off in the literature) occurs when a Venture Capitalist walks away from its investment. While it usually involves the failure of the company, the write-off might be associated with the VC continuing to hold shares in the venture (using it as returns) (Cummings & MacIntosh, 2003).

This type of exit is most common for ventures that are less valuable (Cummings & MacIntosh, 2003).

4. Research Question and Methodology

This section is aimed at developing the research question of what determines the different venture capital exits. Additionally, this section will be aimed at describing the methodology. For this report, only the most important exit routes will be considered: IPO, trade sale and secondary sale.

The development of the research question was done by evaluating the literature on the topic of factors that might affect the exit route of the VC firm, which will be used as explanatory variables for the predictive model. In result, the report will study determinants of exit probability. The determinants are firstly related to the VC firm, secondly to the portfolio company, and finally regarding the impact of regional effects relating to the country of origin of the portfolio company.

Additionally, it will be described what type of model will be used to answer the research question of what determines the probability of each exit route.

4.1. Type of regression used to answer the Research Question

The model for answering the research question will be of the following equation:

$$\begin{aligned} & \textit{Probability of an exit route occurring over an IPO}_i \\ &= \alpha_i + \beta_1 \textit{SYNDSIZE}_i + \beta_2 \textit{VCEXPERIENCE}_i + \beta_3 \textit{REGPROX}_i \\ &+ \beta_4 \textit{INVESTMENT}_i + \beta_5 \textit{REGION OF TARGET}_i \\ &+ \beta_6 \textit{EURONEXTRETURN}_i + \beta_7 \textit{TIGHTENINGINDEX}_i \\ &+ \beta_8 \textit{INDUSTRY OF TARGET}_i + \varepsilon_i \end{aligned}$$

The variables “INDUSTRY OF TARGET” and “REGION OF TARGET” will be further broken down into the dummy variables: “MANUFAC”, “COMPUTER”, “BIOPHARMAC”, “COMMEDIA”, “WHOLERETAILE”, “FINANCE”, “OTHERIND”, “NORTHERN”, “SOUTHERN”, “WESTERN”, and “EASTERN”. These will be further explained in the following sections.

Considering the dependent variable of the model is a multinomial categorical variable, the type of model that will be used for this report will be a multinomial logistic regression. It should be noted that a multinomial probit regression could also be used, however since the logistic regression is more commonly used in scientific research, and the two models don't seem to have many considerable differences, it was decided to use a logistic regression.

Multinomial logistic regression is used to predict categorical placement in or the probability of category membership on a dependent variable based on multiple independent variables³.

In this type of regression, the independent variables can be either dichotomous (i.e., binary) or continuous (i.e., interval or ratio in scale). This is an important feature, as the determinants (described in the following sub-sections) for this report can take on both formats.

Multinomial logistic regression is often considered an attractive analysis because it does not assume normality, linearity, or homoscedasticity. These advantages also apply to the regression used in this report, as the determinants used do not present these characteristics.

One other assumption of this type of regression is that there is no multicollinearity (the presence of two or more independent variables that are highly correlated with each other). This is not expected to happen during this report, since all determinants (due to their nature) seem to be mutually exclusive.

Multinomial logistic regressions also require the dependent variable to be measured at the nominal level with more than or equal to three values. For this report, this requirement is satisfied because the dependent variable can take on the following classifications: "IPO",

³ The interpretation of the coefficients of a multinomial logistic regression will be explained using an example. Consider a dataset with several individuals and data regarding some of their characteristics and their preferred ice cream flavor. The regression aims to discover what are the determinants that lead an individual to prefer one ice cream flavor over another. As such, the dependent variable is an ice cream flavor which can be vanilla, chocolate, or strawberry. For estimation purposes, the reference category for the dependent variable is vanilla. In the output, the coefficient for a certain determinant (for example, puzzle score) is -0,039. This coefficient can be interpreted as follows: if a subject were to increase their puzzle score by one point, the multinomial log-odds of preferring chocolate to vanilla would be expected to decrease by 0,039 unit while holding all other variables in the model constant.

“trade sale” and “secondary sale” (which are the considered exit routes, all of which are mutually exclusive).

4.2. Syndicate size

Syndication occurs when VCs jointly invest in projects, allowing for a diversification of risk. The syndicate size typically increases as the venture develops and requires greater amounts of capital (Espenlaub et al., 2014; Giot & Schwienbacher, 2007).

Several studies aim to explain the rationale and the impact of syndication in Venture Capital (Brander et al., 2002; Giot & Schwienbacher, 2007; Guler, 2007; Hege et al., 2008), stating that the size of the syndicate is positively related to the probability of a successful exit (trade sales and IPOs).

Trade sales and IPOs are considered to be the successful exits since IPOs tend to result in the highest valuation of a company being the preferred exit route for highly valued firms (Cummings & MacIntosh, 2003; Fenn et al., 1997; Gompers & Lerner, 2001), and trade sales provide liquidity (often in the form of cash) and sometimes a premium for the synergies. These exit routes are preferred to secondary sales which are seen as unattractive, as these are the third best option on price and venture capitalists tend to believe “If I can't make money, how can they?” (Wall & Smith, 1997).

The reason for this relationship has been explained many times throughout the literature. It was explained by Schwienbacher (2005) that a larger syndicate helps to add value to the venture through a bigger pool of contacts, making it easier to find strategic buyers. Additionally, Gompers and Lerner (2004) insinuate that a bigger syndicate can also improve the screening process through a second opinion, information, and capital. Brander et al. (2002) suggest that venture capitalists do much more than just select promising projects, as they also add value through management and other activities. Giot and Schwienbacher (2007) also state that including well-established venture capitalists in the syndicate may further facilitate the IPO process through enhanced certification, which may lead to less underpricing.

Taking these findings into consideration, it is expected that a higher VC syndicate size will increase the probability of exit through a trade sale or IPO.

4.3. Venture capital firm experience

In this report, the age of the VC firm will be used as proxy for its experience.

One would expect the more experienced VC firm is, the more likely it is able to add value to the venture as it develops. Therefore, the higher is the probability of successful exits. Supporting this statement, in the UK it was found that ventures which are backed by experienced VCs have high probabilities of exits through M&A or IPO, and a successful exit is more likely when a VC syndicate includes an experienced member (Espenlaub et al., 2014).

Following this reasoning, it has been argued that more experienced VC backers help facilitate IPO exits through their expertise and connections (Cumming & Johan, 2008a; Giot & Schwienbacher, 2007), that firms backed by more reputable VCs are more likely to exit successfully – namely through IPO (Nahata, 2008) – and it has been found that IPOs backed by higher quality VCs are less underpriced (Barry et al., 1990). In contrast, it has also been found that young VCs lacking proven track records of investment success try to exit their investments speedily to signal and raise their profile among prospective investors in their follow-on funds (Gompers, 1996). Extending Gompers's argument, it is reasonable to expect that younger VC firms are most likely to involve exit routes with high public visibility and impact, such as IPOs. However, it should be noted that Espenlaub et al. (2014) findings do not support Gompers' (1996) argument. Therefore, the impact of this determinant on an IPO exit is undefined.

The chances of a trade sale are also affected by the experience of the VC. It is found that due to the wider network of connections among older VCs, the likelihood of a trade sale is higher among these types of VCs (Espenlaub et al., 2014).

The impact of the VCs experience on the probability of a liquidation is less clear. On one hand, more experienced VCs may possess more skills in selecting profitable ventures and adding them value. On the other, they are likely to spot underperforming portfolio companies relatively early and immediately push for liquidation (Espenlaub et al., 2014).

4.4. Regional proximity

The existent literature regarding how regional proximity affects VC exits is essentially about opportunity identification and assessment (pre-investment) and monitoring and value-adding activities (post-investment). Usually, the bigger the geographical proximity of the VC firms and the portfolio company, the bigger are the returns (therefore successful exits) on the investment and the probability of investment (Aizenman & Kendall, 2008; Cumming, Atiqah binti Johan, et al., 2006; Dai et al., 2012; Jääskeläinen & Maula, 2014; Krishnan & Nguyen, 2020; Sorenson & Stuart, 2015).

Regional proximity allows for a better assessment of investment opportunities, as there seems to be less information asymmetry and agency problems between VCs and entrepreneurs. Jääskeläinen and Maula (2014) state that direct ties appear to serve as a channel for the transfer of rich information. As a result, only “Venture capitalists that build axial positions in the industry’s co-investment network invest more frequently in spatially distant companies”, as these are the only ones able to overcome agency and information asymmetry problems that arise from distant investments (Sorenson & Stuart, 2015).

Venture Capitalists that do invest in international firms tend to do so in firms with smaller distance, common language, colonial ties, with presence of high-end human capital, a better business environment, high levels of military expenditure, and deeper financial markets (Aizenman & Kendall, 2008). Much of the informational asymmetries tend to be mitigated if there is a smaller social distance between the investors and the targeted market (Jääskeläinen & Maula, 2014).

There seems to be better involvement by VCs in their more proximate investments. This can be related to cultural distances (Dai et al., 2012). Giot and Schwienbacher (2007) also state there seems to be a higher amount of control when the two parties are geographically closer. This is corroborated by the finding that the VC Directors and total directors proportion is significantly higher for in-state and shorter distance investments as compared to out-of-state or longer distance investments (Krishnan & Nguyen, 2020). This increased control tends to result in a higher probability of successful exits (trade sales and IPOs), and therefore higher returns.

4.5. Amount of investment

The amount of investment in a portfolio company influences the exit decision of the portfolio company (Espenlaub et al., 2014). Higher investment is expected to be a signal of the VC's confidence in the future success of a portfolio company. These same authors also hypothesize that "the larger is the investment size, the higher is the share of IPO exits among successful exits".

Cumming and Johan (2008) have also found that, in Canada, portfolio firms with higher first-round investment sizes tend to be IPOs and acquisitions (trade sales), and that secondary sales, buybacks, and write-offs presented much smaller initial investments (hence, being possibly "riskier investments resulting in worse outcomes") (Cumming & Johan, 2008a). These findings are backed by the ones by Black and Gilson (1998) who state that ventures "that go public (...) receive more total financing and a greater number of rounds than other firms (which may go bankrupt, be acquired, or remain private)" (Black & Gilson, 1998).

4.6. Geographical location of the entrepreneurial firm

The exit decision also depends on the geographical location of the entrepreneurial firm.

As stated by Giot and Schwienbacher (2007), being located in a well-developed cluster of entrepreneurial activities facilitates the success of the venture and of the VC firms, as these locations provide easier access to resources and business contacts. Investors recognize these synergies, leading them to a tendency to allocate their capital to economic centers that have a well-developed cluster of entrepreneurial activities that support transactions and promote the capital flow (Groh et al., 2010).

