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Exit Strategies of Buyout Investment - An Empirical Analysis

Abstract

This study focuses on buyout exits in Europe and the United States. We analyze the three main exit routes, initial public offerings (IPOs), sales and write-offs, using a unique data set including 672 MBO and LBO investments for the time period from 1990 through 2005. We examine the strategies behind and determinants influencing the choice of an exit vehicle by employing a multinomial logit model. The results show strong support for a signaling effect: Private equity investors write off investments that turn out to be non-performing soon, showing their ability to filter out bad investments quickly. We further find evidence that exits of buyout investments tend to be driven by market sentiment, especially with regard to IPO issues. However, we could not find significant evidence that market characteristics influence the occurrence of buyout-backed IPOs. We further analyze the impact of the internal rate of return (IRR) on the chosen exit route using a multivariate regression model. We find supporting results that only the most profitable ventures are taken public.

JEL Classifications:

Keywords: Leveraged Buyouts; Private Equity; Exits; Business cycle

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1. Introduction

Although buyout investments represent a considerable proportion on the whole private equity¹ volume, so far little research has been concentrated on this area solely. This paper investigates the asset class of buyouts in detail and tries to shed light on the divestment process. Since exiting enables the realization of returns and hence is the most important factor for private equity investors, it is essential to understand the motivations behind and the determinants influencing this decision.

By using a multinomial logit model, we analyze factors affecting the choice of an exit vehicle. We consider the three main exit routes: IPOs, sales and write-offs. We find strong support for the signaling effect, implying that private equity investors tend to write-off investments that turn out to be non-performing soon. Through this strategy, they show their ability to differentiate between investments that are worth to support them further and those that are not. Although living-dead investments may exist, holding non-performing investments in hope for a turn-around is not a common strategy pursued by sophisticated investors. In addition, we find evidence that exit decisions for buyouts are also driven by the market sentiment and hence seem to be cyclical as other investments types. On the contrary, we could not find support for the influence of market characteristics on the occurrence of IPOs. Furthermore we evaluate the influence of a chosen exit vehicle on the IRR of the investment by using a multivariate regression model. We find support for the common argument that only exceptional firms are taken public. Furthermore, we show that during economic booming periods, returns are extraordinarily higher for IPOs than for sales.

The paper is organized as follows. Section I provides a theoretical overview of the investment cycle and the importance of exit strategies. Theoretical details are supported by interviews that we conducted with private equity fund managers from three different buyout funds with dissimilar investment focuses. Section II reviews the literature and provides hypotheses regarding the influence of specific variables on the choice of an exit vehicle. The data set is described in Section III. In Section IV, the analysis is performed and results are presented. They are checked for their robustness in Section V. Section VI concludes the paper.

¹ The term 'private equity' as used in this paper comprises all stages of investments where private equity capital is provided. For more detailed definitions of the various subtypes used in this paper please see Annex 1.

2. The importance of exit strategies

2.1 Characteristics of buyout investments

Buyouts are private equity investments made in established firms so they are in a mature development stage. In general, these companies are characterized by strong, sustainable cash flows, ability to generate high financial surplus and consequently, free available liquidity. Due to these characteristics, special types of exits are more common for buyouts than for other private equity segments, like early stage ventures, as will be shown later.

Usually, buyouts are classified according to their new owner structure, for instance, management buyouts/management buyins (MBOs/MBIs), employee buyouts (EBOs) or institutional buyouts (IBO). If investments are highly leveraged, they are also classified as leveraged buyouts (LBOs) in accordance with their financial structure.

Reasons for buyouts are many-sided as pointed out by Berger (1993). The ones that are mentioned regularly in literature are outsourcing of business units due to concentration on core businesses, follow-up regulations, especially in family-owned firms, sell off loss-generating units and the need for external funds. Also privatization plays a very important role in some countries as shown by Wieser, Wright and Robbie (1997).

The equity capital is usually provided by external institutional investors. As presented by Das, Jagannathan and Sarin (2002), besides their financial support, investors also provide specialized know-how, coordinate the process of leverage financing, place incentives for management and monitor the firm's development, especially with regard to cash flow patterns. These advisory functions are essential because of the usual high leverage and the risk associated with it. The investors receive the majority of shares and voting rights of the company and aim to control the company from the supervisory board. However, private equity investors in general do not intervene in the operational business.

The duration of buyout investments spans three up to five years on average. During the investment's lifetime, investors generally do not expect regular or dividend payments. They are rather interested in achieving high capital returns at the end of the investment period. Those returns, realized at the date of exit, have a huge impact on fund reputation and the ability to raise follow-on funds as will be shown below.