However, there are other determinants regarding geographical location besides being in a venture cluster which affect the exit decision of a venture. The ones with the biggest importance are the institutional and legal conditions of the specific country.

Legality is an important determinant of the exit decision (Cumming, Fleming, et al., 2006). This is due to the fact that more efficient legal systems mitigate agency problems between entrepreneurs and outside investors, and facilitate VC exits (specifically via IPOs).

Supporting this statement, Espenlaub et al. (2014) found that in the UK, legal systems that provide more investor protection facilitate successful exits such as IPO and M&A. When analyzing European contracts and exits, it was discovered that there is a strong connection between VC control rights and the probability of trade sales. Strong VC control rights result in a higher probability of trade sales, and a lower probability of IPOs and liquidations (Cumming, 2008). In other studies, it was found that countries of German legal origin present investors with less control and veto rights compared to Socialist, Scandinavian, and French legal origin countries (Cumming & Johan, 2008b). As a result, it is expected that firms in countries with strong VC control rights are more likely to exit through a trade sale.

There are other factors regarding the specific countries that can affect the probability of each VC exit, such as cultural differences regarding entrepreneurship (Groh et al., 2010). However, these are difficult parameters to evaluate.

4.7. Market conditions

Differences across countries in terms of the level of domestic stock market activity are likely to influence the probability and the route of exit (Black & Gilson, 1998; Cumming, Fleming, et al., 2006; Cumming & MacIntosh, 2003).

More active stock markets increase the probability of exit through IPOs. According to Black and Gilson (1998), a well-developed stock market is what permits ventures to exit through IPOs and is critical to the existence of a vibrant venture capital market. Besides the hotness of IPO markets (with high equity valuations), unfavorable debt market conditions positively impact the probability of an IPO (Brau et al., 2003; Lerner, 1994).

As such, firms tend to look for windows of opportunities between the debt and stock markets. For example, if funds are able to arbitrage debt markets against equity markets when debt is more accessible, it would be expected a higher probability for trade sales.

In line with these findings, in Europe, more specifically in the UK, Espenlaub et al (2014) found that the likelihood of a successful exit (M&A and IPO) is high in countries with, and at times of, high stock market liquidity.

Favorable debt market conditions may also increase the likelihood of a secondary buy-out transaction. It has been found that a higher availability of credit leads to higher transaction prices and lower buyout fund returns, as PE and VC firms borrow as much as they can for each deal (Axelson et al., 2013). Additionally, it has also been discovered that credit markets and securitization have an effect on LBOs, as the LBO boom in the years before the financial crisis was largely fueled by cheap debt with few covenants (Shivdasani et al., 2011).

5. Data construction and sample characteristics

Since Venture Capital is a form of Private Equity, Venture Capitalists are not required to disclose their activity and financial statements similarly to public companies. Additionally, the activity presents information asymmetry between the different parties. As such, the availability of reliable data is an issue in VC research, making it difficult to clarify conclusively the level of investments and exit dynamics (Kaplan & Lerner, 2017).

5.1. Data construction

The database used for this report is made up of Venture Capital exit deals from the 1st of January 2007 to 31st of December 2021, it also includes variables regarding market conditions before the exit.

In order to obtain Venture Capital exits, it was used the Zephyr platform, more specifically its Private Equity dataset. However, since this report is only related to Venture Capital, to ensure all observations were of this nature, the dataset used only considered deals where the target was 15 years or younger.

The database still presented some exits which were not relevant for answering the research question, as such further filtering was necessary. Firstly, all exits that could not be classified as trade sales, secondary sales or IPOs were deleted – some examples would be the exercising of options. Additionally, if there were several observations regarding the same company, the ones which occurred after the first exit were discarded.

With this alteration, the types of exits in the dataset were trade sales, secondary sales, and IPOs. The dataset contains 330 deals, 235 of which are IPOs, 7 trade sales, and 88 secondary sales. To be noted that deals which did not contain data for the investment value were kept, leaving 274 deals with data for all variables of which 233 are IPO, 4 are trade sales, and 37 are secondary sales.

In the following sub-sections, it will be discussed how the different variables were treated.

5.1.1. Entrepreneurial firm-related variables

Firstly, the exit type was treated as a set of dummy variables which were named: IPO (for an IPO exit), Trade Sale (for trade sale exits), and Secondary Sales (if the exit was a secondary sale). The respective variable would be set to 1 if the firm exited according to the exit specified by the variable, and 0 otherwise⁴. The classification of this set of dummy variables would allow the software to classify the exit type in a numerical form and would constitute the outcomes for the model.

The variable regarding the investment amount for the deal (in thousands of euros) was named “INVESTMENT”.

In order to account for the possible effect of the industries, variables regarding this factor were considered. As such, regarding the industry of the target, it was also used a dummy variable which could be: MANUFAC (manufacturing), COMPUTER (hardware and software), BIOPHARMAC (biotechnology and pharmaceuticals), COMMEDIA (communication and media), WHOLERETAIL (wholesale and retail), FINANCE (finance, insurance, and real estate) and OTHERIND (other industries than those listed above). These variables were set equal to 1 if the given firm belongs to the specified industry.

The geographical location of the target was also set to be a dummy variable which could take on the following values: NORTHERN (for the countries of Denmark, Estonia, Faroe Islands, Finland, Iceland, Ireland, Latvia, Lithuania, Norway, Sweden, United Kingdom); SOUTHERN (for the countries of Albania, Andorra, Bosnia and Herzegovina, Croatia, Gibraltar, Greece, Italy, Malta, Montenegro, North Macedonia, Portugal, San Marino, Serbia, Slovenia, Spain); WESTERN (for the countries of Austria, Belgium, France, Germany, Leichtenstein, Luxembourg, Monaco, Netherlands, Switzerland); and EASTERN (for the countries of Belarus, Bulgaria, Czech Republic, Hungary, Poland, Republic of Moldova, Romania, Russian Federation, Slovakia, Ukraine). These were set to 1 if the target country

⁴ The different exits were individually classified by hand. If the acquiror was a Private Equity or Venture Capital firm, then the deal was considered a secondary sale. If the acquiror was a traditional company, the deal was classified as a trade sale. If the deal title indicated the transaction was an IPO, the deal was classified as such.

belongs to the region specified, and 0 otherwise. This classification is based on the United Nations' publication "Standard Country or Area Codes for Statistical Use" ⁵.

5.1.2. Venture capital firm-related variables

The variable regarding the Venture Capitalist experience was considered to be equal to the average age of all vendors involved at the time of completion of the deal. The name was set to be "VCEXPERIENCE".

The variable regarding the regional proximity between the portfolio company and the VC was considered to be a dummy variable. It would take on a value of 1 in the case one of the VC was headquartered in the same country as the target, and 0 otherwise. The name of this variable is "REGPROX".

The variable regarding the syndicate size was called "SYNDSIZE".

5.1.3. Market conditions variables

Regarding the macroeconomic variables, it was decided to collect the values of the previous trimester of the deal. This decision was based on the reasoning that decisions regarding the financing (which are affected by the market conditions) are made before the transaction occurs. Hence, by including values previous to the deal, the model would consider the variables the decision makers had access to at the time of the decision.

To measure the stock market liquidity, it was considered the return of the Euronext 100 Index. The information on the return of the index was collected from Yahoo Finance, in the

⁵ For more details, check the United Nations' website in <https://unstats.un.org/unsd/methodology/m49/>

page dedicated to the index ⁶. The variable regarding this measure was named “EURONEXTRETURN”.

For estimating the debt market’s conditions, it was used the FED Tightening Index. This index represents the net percentage of domestic banks that have tightened standards for Commercial and Industrial loans to small firms in a quarter. The values of this index were collected from the Board of Governors of Federal Reserve System website ⁷. The variable regarding this measure was named “TIGHTENINGINDEX”.

5.2. Descriptive Analysis

5.2.1. Correlation Matrix

The descriptive analysis started by obtaining the correlation matrix of the variables, which is presented in Appendix 1. This was done to ensure there were no issues with correlation. The majority of the values in the correlation matrix are less than 0.5, making it possible that correlation doesn’t seem to be an issue in the data.

Despite this, there are some exceptions. The first exception is regarding the correlations between the variables regarding the target’s region, these correlations do not seem to be problematic since they are all referent to the geographic location of the target. The second exception refers to the industry of the target firm, as “Target industry” presents high correlations with the variables “COMPUTER”, “BIOPHARMACY”, “COMMEDIA”, “WHOLERETAL”, and “OTHERIND”, this also does not seem to be problematic as it can be justified by the fact that these variables are referring to the same characteristic. Another exception is the correlation between the variable “Exit” with “IPO”, “Trade Sale” and “Secondary Sale”, which has the same explanation as the previous group. Finally, the

⁶ For more information, check the following link < <https://finance.yahoo.com/quote/%5EN100/history?period1=1609459200&period2=1656115200&interval=1mo&filter=history&frequency=1mo&includeAdjustedClose=true> >

⁷ For more information, check the Board of Governors of Federal Reserve System official website and the link < <https://www.federalreserve.gov/data/sloos/sloos-202204-charts-data.htm> >

variables “IPO” and “Secondary Sale” also present a high correlation, this can be due to the fact that these are the two most common exits in the sample, leading to correlation.

5.2.2. Descriptive Statistics

Descriptive statistics of all independent variables for each exit route.

For a better descriptive analysis of the data, it was also calculated descriptive statistics of the variables for each of the exit routes, which are presented in Table 1.

The amount of investment appears to have a smaller median and mean for trade sales than for the other exits. However, according to the descriptive tests conducted in the next section, these aren't statistically significant and therefore low values could be associated with the low number of observations or with a high standard deviation – which is the case for the exit.

The majority of IPOs seem to happen in Northern Europe and other industries, the majority of Secondary Sales happen in Western Europe and manufacturing industry, and the majority of trade sales seem to happen in Northern Europe and manufacturing, software and hardware, and communication and media industries.

The syndicate size appears to be the biggest when the exit is a Trade Sale, Secondary sales present the lowest syndicate sizes. This is congruent with the literature which states that the size of the syndicate is positively related to the probability of a successful exit (trade sales and IPOs) (Brander et al., 2002; Giot & Schwienbacher, 2007; Guler, 2007; Hege et al., 2008).

Most Venture Capital exits (regarding all types) appear to occur in the same country as at least one of the members of the syndicate. However, considering the results of the Wilcoxon rank-sum and t-test results of the following section (which indicate the median and mean is not statistically different for any of the exits), it can be inferred that the regional proximity is likely not a determinant on what exit the venture takes on, but it is likely to occur in most cases.

The Venture Capitalists' experience appears to be smaller in the case of trade sales. This data allied with the result of the Wilcoxon rank-sum test which states there is a statistical

significant difference in the median of IPO and trade sale exits, could be a sign this is an important variable to describe the choice between an IPO or a trade sale exit.

The stock market returns (measured by the variable EURONEXTRETURN) do not appear to be very different according to the type of exit. However, it does showcase positive values in all exits, which could indicate that despite the stock market conditions not affecting the choice of the type of exit, it can impact the choice of whether to exit. Ventures seem to exit when the market conditions present positive stock returns.

The bond market conditions appear to be decisive in the choice between an IPO or a Secondary Sale (as it inferred from the results of the Wilcoxon rank-sum and t-test), which is reflected in the median and mean of the variable TIGHTENINGINDEX. When the index is higher (which is indicative of tighter debt market conditions as more banks are tightening their standards for Commercial and Industrial loans to small firms), there seems to be a higher probability of a Secondary Sale than an IPO. According to the data, Trade Sales seem to be more likely in the opposite scenario.

Table 1

Descriptive statistics of all independent variables for each exit route. The variables INVESTMENT, NORTHERN, SOUTHERN, WESTERN, EASTERN, EURONEXTRETRUN, and TIGHTENINGINDEX were simplified so that the table could fit into the page.

The rows Mean, Median, and SD depicts the mean, median, and standard deviation (respectively) of all variables. The rows Sum and Obs are only filled for the dummy variables. The Sum row sums all the observations for the different exits, resulting in the number of observations that present the value 1 for the dummy variable depicted in the column for the specified exit. The variable Obs shows the number of observations of the different exits, this row and the Sum row can depict the percentage of observations that present the value 1 for the dummy variable in each column for the specified exit.

	INVESTM	NORTH	SOUTH	WEST	EAST	MANUFAC	COMPUTE R	BIOPHAR MAC	COMMEDI A	WHOLERE TAIL	FINANCE	OTHERIND	SYNDSIZE	REGPROX	VCEXP	EUROR	TINDEX
Exit																	
IPO																	
Mean	340 413.02	0.67	0.05	0.23	0.05	0.21	0.18	0.06	0.03	0.13	0.14	0.25	2.66	0.69	21.14	0.04	0.00
Median	176 728.91	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	12.67	0.03	-0.04
SD	481 015.66	0.47	0.21	0.42	0.21	0.41	0.39	0.24	0.17	0.34	0.34	0.43	2.33	0.46	36.62	0.07	0.15
Sum		158	11	55	11	50	43	14	7	31	32	58		162			
Obs		235	235	235	235	235	235	235	235	235	235	235		234			
Secondary Sale																	
Mean	344 663.63	0.35	0.16	0.47	0.02	0.33	0.24	0.02	0.08	0.06	0.05	0.23	1.50	0.74	16.01	0.03	0.04
Median	110 773.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	12.00	0.03	-0.01
SD	574 836.45	0.48	0.37	0.50	0.15	0.47	0.43	0.15	0.27	0.23	0.21	0.42	1.10	0.44	12.49	0.09	0.18
Sum		31	14	41	2	29	21	2	7	5	4	20		65			
Obs		88	88	88	88	88	88	88	88	88	88	88		88			
Trade Sale																	
Mean	294 573.73	0.43	0.14	0.29	0.14	0.29	0.29	0.00	0.29	0.14	0.00	0.00	3.71	1.00	8.63	0.02	-0.06
Median	22 750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	6.50	0.03	-0.06
SD	554 385.39	0.53	0.38	0.49	0.38	0.49	0.49	0.00	0.49	0.38	0.00	0.00	3.30	0.00	5.65	0.12	0.03
Sum		3	1	2	1	2	2	0	2	1	0	0		7			
Obs		7	7	7	7	7	7	7	7	7	7	7		7			
Total																	
Mean	340 317.82	0.58	0.08	0.30	0.04	0.25	0.20	0.05	0.05	0.11	0.11	0.24	2.37	0.71	19.51	0.04	0.01
Median	162 657.26	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	12.00	0.03	-0.04
SD	493 570.67	0.49	0.27	0.46	0.20	0.43	0.40	0.22	0.22	0.32	0.31	0.43	2.17	0.45	31.68	0.07	0.16
Sum		192	26	98	14	81	66	16	16	37	36	78		234			
Obs		330	330	330	330												

Descriptive statistics of all independent variables broken down by industry

Further descriptive analysis was conducted, as the same statistics presented in Table 1 are further broken down according to the industry (Table 2) and region (Table 3) of the target firm.

In Table 2 it can be seen that investment values tend to be lower for the biotechnology and pharmacy industry when the venture exits through an IPO, in the case of a Secondary Sale the industry with the lowest investment is the finance, insurance and real estate industry, and for the case of a trade sale the industry with the lowest investment level is again the biotechnology and pharmacy industry. The industries with highest levels of investment were not easy to determine, as it appeared these values were very similar among the different industries.

The syndicate size appears to be highest in the hardware and software industry across all exits. Higher syndicate sizes and higher experience of Venture Capitalists seem to characterize the exits of this industry in Venture Capital.

From the second table it can also be seen that the Venture Capitalists' experience is higher for the hardware and software industry for all exits, the industries with lowest syndicate's experience were varied for the different exits.

In table 2 it can also be seen that the stock market return seems to be lower for the biotechnology and software industry across all exits. Because the industries are different for the various exits, no conclusions were taken for the case of highest returns of the Euronext index.

Due to the heterogeneity of the data, no conclusions could be made for the tightening index across industries in the various exits on table 2.

Table 2

Descriptive statistics of all independent variables broken down by industry. The variables EURONEXTRETRUN, and TIGHTENINGINDEX were simplified so that the table could fit into the page.

The rows Mean, Median, and SD depicts the mean, median, and standard deviation (respectively) of all variables. The rows Sum and Obs are only filled for the dummy variables. The Sum row sums all the observations for the different exits in each industry, resulting in the number of observations that present the value 1 for the dummy variable depicted in the column for the specified exit and industry. The variable Obs shows the number of observations of the different exits, this row and the Sum row can depict the percentage of observations that present the value 1 for the dummy variable in each column for the specified exit and industry.

	INVESTMENT	NORTHER N	SOUTHER N	WESTERN	EASTERN	SYNDSIZE	REGPROX	VCEXP	EUROR	TINDEX
Exit										
IPO										
Target industry										
BIOPHARMAC										
Mean	111 182.65	0.43	0.00	0.43	0.14	3.43	0.71	12.73	0.02	-0.04
Median	35 186.46	0.00	0.00	0.00	0.00	2.50	1.00	10.75	0.02	-0.06
SD	198 135.84	0.51	0.00	0.51	0.36	2.93	0.47	8.52	0.04	0.06
Sum		6	0	6	2		10			
Obs		14	14	14	14		14			
COMMEDIA										
Mean	757 580.07	0.29	0.14	0.57	0.00	2.14	0.43	20.21	0.02	-0.07
Median	652 174.00	0.00	0.00	1.00	0.00	2.00	0.00	10.00	0.03	-0.07
SD	689 591.07	0.49	0.38	0.53	0.00	0.69	0.53	18.41	0.06	0.03
Sum		2	1	4	0		3			
Obs		7	7	7	7		7			
COMPUTER										
Mean	405 955.73	0.72	0.02	0.16	0.09	3.88	0.79	25.38	0.04	0.04
Median	180 087.08	1.00	0.00	0.00	0.00	3.00	1.00	13.00	0.03	-0.01
SD	596 178.70	0.45	0.15	0.37	0.29	3.43	0.41	53.34	0.07	0.15
Sum		31	1	7	4		34			
Obs		43	43	43	43		43			
FINANCE										
Mean	465 688.82	0.72	0.16	0.06	0.06	2.00	0.75	34.49	0.06	-0.02
Median	283 210.71	1.00	0.00	0.00	0.00	2.00	1.00	10.50	0.05	-0.06
SD	677 062.38	0.46	0.37	0.25	0.25	1.16	0.44	63.96	0.08	0.15
Sum		23	5	2	2		24			
Obs		32	32	32	32		32			
MANUFAC										
Mean	280 227.33	0.54	0.04	0.38	0.04	2.12	0.64	16.06	0.04	0.00
Median	157 183.89	1.00	0.00	0.00	0.00	2.00	1.00	11.83	0.03	-0.04
SD	333 141.21	0.50	0.20	0.49	0.20	1.65	0.48	20.52	0.05	0.14
Sum		27	2	19	2		32			
Obs		50	50	50	50		50			
OTHERIND										
Mean	246 196.53	0.78	0.03	0.17	0.02	2.38	0.67	16.54	0.04	-0.02
Median	119 027.21	1.00	0.00	0.00	0.00	2.00	1.00	13.00	0.03	-0.05
SD	310 678.00	0.42	0.18	0.38	0.13	1.87	0.48	13.85	0.07	0.14
Sum		45	2	10	1		38			
Obs		58	58	58	58		57			
WHOLERETAIL										
Mean	409 011.51	0.77	0.00	0.23	0.00	2.81	0.68	22.27	0.05	0.03
Median	210 991.00	1.00	0.00	0.00	0.00	2.00	1.00	14.00	0.04	-0.04
SD	502 931.17	0.43	0.00	0.43	0.00	2.44	0.48	27.63	0.07	0.21
Sum		24	0	7	0		21			
Obs		31	31	31	31		31			