2.2 The life-cycle of buyout investments

Lerner (2000) and Daniels (2004) suggest that the cycle of private equity investments can be mainly divided into fundraising, investment, value-adding and divestment phases. All phases and their determinants are critical for the success of an investment. However, the exit phase is mostly regarded as the key driver as pointed out by Gompers and Lerner (2000a): “The need to ultimately exit investments shapes every aspect of the venture capital cycle, from the availability to raise capital to the types of investments that are made”.

Fundraising

To start an investment, liquidity has to be raised by choosing appropriate investors. As described by Daniels (2004), the investors should have enough financial power, a long-term investment horizon and a suitable risk preference. On the other side, investors also have special criteria for selecting a fund as pointed out by Black and Gilson (1998). Those criteria are based on the fund's underlying strategies and the fund's track record. According to Yrkkö et al. (2001) among others, the latter is regarded as the key factor for the acquisition of capital. Thus, successful exits in the past seem to have strong influence on the ability to raise follow-on funds and thus are of major importance.

Investment phase

Appropriate investment targets are selected during the second phase. Private equity firms with a good reputation and extensive network in the financial sector are mostly in favor of having access to a large and high quality portfolio of target companies. They use the process of screening, due diligence and valuation to select appropriate investments. Afterwards, they structure the deal whereby they intensely consider exit opportunities as well. The importance of exit considerations during this phase is also described by Schwienbacher (2002) and Daniels (2004). Additionally this approach is supported by comments we obtained from interviews with private equity fund managers.

Value-adding phase

The value-adding phase is a key process in a private equity investment. During this phase, private equity funds contribute to the success of an investment by providing know-how, offering informal advice and their extensive network. They also provide reputational capital that gives their target companies credibility as pointed out by Black and Gilson (1998). Furthermore, Cumming and MacIntosh (2002) show that they also participate in strategic decisions, which enables them to restructure and monitor their target companies. This demonstrates the importance of management know-how and why investors pay special attention to the funds' track record in their selection process.

Divestment phase

As shown above, exit strategies are considered by private equity funds quite early in the investment process because they allow the liquidation of tied-up funds and hence the realization of returns, which is the most important goal for investors. This argument is also supported by Black and Gilson (1998) who pointed out that exits are a critical component because they play a central role for the fund's accountability to capital providers. In general, there are several possibilities for an exit but the decision is often quite a complicated matter. This is because it depends on a variety of factors that can change over time. Besides the profit that can be realized at the date of exit, factors like the company size, managers' goals and the current market environment have to be considered as well. As shown by Yrkkö et al. (2001) who analyzed exit opportunities in Finland, market characteristics play an important role.

2.3 Exit channels

The divestment phase is crucial for the overall performance of an investment as pointed out above. In addition to the systematic factors already mentioned, strategic decisions like the timing or the type of exit vehicle have to be considered carefully, too. In this section, we give a brief overview of the different exit opportunities by considering the particularities of buyout investments. However, due to restrictions in empirical data and the fact that numerous subtypes of these categories can be created, only the most important ones namely initial public offerings, sales and write-offs are considered and discussed below.

IPO

Schwienbacher (2002) pointed out that IPOs are an exit channel for highly profitable portfolio companies, consistent with general argument. Such high-flyers are characterized by a convincing equity story and high growth prospects. The latter indicates that since buyouts are in a mature development stage, the probability of exiting via IPO should generally be smaller compared to other private equity investments. This is supported by Das, Jagannathan and Sarin (2001) who discovered that the probability of an IPO decreases by moving from early to later stage investments, the smallest for buyouts implying that those firms are more likely to be sold. A sub-category of buyout-backed IPOs are reverse LBOs² that were analyzed in more detail by Cao and Lerner (2006).

Sale

Sales can be subdivided into trade sales (also referred to as acquisitions), secondary sales and buybacks. As shown by Cumming and MacIntosh (2002), trade sale, where the portfolio company is

² Prior public companies that have been subject to leveraged buyouts (LBOs) and now are again returned to the public equity market are referred to as reverse LBOs.

sold to a strategic investor, is regarded as the most used exit vehicle and the most profitable among all types of sales. Secondary sales (sales to other institutional investors) and buybacks (repurchases by the old owner or management) are most often associated with lower returns and are less preferred according to Daniels (2004) and Natter (2003). In recent years, however, the preference for secondary buyouts increased significantly as pointed out by Wright et al. (2006). The general advantages of sales often mentioned in literature, e.g. by Daniels (2004), are fast exit opportunities, less restrictions compared to IPOs and the possibility to influence the investment according to the needs of strategic investors.