	INVESTMENT	NORTHER N	SOUTHER N	WESTERN	EASTERN	SYNDSIZE	REGPROX	VCEXP	EUROR	TINDEX
Secondary Sale										
Target industry										
BIOPHARMAC										
Mean	566 280.00	0.00	0.00	1.00	0.00	1.00	1.00	11.50	-0.03	-0.02
Median	566 280.00	0.00	0.00	1.00	0.00	1.00	1.00	11.50	-0.03	-0.02
SD	.	0.00	0.00	0.00	0.00	0.00	0.00	12.02	0.04	0.09
Sum		0	0	2	0		2			
Obs		2	2	2	2		2			
COMMEDIA										
Mean	1 052 054.33	0.00	0.00	1.00	0.00	1.57	0.71	18.07	-0.02	0.01
Median	116 000.00	0.00	0.00	1.00	0.00	2.00	1.00	17.50	0.00	0.04
SD	1 687 396.53	0.00	0.00	0.00	0.00	0.53	0.49	8.63	0.07	0.05
Sum		0	0	7	0		5			
Obs		7	7	7	7		7			
COMPUTER										
Mean	238 843.74	0.52	0.10	0.33	0.05	1.67	0.76	20.02	0.06	0.03
Median	69 900.00	1.00	0.00	0.00	0.00	1.00	1.00	15.00	0.05	0.00
SD	367 998.50	0.51	0.30	0.48	0.22	1.83	0.44	16.27	0.07	0.13
Sum		11	2	7	1		16			
Obs		21	21	21	21		21			
FINANCE										
Mean	34 012.60	0.75	0.00	0.25	0.00	1.25	0.75	10.25	0.06	0.04
Median	34 012.60	1.00	0.00	0.00	0.00	1.00	1.00	11.00	0.04	-0.04
SD	10 588.79	0.50	0.00	0.50	0.00	0.50	0.50	2.36	0.07	0.18
Sum		3	0	1	0		3			
Obs		4	4	4	4		4			
MANUFAC										
Mean	592 577.02	0.24	0.28	0.48	0.00	1.48	0.72	14.93	0.00	0.05
Median	500 000.00	0.00	0.00	0.00	0.00	1.00	1.00	12.00	0.02	-0.03
SD	562 379.02	0.44	0.45	0.51	0.00	0.69	0.45	9.47	0.10	0.23
Sum		7	8	14	0		21			
Obs		29	29	29	29		29			
OTHERIND										
Mean	154 434.86	0.45	0.20	0.35	0.00	1.45	0.75	14.77	0.05	0.05
Median	80 000.00	0.00	0.00	0.00	0.00	1.00	1.00	12.25	0.05	-0.01
SD	189 736.50	0.51	0.41	0.49	0.00	1.00	0.44	13.91	0.08	0.19
Sum		9	4	7	0		15			
Obs		20	20	20	20		20			
WHOLERETAIL										
Mean	262 519.69	0.20	0.00	0.60	0.20	1.40	0.60	14.00	-0.01	0.06
Median	198 886.68	0.00	0.00	1.00	0.00	1.00	1.00	8.00	0.02	-0.01
SD	279 911.75	0.45	0.00	0.55	0.45	0.89	0.55	14.70	0.15	0.20
Sum		1	0	3	1		3			
Obs		5	5	5	5		5			
Trade Sale										
Target industry										
COMMEDIA										
Mean	14 000.00	0.00	0.00	1.00	0.00	1.50	1.00	4.75	-0.10	-0.05
Median	14 000.00	0.00	0.00	1.00	0.00	1.50	1.00	4.75	-0.10	-0.05
SD	.	0.00	0.00	0.00	0.00	0.71	0.00	2.47	0.15	0.03
Sum		0	0	2	0		2			
Obs		2	2	2	2		2			
COMPUTER										
Mean	1 126 006.15	0.50	0.00	0.00	0.50	8.00	1.00	15.71	0.06	-0.08
Median	1 126 006.15	0.50	0.00	0.00	0.50	8.00	1.00	15.71	0.06	-0.08
SD	.	0.71	0.00	0.00	0.71	2.83	0.00	1.36	0.05	0.03
Sum		1	0	0	1		2			
Obs		2	2	2	2		2			
MANUFAC										
Mean	19 144.38	0.50	0.50	0.00	0.00	3.00	1.00	8.25	0.09	-0.04
Median	19 144.38	0.50	0.50	0.00	0.00	3.00	1.00	8.25	0.09	-0.04
SD	17 473.49	0.71	0.71	0.00	0.00	1.41	0.00	4.60	0.13	0.02
Sum		1	1	0	0		2			
Obs		2	2	2	2		2			
WHOLERETAIL										
Mean	.	1.00	0.00	0.00	0.00	1.00	1.00	3.00	0.03	-0.04
Median	.	1.00	0.00	0.00	0.00	1.00	1.00	3.00	0.03	-0.04
SD	.	.	.	.	.	.	.	.	.	.
Sum		1	0	0	0		1			
Obs		1	1	1	1		1			

Descriptive statistics of all independent variables broken down by region

According to Table 3, the European region which seems to obtain less investment in the case of IPOs and Secondary Sales is Eastern Europe, whilst the region that obtains more investment seems to be Western Europe. This finding seems to be plausible as Western Europe includes the countries which have more developed financial markets such as Germany and Luxembourg.

The syndicate size seems to be of the relative same size across the different regions for the same exit. However, the syndicate size appears to be significantly different across the different exits.

The Venture Capitalists' experience appears to be significantly lower in Eastern Europe for both the IPO and Secondary Sale exits.

Due to the heterogeneity of the data, no conclusions could be made for the stock market returns across industries in the various exits on table 3.

In the case of the debt market conditions, it appears that for the exits IPO and Secondary Sale, Western Europe seems to have higher tightening indexes at the time of exit. This can mean that for an IPO or Secondary Sale to occur in Western Europe, it might be necessary, or the exit might be a result of high-cost debt contracts. In contrast, Eastern and Southern Europe seem to have the opposite behavior.

Table 3

Descriptive statistics of all independent variables broken down by region. The variables EURONEXTRETRUN, and TIGHTENINGINDEX were simplified so that the table could fit into the page.

The rows Mean, Median, and SD depicts the mean, median, and standard deviation (respectively) of all variables. The rows Sum and Obs are only filled for the dummy variables. The Sum row sums all the observations for the different exits in each region, resulting in the number of observations that present the value 1 for the dummy variable depicted in the column for the specified exit and region. The variable Obs shows the number of observations of the different exits, this row and the Sum row can depict the percentage of observations that present the value 1 for the dummy variable in each column for the specified exit and region.

	INVESTMENT	MANUFAC	COMPUTER	BIOPHAR MAC	COMMEDIA	WHOLER ETAIL	FINANCE	OTHERIND	SYNDSIZE	REGPROX	VCEXP	EUROR	TINDEX
Exit													
IPO													
Target region													
EASTERN													
Mean	34 328.16	0.18	0.36	0.18	0.00	0.00	0.18	0.09	2.36	0.80	7.47	0.01	-0.05
Median	13 608.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	6.67	0.00	-0.06
SD	55 689.05	0.40	0.50	0.40	0.00	0.00	0.40	0.30	1.80	0.42	4.85	0.04	0.04
Sum		2	4	2	0	0	2	1		8			
Obs		11	11	11	11	11	11	11		10			
NORTHERN													
Mean	322 899.26	0.17	0.20	0.04	0.01	0.15	0.15	0.28	2.61	0.73	21.84	0.05	0.00
Median	165 334.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	13.00	0.04	-0.04
SD	464 516.52	0.38	0.40	0.19	0.11	0.36	0.35	0.45	2.25	0.45	38.32	0.07	0.15
Sum		27	31	6	2	24	23	45		115			
Obs		158	158	158	158	158	158	158		158			
SOUTHERN													
Mean	217 975.82	0.18	0.09	0.00	0.09	0.00	0.45	0.18	2.09	0.64	26.55	0.05	-0.05
Median	184 262.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	9.00	0.04	-0.06
SD	232 259.03	0.40	0.30	0.00	0.30	0.00	0.52	0.40	1.22	0.50	59.54	0.09	0.08
Sum		2	1	0	1	0	5	2		7			
Obs		11	11	11	11	11	11	11		11			
WESTERN													
Mean	470 546.08	0.35	0.13	0.11	0.07	0.13	0.04	0.18	2.98	0.58	20.78	0.03	0.01
Median	247 250.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	12.67	0.03	-0.04
SD	567 149.48	0.48	0.34	0.31	0.26	0.34	0.19	0.39	2.81	0.50	28.90	0.06	0.16
Sum		19	7	6	4	7	2	10		32			
Obs		55	55	55	55	55	55	55		55			

	INVESTMENT	MANUFAC	COMPUTER	BIOPHAR MAC	COMMEDIA	WHOLER ETAIL	FINANCE	OTHERIND	SYNDSIZE	REGPROX	VCEXP	EUROR	TINDEX
SecondarySale													
Target region													
EASTERN													
Mean	7 305.40	0.00	0.50	0.00	0.00	0.50	0.00	0.00	1.00	0.50	8.50	0.02	-0.02
Median	7 305.40	0.00	0.50	0.00	0.00	0.50	0.00	0.00	1.00	0.50	8.50	0.02	-0.02
SD	.	0.00	0.71	0.00	0.00	0.71	0.00	0.00	0.00	0.71	6.36	0.03	0.10
Sum		0	1	0	0	1	0	0		1			
Obs		2	2	2	2	2	2	2		2			
NORTHERN													
Mean	200 900.79	0.23	0.35	0.00	0.00	0.03	0.10	0.29	1.26	0.58	20.69	0.03	0.05
Median	110 773.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	12.00	0.03	-0.01
SD	304 777.71	0.43	0.49	0.00	0.00	0.18	0.30	0.46	0.44	0.50	17.40	0.08	0.20
Sum		7	11	0	0	1	3	9		18			
Obs		31	31	31	31	31	31	31		31			
SOUTHERN													
Mean	422 237.44	0.57	0.14	0.00	0.00	0.00	0.00	0.29	1.79	0.93	11.17	0.02	-0.02
Median	37 300.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.00	10.50	0.02	-0.04
SD	559 240.06	0.51	0.36	0.00	0.00	0.00	0.00	0.47	0.97	0.27	6.72	0.10	0.15
Sum		8	2	0	0	0	0	4		13			
Obs		14	14	14	14	14	14	14		14			
WESTERN													
Mean	484 005.36	0.34	0.17	0.05	0.17	0.07	0.02	0.17	1.61	0.80	14.50	0.03	0.06
Median	201 500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	12.50	0.03	-0.02
SD	783 532.65	0.48	0.38	0.22	0.38	0.26	0.16	0.38	1.45	0.40	8.15	0.09	0.18
Sum		14	7	2	7	3	1	7		33			
Obs		41	41	41	41	41	41	41		41			

	INVESTMENT	MANUFAC	COMPUTER	BIOPHAR MAC	COMMEDIA	WHOLER ETAIL	FINANCE	OTHERIND	SYNDSIZE	REGPROX	VCEXP	EUROR	TINDEX
TradeSale													
Target region													
EASTERN													
Mean	.	0.00	1.00	0.00	0.00	0.00	0.00	0.00	6.00	1.00	14.75	0.03	-0.06
Median		0.00	1.00	0.00	0.00	0.00	0.00	0.00	6.00	1.00	14.75	0.03	-0.06
SD	.	.	.	.	.	.	.	.	.	.	.	.	.
Sum		0	1	0	0	0	0	0		1			
Obs		1	1	1	1	1	1	1		1			
NORTHERN													
Mean	566 397.45	0.33	0.33	0.00	0.00	0.33	0.00	0.00	4.33	1.00	8.22	0.04	-0.06
Median	566 397.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	5.00	0.03	-0.04
SD	791 406.21	0.58	0.58	0.00	0.00	0.58	0.00	0.00	4.93	0.00	7.38	0.05	0.04
Sum		1	1	0	0	1	0	0		3			
Obs		3	3	3	3	3	3	3		3			
SOUTHERN													
Mean	31 500.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	1.00	11.50	0.18	-0.06
Median	31 500.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	1.00	11.50	0.18	-0.06
SD	.	.	.	.	.	.	.	.	.	.	.	.	.
Sum		1	0	0	0	0	0	0		1			
Obs		1	1	1	1	1	1	1		1			
WESTERN													
Mean	14 000.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.50	1.00	4.75	-0.10	-0.05
Median	14 000.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.50	1.00	4.75	-0.10	-0.05
SD	.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00	2.47	0.15	0.03
Sum		0	0	0	2	0	0	0		2			
Obs		2	2	2	2	2	2	2		2			

5.2.3. Descriptive Tests

In order to determine whether the three types of exits are different in terms of their means and medians (for numerical variables), t-tests and Wilcoxon rank-sum (or Mann-Whitney) tests were conducted, respectively. To be noted that it was chosen to conduct a Wilcoxon rank-sum test instead of a signed-rank test since the samples for the 3 exits are considered independent from each other.

In order to conduct these tests, two accessory dummy variables were created to use as restrictions. The variable “Dummy1” would assume the value 1 if the exit was an IPO or a Trade Sale, and 0 otherwise; the variable “Dummy 2” would assume the value 1 if the exit is IPO or Secondary Sale, and 0 otherwise. As it can be inferred by this choice of dummy classification, the exit IPO was considered to be the base variable, this was due to the fact it is the most frequent in the data obtained.

Assuming a significance level of 10%, the t-test determined that there are no statistically significant differences between the different exits in the means of the following numerical variables: “INVESTMENT”, and “VCEXPRIENCE”. The variables “SYNDSIZE”, “EURONEXTRETURN”, and “TIGHTENINGINDEX” seem to present statistically different means only in the IPO and Secondary Sale exits. These findings are reported in Appendix 2.

The Wilcoxon rank-sum test was conducted for the same variables. Assuming again a 10% significance level, the variables “INVESTMENT” and “EURONEXTRETURN” do not present statistically significant different medians for the different exit routes. The variables “SYNDSIZE”, and “TIGHTENINGINDEX” seem to have statistically significant different medians only for the exits IPO and Secondary Sale. The variable “VCEXPRIENCE” appears to present statistically different medians exclusively between the exits IPO and Trade Sale. The output of the Mann-Whitney test can be found in Appendix 3.

As the variable “INVESTMENT” does not present statistically different means nor medians for any of the different exits, it can mean that the investment value of a deal does not affect its exit route. Since the variables “SYNDSIZE” and “TIGHTENINGINDEX” present statistically different means and medians for IPOs and Secondary Sales, it could be a sign

that the syndicate size and the debt market conditions affect the choice between an IPO or a Secondary Sale. The remaining variables (“VCEXPERIENCE” and “EURONEXTRETURN”) present statistically different means and medians but for different groups of exit routes, not allowing for much interpretation on the impact of the VC firm experience or stock market conditions in the choice of exit.

6. Estimation Results

6.1. Model Improvement

6.1.1. First Model

In this section the model presented in the methodology section (4) the predictive model will be estimated. For it, the software Stata 17.0 will be used.

However, in order to not incur the dummy fallacy, the variables “OTHERIND” and “EASTERN” will be dropped. To be noted that Stata does this automatically if all the variables are presented in the code. The output can be found on table 4.

Table 4

Model output to first model estimation. The coefficients for the IPO exit are not showcased since it is the base outcome for the model. *, **, *** indicate that the variable is statistically significant at the 10%, 5%, and 1% level, respectively.

	Secondary Sale		Trade Sale	
	Coefficient	P-value	Coefficient	P-value
INVESTMENT	-5.24e-08	0.90	-9.38e-07	0.61
NORTHERN	-0.13	0.91	17.17	0.99
SOUTHERN	1.89	0.13	18.50	0.99
WESTERN	0.95	0.42	15.48	0.99
MANUFAC	-0.61	0.27	16.37	0.99
COMPUTER	0.17	0.77	14.85	0.99
BIOPHARMAC	-1.15	0.32	-0.86	1.00
COMMEDIA	0.003	0.99	19.47	0.99
WHOLERETAIL	-0.41	0.55	0.27	1.00
FINANCE	-1.51*	0.08	-1.03	1.00
SYNDSIZE	-0.36***	0.01	0.62*	0.10
REGPROX	0.49	0.29	14.41	0.99
VCEXPRIENCE	-0.001	0.90	-0.39	0.13
EURONEXTRETURN	-2.86	0.26	6.31	0.51
TIGHTENINGINDEX	1.21	0.34	-5.51	0.42
_cons	-1.39	0.26	-48.84	0.99

As can be seen on table 4, the model does not appear to have many statistically significant variables, the exceptions are (using a significance level of 10%) the Syndicate Size for both exits, and the Finance industry for Secondary Sales over an IPO.

The model seems to have a decent predictive power, as it can be seen in figure 2, and table 5. The table presents the predicted probabilities (depicted as “pmlogit”), a perfect model would present the values 0.66-1 for the predicted probability of the first outcome which is IPO (in the table as “pmlogit1”), 0.33-0.66 for the predicted probability of the second outcome which is Secondary Sale (“pmlogit2”), and 0-0.33 for the predicted probability of the third outcome which is Trade Sale (“pmlogit3”). The model seems to predict very well exits via an IPO, but the same cannot be said for the Secondary Sale and Trade Sale. The minimum values of pmlogit2 are a lot smaller than 0.33 (table 5) and there seems to have plenty of observations with values below that threshold (figure 2). The predicted probabilities for Trade Sale, although not perfect, seem to be acceptable.

Figure 2

Predicted probabilities of the model. To note that Pr(IPO) represents the predicted probability of the first outcome (IPO exit), Pr(SecondarySale) refers to the predicted probability of the second outcome (Secondary Sale exit), and Pr(TradeSale) refers to the predicted probability of the third possible outcome (Trade Sale exit).

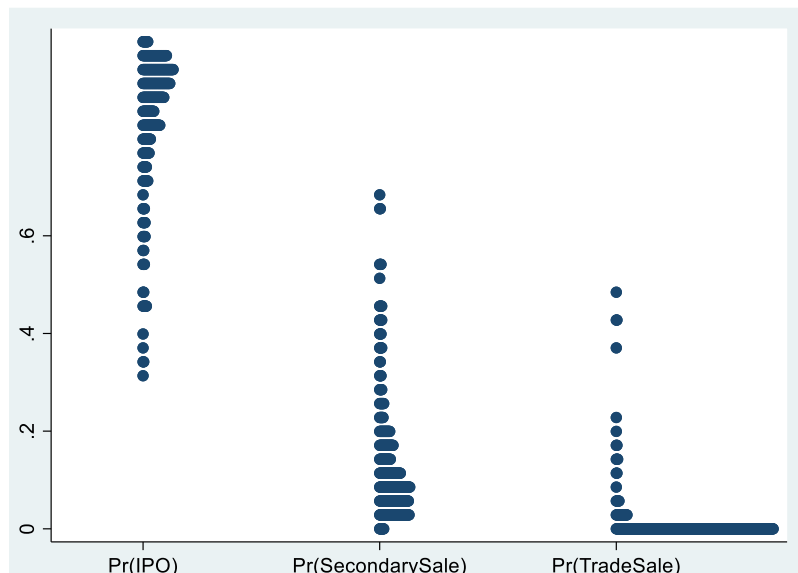


Table 5

Predicted probabilities of the model. To note that pmlogit1 represents the predicted probability of the first outcome (IPO exit), the pmlogit2 refers to the predicted probability of the second outcome (Secondary Sale exit), and the pmlogit3 refers to the predicted probability of the third possible outcome (Trade Sale exit).

	Obs	Min	Max
pmlogit1	272	0.3236	0.9974
pmlogit2	272	0.0017	0.6764
pmlogit3	272	0	0.4706

Despite the predictive power, the model appears to have too many variables since many of them do not appear to be statistically significant. As such, in order to improve the model, and to discover exactly what are the determinants of each Venture Capital exit in Europe, some Wald tests will be conducted, and a second model will be estimated based on their results.

6.1.2. Improved Model

The process for improving the model consisted in firstly running a set of Wald tests for all independent variables (to be noted that the variables regarding the target industry and the target region were grouped, and one Wald Test was run on each of these groups) and checked which variable had the highest p-value. That variable would not be considered for the next model estimated, and the independent variables of that model would be subject to another round of Wald tests. This process would be repeated until the estimated model was worse – according to the Likelihood Ratio (LR) test – than the previous model.

This process led to the deletion of the following variables: INVESTMENT, REGPROX, and VCEXPERIENCE. The improved model has the following expression:

Probability of an exit route occurring over an IPO_i

$$\begin{aligned}
 &= \alpha_i + \beta_1 SYNDSIZE_i + \beta_2 REGION\ OF\ TARGET \\
 &+ \beta_3 EURONEXTRETURN_i + \beta_4 TIGHTENINGINDEX_i \\
 &+ \beta_5 INDUSTRY\ OF\ TARGET_i + \varepsilon_i
 \end{aligned}$$

According to Wald tests, in this model, all variables are significant to explain the behavior of the choice of route except for the Euronext return.

The output of the model can be found on table 6.

Table 6

Model output to improved model estimation. The coefficients for the IPO exit are not showcased since it is the base outcome for the model. *, **, *** indicate that the variable is statistically significant at the 10%, 5%, and 1% level, respectively.

	Secondary Sale		Trade Sale	
	Coefficient	P-value	Coefficient	P-value
NORTHERN	0.25	0.77	-1.68	0.21
SOUTHERN	2.39***	0.01	-0.69	0.70
WESTERN	1.59*	0.07	-2.04	0.20
MANUFAC	0.07	0.86	14.69	0.99
COMPUTER	0.76*	0.08	14.33	0.99
BIOPHARMAC	-0.94	0.29	-0.25	1.00
COMMEDIA	0.16	0.81	17.12	0.99
WHOLERETAIL	-0.86	0.17	14.57	0.99
FINANCE	-1.14*	0.08	-0.25	1.00
SYNDSIZE	-0.58***	0.00	0.20	0.17
EURONEXTRETURN	-3.99**	0.05	-0.12	0.99
TIGHTENINGINDEX	2.01**	0.03	-4.29	0.35
_cons	-0.67	0.47	-17.10	0.99

Similar to what was done for the first estimated model, now the predictive power of the model will be analyzed. The model does not seem to have a good predictive power, as it can be seen in figure 3, and table 7. The table presents the predicted probabilities (depicted as “pmlgit”), of the model. As stated before, a perfect model would present the values 0.66-1 for “pmlgit1”, 0.33-0.66 for “pmlgit2”, and 0-0.33 for “pmlgit3”. The model seems to

predict very well exits via a trade sale, but the same cannot be said for the IPO and Secondary Sale. The minimum values of pmlogit2 are a lot smaller than 0.33 (table 7), and many of the observations do not seem to be correctly predicted (figure 3). The same can be said for the IPO exit.

Figure 3

Predicted probabilities of the model. To note that Pr(IPO) represents the predicted probability of the first outcome (IPO exit), Pr(SecondarySale) refers to the predicted probability of the second outcome (Secondary Sale exit), and Pr(TradeSale) refers to the predicted probability of the third possible outcome (Trade Sale exit).

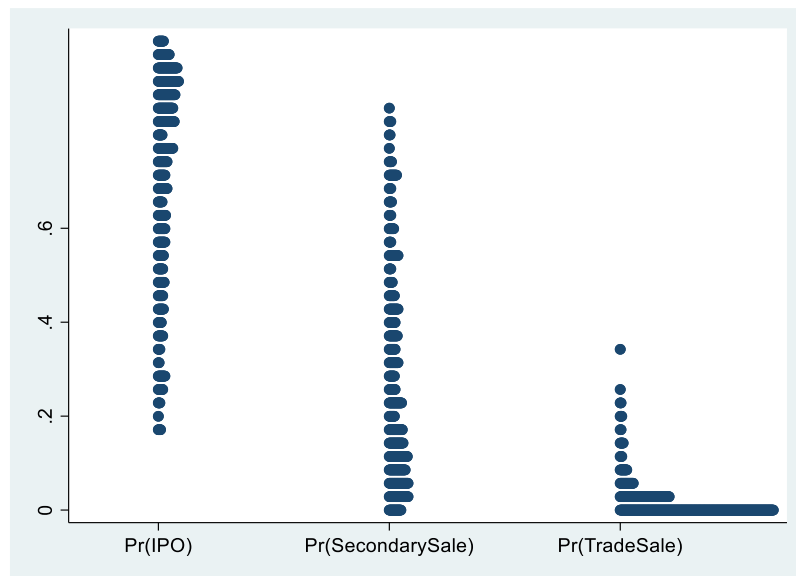


Table 7

Predicted probabilities of the improved model. To note that pmlogit1 represents the predicted probability of the first outcome (IPO exit), the pmlogit2 refers to the predicted probability of the second outcome (Secondary Sale exit), and the pmlogit3 refers to the predicted probability of the third possible outcome (Trade Sale exit).

	Obs	Min	Max
pmlogit1	329	0.1575	0.9986
pmlogit2	329	0.0002	0.8419
pmlogit3	329	3.22e-10	0.3308

6.1.3. Choice of model

The two models estimated in this report are quite different. The improved model has gone through sets of Wald and Likelihood Ratio tests which make its explanation power higher. This is corroborated by the fact that its Pseudo R-squared is higher than the one of the first model ($0.2306 > 0.2010$).

However, from the prediction standpoint the first model seems to be better than the second. The improved model has a broader interval for the predicted probabilities of each exit (as can be seen on tables 5 and 7), this is confirmed by the dispersion of these probabilities on the figures 2 and 3. Additionally, it can be inferred from the figures 2 and 3 that the improved model presents more observations which are incorrectly estimated compared to the first model.

Therefore, the choice between the two models comes down to opting between the prediction or the explanation for the exit route. The goal of this report is to explain why Ventures exit via an IPO, Trade Sale, or Secondary Sale. Hence, the goal of this report is to explain this behavior, not predict it. If the goal were to be predicting this behavior, the best course of action would be to use the first model and others in order to choose the one with the highest precision.

In conclusion, the rest of the report will use the second and improved model to answer the Research Question.

6.2. Analysis of the implications of the model

The following sub-sections will be aimed at analyzing the coefficients of the predictive model, and its average marginal effects⁸ for each of the Venture Capital exits.

⁸ The average marginal effect represents the average change in probability when an independent variable increases by one unit, *ceteris paribus*.

6.2.1. IPO exit

This analysis will include only the analysis of the model's average marginal effects, as the model's coefficients use this exit as the base outcome. These effects with the base outcome of IPO are depicted on table 8.

Table 8

Average marginal effects (depicted as dy/dx) with the predicted outcome being IPO. *, **, *** indicate that the effect is statistically significant at the 10%, 5%, and 1% level, respectively.

	dy/dx	P-value
NORTHERN	-0.0115	0.93
SOUTHERN	-0.3321**	0.02
WESTERN	-0.1983	0.12
MANUFAC	-0.2226	0.99
COMPUTER	-0.3151	0.98
BIOPHARMAC	0.1370	0.99
COMMEDIA	-0.2710	0.98
WHOLERETAIL	-0.0885	0.99
FINANCE	0.16629	0.99
SYNDSIZE	0.0795***	0.00
EURONEXTRETURN	0.5705*	0.06
TIGHTENINGINDEX	-0.2237	0.12

It appears that the statistically significant variables (for a significance level of 10%) are the ones regarding the Syndicate Size, the Euronext return, and the Southern European region.

Despite that the descriptive statistics seem to indicate that there are more IPOs happening in Northern Europe, the marginal effects seem to indicate otherwise. According to the metric, not only is it statistically insignificant for this exit route, but also if a target company is located in this region the probability of the exit being an IPO decreases by 1.15%, *ceteris paribus*. The probability of an IPO occurring also decreases if the company is in the Southern or Western European regions (*ceteris paribus*), meaning it should increase if the target is located in the Eastern region, *ceteris paribus*. This does not seem very plausible since a well-developed stock market is what permits ventures to exit through IPOs (Black & Gilson, 1998), and we can find the most developed stock markets in Western and Northern Europe. However, it

should be noted that some Eastern European markets (such as the Polish) have been more active and become more developed in the recent past. The only statistically significant region is the Southern European region, where the probability of an IPO occurring decreases (*ceteris paribus*). This is plausible since the financial markets in this region are notorious for relying more on banks.

The syndicate size, with statistical significance for the IPO exit, increases the probability of an IPO occurring – if the syndicate size increases by 1, the probability of an IPO happening goes up by 7.95% (*ceteris paribus*). This is congruent with the findings that the size of the syndicate is positively related to the probability of a successful exit (trade sales and IPOs) (Brander et al., 2002; Giot & Schwienbacher, 2007; Guler, 2007; Hege et al., 2008).

The statistically significant variable regarding stock market conditions indicates that higher stock returns are associated with a higher probability of an IPO (1 more percentage point in the returns of the Euronext Index, in the quarter before the exit, results in a 57% higher probability of an IPO, *ceteris paribus*). Which is confirmed by the positive values of the EURONEXTRETURN variable found in the descriptive analytics section. This is also in accordance with the findings of Black and Gilson (1998) who state that a well-developed stock market is what permits ventures to exit through IPOs, and of Espenlaub et al (2014) who found that the likelihood of a successful exit (M&A and IPO) is high in countries with, and at times of, high stock market liquidity.

As for the debt market conditions, although not a statistically significant variable for this exit, it appears that tighter debt markets lead to a lower likelihood of an IPO (1 more percentage point in the Tightening index results in a 22.37% lower probability of an exit via IPO, *ceteris paribus*). This is in accordance with the findings of Lerner (1994) and of Brau et al (2003), who state that unfavorable debt market conditions positively impact the probability of an IPO.

6.2.2. Secondary Sale exit

This analysis will include the analysis of the model's average marginal effects, and of the model's coefficients. The average marginal effects with the base outcome of Secondary Sale are depicted on table 9.

Table 9

Average marginal effects (depicted as dy/dx) with the predicted outcome being Secondary Sale. *, **, *** indicate that the effect is statistically significant at the 10%, 5%, and 1% level, respectively.

	dy/dx	P-value
NORTHERN	0.0446	0.73
SOUTHERN	0.3561***	0.01
WESTERN	0.2444**	0.05
MANUFAC	-0.0568	0.99
COMPUTER	0.0459	0.99
BIOPHARMAC	-0.1365	0.99
COMMEDIA	-0.0540	0.99
WHOLERETAIL	-0.1928	0.97
FINANCE	-0.1667	0.98
SYNDSIZE	-0.0859***	0.00
EURONEXTRETURN	-0.5863**	0.04
TIGHTENINGINDEX	0.3147**	0.02

According to both the average marginal effects (table 9) and the model's coefficients (table 6), the probability of a Secondary Sale occurring – or occurring instead of an IPO – is higher if the target is from the Southern and Western regions (*ceteris paribus*). These two dummy variables are also statistically significant for this exit (table 6 and 9).

As for the industry, there doesn't seem to be any statistically significant coefficients for this exit, despite that, according to descriptive statistics, more Secondary Sales happen in the manufacturing industry. However, when considering the coefficients of the predictive model (table 6), the target's industry is statistically significant if the industry is hardware and software (variable COMPUTER) or finance, insurance, and real estate (variable FINANCE). In this case, if the target is in the hardware and software industry, the probability of a Secondary Sale occurring instead of an IPO increases (*ceteris paribus*), whilst if the target works in the finance, insurance or real estate industries this probability decreases, *ceteris paribus*.

The Syndicate Size seems to be (considering the two p-values) a statistically significant variable for the Secondary Sale exit. According to the average marginal effects (table 9), a higher syndicate size decreases the probability of a Secondary Sale occurring, *ceteris paribus*. According to the model's coefficients (table 6) it also decreases the probability of a Secondary Sale happening over an IPO, *ceteris paribus*. The same is found on the descriptive statistics,

where the syndicate size appears to be the lowest syndicate in the Secondary Sale exit. These results are reasonable considering the findings on the literature stating the size of the syndicate is positively related to the probability of a successful exit (trade sales and IPOs) (Brander et al., 2002; Giot & Schwienbacher, 2007; Guler, 2007; Hege et al., 2008).

The stock market return is also a statistically significant variable for this exit. Lower stock market returns, in the quarter before the exit, lead to a higher probability of a Secondary Sale (table 9), and to a higher probability of a secondary sale over an IPO (table 6), *ceteris paribus*.

Regarding the debt market conditions, which is a statistically significant variable for the Secondary Sale exit, it seems that tighter debt market conditions lead to a higher probability of a secondary sale, *ceteris paribus*. This is congruent with the findings that favorable debt market conditions may also increase the likelihood of a secondary buy-out transaction (Axelson et al., 2013; Shivdasani et al., 2011). Tighter debt market conditions also increase the probability of a Secondary Sale occurring over an IPO (table 6), which is plausible, since according to the findings of Lerner (1994) and of Brau et al (2003) and according to the findings in table 6, IPOs are more likely to happen amongst unfavorable debt market conditions.

6.2.3. Trade Sale exit

This analysis will include the analysis of the model's average marginal effects, and of the model's coefficients. The average marginal effects with the base outcome of Trade Sale are depicted on table 10.

Table 10

Average marginal effects (depicted as dy/dx) with the predicted outcome being Trade Sale. *, **, *** indicate that the effect is statistically significant at the 10%, 5%, and 1% level, respectively.

	dy/dx	P-value
NORTHERN	-0.0332	0.21
SOUTHERN	-0.0240	0.47
WESTERN	-0.0461	0.15
MANUFAC	0.2794	0.99
COMPUTER	0.2692	0.99
BIOPHARMAC	-0.0005	1.00
COMMEDIA	0.3250	0.99
WHOLERETAIL	0.2813	0.99
FINANCE	0.0005	1.00
SYNDSIZE	0.0065**	0.04
EURONEXTRETURN	0.0159	0.90
TIGHTENINGINDEX	-0.0910	0.32

Despite that the descriptive statistics seem to indicate that there are more Trade Sales happening in Northern Europe, the marginal effects (table 10) seem to indicate otherwise. A target from the Northern, Southern or the Western Europe regions have a lower probability of exiting through a Trade Sale, *ceteris paribus*. However, it should be noted that the variables regarding the target's region do not appear to be statistically significant for this exit, neither for the probability of a trade sale occurring (table 10), nor for the probability of a trade sale occurring instead of an IPO (table 6).

The target's industry likewise does not seem to be statistically significant for the outcome of trade sale.

The descriptive statistics indicate that Trade Sales present the highest syndicate size, and it appears that – according to the average marginal effects – higher syndicate sizes lead to a higher probability of an exit via trade sale, *ceteris paribus*. The variable is also statistically significant for this outcome, strengthening this conclusion. This is congruent with the findings that the size of the syndicate is positively related to the probability of a successful exit (trade sales and IPOs) (Brander et al., 2002; Giot & Schwienbacher, 2007; Guler, 2007; Hege et al., 2008). However, whilst still positive, an increase in the syndicate size results in a small increase in the likelihood of a trade sale occurring over an IPO (the coefficient of this

variable in this outcome is close to zero). This leads one to conclude that, whilst it is an important and determining variable, a target does not require very different syndicate sizes to exit via an IPO or a Trade Sale. This is confirmed by the results of the t-test and of the Wilcoxon rank-sum test (Appendixes 2 and 3), which state that – for the syndicate size – there are only statistically significant differences in the medians and means for the observations whose exit is Secondary Sale and IPO.

The variable regarding the stock market return is not statistically significant for this exit. When considering the average marginal effects, an increase in the return of stock markets leads to a higher probability of a trade sale, *ceteris paribus*. This is in line with the findings of Espenlaub et al (2014) that the likelihood of a successful exit (M&A and IPO) is high in countries with, and at times of, high stock market liquidity. However, an increase in the stock market return results in a lower probability of a trade sale over an IPO *ceteris paribus* (table 6). This means that a higher stock market returns in the quarter before the exit, makes more likely to venture to be exited through an IPOs than a Trade Sale, *ceteris paribus*.

The debt market conditions are not statistically significant for the Trade Sale exit either. However, it appears that a tightening on the debt markets decreases the probability of a Trade Sale and that a trade sale occurring over an IPO, *ceteris paribus*.

6.2.4. Results

The analysis made with the predictive model of the report has provided some interesting results about the determinants of VC exits in Europe. This subsection aims to incorporate the literature on the subject to explain the findings provided by the model.

The Syndicate Size is a variable that seems to be of big importance for all exit routes. The results indicate that target firms with higher syndicate sizes have a higher probability of exiting through an IPO or a Trade Sale, *ceteris paribus*. This result is congruent with the findings that the size of the syndicate is positively related to the probability of a successful exit (trade sales and IPOs) (Brander et al., 2002; Giot & Schwienbacher, 2007; Guler, 2007; Hege et al., 2008). However, there doesn't seem to be a big impact of the syndicate size in the probability of a Trade Sale occurring over an IPO exit (table 6) – which is corroborated by the results of the t-test and Wilcoxon rank-sum test, which state that there is no statistical

significant difference in the medians and means of the IPO's and Trade Sale's syndicate sizes – although syndicate sizes seem to be higher in trade sale exits according to descriptive statistics. The degree of value-adding by VC firms impacts the most the Secondary Sale exit the most but in a negative relationship, as can be seen by the average marginal effect of this variable (table 8).

The stock market return in the quarter before the exit also seems to be important when deciding which exit route to take, as it is statistically significant for the IPO and Secondary Sale exits, once again impacting the Secondary Sale exit the most (tables 8 and 9). One explanation for the Trade Sale exit not to consider this variable statistically significant is the low number of this type of deals in the dataset. Higher stock market returns tend to result in a higher probability of IPOs and Trade Sales, and the opposite for Secondary Sales, *ceteris paribus*. This result is aligned with the findings by Espenlaub et al (2014) that the likelihood of a successful exit (M&A and IPO) is high in countries with, and at times of, high stock market liquidity. Additionally, the higher the stock returns the lower is the probability of a Trade Sale or a Secondary Sale occurring over an IPO, which can indicate that IPOs are more likely to occur, rather than Trade Sales and Secondary Sales, after a higher stock market returns.

Debt market conditions are mostly important for the Secondary Sale exit, where the variable is statistically significant. Tighter debt market conditions increase the probability of an exit through a Secondary Sale, while decreasing the probability of exiting through an IPO or Trade Sale *ceteris paribus* (tables 8, 9, and 10). This result has been previously discovered, stating that favorable debt market conditions may also increase the likelihood of a secondary buy-out transaction (Axelson et al., 2013; Shivdasani et al., 2011). Tighter debt market conditions also increase the probability of a Secondary Sale occurring over an IPO, which is plausible, since according to the findings of Lerner (1994) and of Brau et al (2003) and according to the findings on table 8, IPOs are more likely to happen amongst unfavorable debt market conditions.

Regarding the target's industry, this only seems to be significant in the case of a Secondary Sale. Despite more Secondary Sales happening in the manufacturing industry (according to the descriptive statistics), the target's industry is statistically significant if the industry is hardware and software (variable COMPUTER) or finance, insurance, and real estate (variable

FINANCE) (table 6). If the target is in the hardware and software industry, the probability of a Secondary Sale occurring instead of an IPO increases *ceteris paribus*, whilst if the target works in the finance, insurance, or real estate industries this probability decreases *ceteris paribus*.

As for the target's region, these are not statistically significant for the trade sale exit (table 6 and table 10), which could be explained by the low number of observations for this exit. In the case of an IPO exit, the only region that is significant is Southern Europe (table 8), where the probability of an IPO occurring decreases, *ceteris paribus*. Because the average marginal effects also present negative coefficients for the other regions, it could be inferred that the probability of an IPO occurring increases if the target is from the Eastern region *ceteris paribus*. This does not seem very consistent with previous studies, since a well-developed stock market is what permits ventures to exit through IPOs (Black & Gilson, 1998), and we can find the most developed stock markets in Western and Northern Europe. In the case of a Secondary Sale, the target's region is statistically significant if the company is from the Southern or the Western Europe, where the probability of a Secondary Sale occurring increases *ceteris paribus* (table 9), and it also increases the probability of this exit happening over an IPO *ceteris paribus* (table 6).

The effects of the Venture Capitalists' experience, Regional Proximity, and Investment were not calculated because they were not statistically significant to explain the behavior of the dependent variable according to Wald and Likelihood Ratio tests.

7. Conclusions

Through a database of 330 Venture Capital exit deals from a time period of 15 years, this report analyzed the possible determinants that could lead a target firm to exit through an IPO, trade sale, or secondary sale. This was done using a multinomial logistic model which was perfected using various rounds of statistical tests.

The results suggest that the syndicate size is the variable that most impacts the choice of the exit, affecting all exits. The higher the number of VC investors in a deal the lower the probability of the company is exited through a secondary sale, in general, and when compared to an IPO. The syndicate size positively impacts the probability of an IPO or a trade sale in general, however there doesn't seem to be a big impact of the syndicate size in the probability of a Trade Sale occurring over an IPO exit.

The empirical results indicate that the stock market return in the quarter before the exit also impacts the choice of IPO and Secondary Sale exits. Higher stock market returns tend to result in a higher probability of IPOs and trade sale, and in a lower probability of a secondary sales. Additionally, the higher the stock returns the lower is the probability of a Trade Sale or a Secondary Sale occurring over an IPO, which can indicate that IPOs are more likely to occur after a higher stock market return in the quarter before the exit.

Debt market conditions are important for the choice of a secondary sale exit. Tighter debt market conditions increase the probability of an exit through a secondary sale, while decreasing the probability of choosing an IPO or a Trade Sale. Tighter debt market conditions also increase the probability of a secondary sale occurring over an IPO.

The target's industry seems to only affect the secondary sale exit, where if the target is in the hardware and software industry, the probability of a secondary Sale occurring instead of an IPO increases, whilst if the target is from the finance, insurance, or real estate industries this probability decreases.

As for the target's region, these are not statistically significant for the trade sale exit. In the case of an IPO exit, the only region that is significant is Southern Europe, where the probability of an IPO occurring decreases. It could be inferred that the probability of an IPO occurring increases if the target is located in the Eastern region. In the case of a secondary

sale, the target's region is statistically significant if the target company is located in Southern or Western Europe, where the probability of a secondary sale occurring increases, and it also increases the probability of this exit happening over an IPO.

The VC experience, the regional proximity, and the amount invested do not impact the choice of exit.

The work of this report is inspired by previous studies of the choice and timing of exit, whereas this report contributes to the existing literature by providing insights on the exit choice itself on the European VC market. This work is not without its limitations, as the sample could include more trade sales, this could be overcome by increasing the time period of the dataset. The regional proximity of VC firm could be measured as the percentage of syndicate size, which may give more statistically significant results.

Appendix

Appendix 1

Correlation matrix

	INVEST-T	T~Coun~y	T~Region	NORTHERN	SOUTHERN	WESTERN	EASTERN	T~Indu~y	MANUFAC	COMPUTER	BIOPHA~C	COMMEDIA	WHOLER~L	FINANCE	OTHERIND
INVESTMENT	1.0000														
TargetCoun~y	0.0218	1.0000													
TargetRegion	0.1626	-0.5845	1.0000												
NORTHERN	-0.0729	0.6269	-0.7877	1.0000											
SOUTHERN	-0.0325	-0.1176	0.1430	-0.3704	1.0000										
WESTERN	0.1534	-0.5935	0.9331	-0.7734	-0.1581	1.0000									
EASTERN	-0.1221	-0.0723	-0.3314	-0.2640	-0.0540	-0.1127	1.0000								
TargetIndu~y	-0.0695	0.0643	-0.0675	0.1460	-0.0256	-0.0909	-0.1274	1.0000							
MANUFAC	-0.0394	-0.1052	0.1084	-0.1087	0.0351	0.1020	-0.0053	0.0990	1.0000						
COMPUTER	0.0505	-0.0106	-0.0942	0.0619	-0.0218	-0.0801	0.0557	-0.4873	-0.2496	1.0000					
BIOPHARMAC	-0.0982	-0.0779	0.0724	-0.1239	-0.0667	0.1227	0.1237	-0.5362	-0.1255	-0.1170	1.0000				
COMMEDIA	0.1985	-0.1001	0.2102	-0.1821	0.0227	0.2052	-0.0385	-0.3158	-0.1015	-0.0946	-0.0476	1.0000			
WHOLERETAIL	0.0392	-0.0092	-0.0187	0.0563	-0.1062	0.0080	-0.0173	0.5374	-0.1996	-0.1862	-0.0936	-0.0752	1.0000		
FINANCE	0.0735	0.1680	-0.1059	0.0409	0.1184	-0.1358	0.0466	-0.1527	-0.1930	-0.1801	-0.0905	-0.0732	-0.1440	1.0000	
OTHERIND	-0.1282	0.0732	-0.0520	0.1159	0.0048	-0.0810	-0.1149	0.4639	-0.3031	-0.2827	-0.1421	-0.1149	-0.2261	-0.2186	1.0000
SYNDSIZE	0.0556	-0.1031	0.0646	-0.0180	-0.0547	0.0734	-0.0481	-0.1490	-0.0949	0.2797	0.0752	-0.0566	0.0166	-0.1212	-0.0989
REGPROX	-0.2240	0.0051	-0.1132	0.0772	0.0200	-0.1155	0.0414	-0.0803	-0.0618	0.1266	0.0157	-0.0875	-0.0394	0.0688	-0.0475
VCEXPRIENCE	0.0166	0.0941	0.0022	0.0412	0.0016	-0.0143	-0.0738	-0.0346	-0.0642	0.0582	-0.0529	-0.0147	0.0079	0.1371	-0.0670
EURONEXTRE~N	0.0078	0.0685	-0.0669	0.1128	0.0214	-0.0969	-0.0933	0.0705	-0.0231	0.0278	-0.0635	-0.1593	-0.0044	0.0778	0.0439
TIGHTENING~X	0.2001	-0.0144	0.0592	-0.0036	-0.0283	0.0539	-0.0756	0.0470	0.0240	0.0801	-0.0505	-0.0714	0.0891	-0.0617	-0.0592
IPO	-0.0044	0.1866	-0.1591	0.1912	-0.2114	-0.0983	0.0266	0.0016	-0.0142	-0.0385	0.0556	-0.0838	0.0368	0.0920	-0.0425
TradeSale	-0.0117	-0.1303	0.0299	-0.0370	0.0861	0.0005	-0.0240	-0.0686	0.0868	0.0191	-0.0297	0.1383	-0.0473	-0.0458	-0.0718
SecondaryS~e	0.0088	-0.1487	0.1557	-0.1866	0.1903	0.1026	-0.0192	0.0227	-0.0160	0.0334	-0.0476	0.0385	-0.0216	-0.0798	0.0699
Exit	0.0004	-0.2013	0.1476	-0.1776	0.2098	0.0859	-0.0303	-0.0218	0.0381	0.0392	-0.0573	0.1141	-0.0461	-0.0937	0.0157

	SYNDSIZE	REGPROX	VCEXP~E	EURONE~N	TIGHTE~X	IPO	TradeS~e	Second~e	Exit
SYNDSIZE	1.0000								
REGPROX	0.2301	1.0000							
VCEXPRIENCE	-0.0083	-0.0659	1.0000						
EURONEXTRE~N	-0.0046	-0.0457	0.0513	1.0000					
TIGHTENING~X	0.0419	0.0129	-0.0730	0.2592	1.0000				
IPO	0.0930	-0.0423	0.0506	0.0904	-0.0372	1.0000			
TradeSale	0.0908	0.0796	-0.0416	-0.0328	-0.0554	-0.2941	1.0000		
SecondaryS~e	-0.1295	0.0159	-0.0381	-0.0828	0.0585	-0.9405	-0.0481	1.0000	
Exit	-0.0542	0.0605	-0.0565	-0.0885	0.0160	-0.9590	0.5528	0.8057	1.0000

Appendix 2

T-tests

```
. ttest INVESTMENT if Dummy1==1, by(Exit)
```

Two-sample t test with equal variances

Variable	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
IPO	233	340413	31512.38	481015.7	278326	402500
TradeSal	4	294573.7	277192.7	554385.4	-587577.1	1176725
Combined	237	339639.4	31246.69	481036.8	278081.3	401197.4
diff		45839.3	243071.3		-433037.9	524716.5

```
diff = mean(IPO) - mean(TradeSal)          t = 0.1886
H0: diff = 0                               Degrees of freedom = 235
```

```
Ha: diff < 0          Ha: diff != 0          Ha: diff > 0
Pr(T < t) = 0.5747    Pr(|T| > |t|) = 0.8506    Pr(T > t) = 0.4253
```

```
. ttest INVESTMENT if Dummy2==1, by(Exit)
```

Two-sample t test with equal variances

Variable	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
IPO	233	340413	31512.38	481015.7	278326	402500
Secondar	36	353122	96775.12	580650.7	156658	549585.9
Combined	269	342113.8	30138.83	494313.6	282774.9	401452.8
diff		-12708.96	88683.86		-187317.6	161899.7

```
diff = mean(IPO) - mean(Secondar)          t = -0.1433
H0: diff = 0                               Degrees of freedom = 267
```

```
Ha: diff < 0          Ha: diff != 0          Ha: diff > 0
Pr(T < t) = 0.4431    Pr(|T| > |t|) = 0.8862    Pr(T > t) = 0.5569
```


Appendix 3

Wilcoxon rank-sum tests

```
. ranksum INVESTMENT if Dummy1==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	233	27915	27727
TradeSale	4	288	476
Combined	237	28203	28203

```
Unadjusted variance 18484.67
Adjustment for ties -0.01
Adjusted variance 18484.66
```

```
H0: INVEST~T(Exit==IPO) = INVEST~T(Exit==TradeSale)
z = 1.383
Prob > |z| = 0.1667
```

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum INVESTMENT if Dummy2==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	233	31976	31455
SecondarySal	36	4339	4860
Combined	269	36315	36315

```
Unadjusted variance 188730.00
Adjustment for ties -0.29
Adjusted variance 188729.71
```

```
H0: INVEST~T(Exit==IPO) = INVEST~T(Exit==SecondarySale)
z = 1.199
Prob > |z| = 0.2304
```

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum SYNDSIZE if Dummy1==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	234	28156.5	28314
TradeSale	7	1004.5	847
Combined	241	29161	29161

Unadjusted variance 33033.00
Adjustment for ties -2828.21

Adjusted variance 30204.79

H0: SYNDSIZE(Exit==IPO) = SYNDSIZE(Exit==TradeSale)

z = -0.906

Prob > |z| = 0.3648

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum SYNDSIZE if Dummy2==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	234	41106	37674
SecondarySal	87	10575	14007
Combined	321	51681	51681

Unadjusted variance 546273.00
Adjustment for ties -72420.24

Adjusted variance 473852.76

H0: SYNDSIZE(Exit==IPO) = SYNDSIZE(Exit==SecondarySale)

z = 4.986

Prob > |z| = 0.0000

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.


```
. ranksum VCEXPERIENCE if Dummy1==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	235	28855	28552.5
TradeSale	7	548	850.5
Combined	242	29403	29403

Unadjusted variance 33311.25
Adjustment for ties -23.34

Adjusted variance 33287.91

H0: $VCEXPE \sim E(Exit==IPO) = VCEXPE \sim E(Exit==TradeSale)$

z = 1.658

Prob > |z| = 0.0973

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum VCEXPERIENCE if Dummy2==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	235	37911.5	37952.5
SecondarySal	87	14091.5	14050.5
Combined	322	52003	52003

Unadjusted variance 550311.25
Adjustment for ties -492.72

Adjusted variance 549818.53

H0: $VCEXPE \sim E(Exit==IPO) = VCEXPE \sim E(Exit==SecondarySale)$

z = -0.055

Prob > |z| = 0.9559

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum EURONEXTRETURN if Dummy1==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	235	28640	28552.5
TradeSale	7	763	850.5
Combined	242	29403	29403

Unadjusted variance 33311.25

Adjustment for ties -56.92

Adjusted variance 33254.33

H0: EURONE~N(Exit==IPO) = EURONE~N(Exit==TradeSale)

z = 0.480

Prob > |z| = 0.6314

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum EURONEXTRETURN if Dummy2==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	235	38625	37952.5
SecondarySal	87	13378	14050.5
Combined	322	52003	52003

Unadjusted variance 550311.25

Adjustment for ties -665.50

Adjusted variance 549645.75

H0: EURONE~N(Exit==IPO) = EURONE~N(Exit==SecondarySale)

z = 0.907

Prob > |z| = 0.3644

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

```
. ranksum TIGHTENINGINDEX if Dummy1==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	235	28725.5	28552.5
TradeSale	7	677.5	850.5
Combined	242	29403	29403

Unadjusted variance 33311.25
Adjustment for ties -77.20

Adjusted variance 33234.05

H0: TIGTE~X(Exit==IPO) = TIGTE~X(Exit==TradeSale)

z = 0.949

Prob > |z| = 0.3426

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

.

.

```
. ranksum TIGHTENINGINDEX if Dummy2==1, by(Exit)
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

Exit	Obs	Rank sum	Expected
IPO	235	36358	37952.5
SecondarySal	87	15645	14050.5
Combined	322	52003	52003

Unadjusted variance 550311.25
Adjustment for ties -963.88

Adjusted variance 549347.37

H0: TIGTE~X(Exit==IPO) = TIGTE~X(Exit==SecondarySale)

z = -2.151

Prob > |z| = 0.0315

Note: Exact p-value is not computed by default for sample sizes > 200.
Use option **exact** to compute it.

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