Write-off

Private equity firms generally try to minimize their portfolio failure ratio because of its negative effect on performance and reputation. Nevertheless, underperforming investments occur and have to be written-down or written off sooner or later. Thus, this exit channel should be regarded as a constraint rather than an option. The interesting question is how fund managers treat these investments and how long it takes until they decide to drop them out of their portfolio. In their analysis, Cumming and MacIntosh (2002) discovered interesting differences between U.S. and Canadian ventures in the handling of those investments illustrated in more detail below.

3. Literature review and hypotheses

3.1 Overview

Despite their increasing importance, buyouts have been studied in detail very much. Existing studies have taken only a partial view on this segment, leaving much space for further research. Many of the studies so far investigate agency theoretical implications. For example, Thompson and Wright (1991) analyzed monitoring and incentive devices on a large sample of U.K. buyouts. Their results showed that the choice of control strategies is clearly influenced by financing arrangements. Another study performed by Nikoskelainen and Wright (2005) revealed that value increase and return characteristics in LBOs are a result of corporate governance mechanisms and found evidence for the free cash flow theory developed by Jensen (1986)³. Their study was based on a set of 321 hand-collected U.K. LBOs that were exited between 1995 and 2004. In detail, the authors found a positive relationship between the value increase and the management ownership, the number of participants in the equity syndicate and the leverage and debt coverage.

³ This theory supports the positive role of leverage financing as motivation and controlling instrument. It is shown that through an LBO agency costs can be reduced and the operating efficiency can be improved leading to an increase in firm value.

Other studies like the one presented by Groh and Gottschalg (2006) focused on the investigation of buyout performance. By analyzing the risk-adjusted performance of U.S. buyouts, they showed that this asset class visibly outperformed the market benchmark. Similar results are also found by Ick (2006) who investigated the risk and return relationship of private market equity relative to public market equity. He found private equity returns to be highly variable across the different stages whereby later stage investments achieved higher risk adjusted returns.

As stated by Giot and Schwenbacher (2005), so far little research has focused on the various exit vehicles of private equity investments, their determinants and their interaction with each other. Das, Jagannathan and Sarin (2002) among others examined the exits of U.S. venture and buyout funds by estimating the probability of various exit routes. They found high cross-sectional variations in the probability of an exit across different stages, industries, the financing amount and existing market conditions. For the buyout stage, the probability of an exit via sale was the highest.

3.2 Investment duration and exit strategy

There seems to be a connection between the duration of an investment and different exit strategies. One strategy in this context is described by the 'grandstanding hypothesis' that was first introduced by Gompers (1996). It indicates that younger venture capital funds exit their investment prematurely and preferably via IPO in attempt to build reputation. Yrkkö et al. (2001), who studied the exit behavior of venture capital funds in Finland and analyzed factors influencing the length of the investment, also supported this hypothesis.

Another exit strategy related to the holding period is presented by Kreuter, Gottschalg and Zollo (2005), who distinguished between "buy-and-flip" and "buy-and-grow" approaches. "Buy-and-flip" argues that most of the value creation in a buyout occurs upfront. Thus, reselling the portfolio company rapidly will lead to a maximization of realized returns. "Buy-and-grow" suggests that higher returns are achieved mainly by adding real value to the investment target. It is only possible over time but exiting then results in higher proceeds.

A current study presented by Cao and Lerner (2006) gives ambiguous results for the theory of value creation in investments. By investigating the performance of U.S. reverse LBOs between 1980 and 2002, they found that portfolio companies that were kept for shorter than the median investment duration performed slightly better than those held for longer. Additionally, they investigated investments that were exited within one year, referred to as "quick flips", and found that they have underperformed the market whereas other reverse LBOs have outperformed the market. However, this difference was not statistically significant, thus providing weak support for their thesis.

Cumming and MacIntosh (2002) support the strategy claiming that adding value is only possible over time. They argue that sophisticated private equity investors can clearly distinguish between good and bad investments, adding value only to the former. Hence the duration of an investment can be considered as a signal of the firm's quality. Therefore, they suggested that the longer the holding period, the higher the probability of IPOs (given the fact that an IPO is regarded as an exit channel for high-flyers) followed by secondary sales, acquisitions, buybacks and write-offs. Most of their results did not show strong evidence of their hypothesis. But they found strong support for the signaling effect with regard to write-offs. Their results show that a shorter holding period is associated with an increased probability of a written off. This is in line with their argument that private equity (PE) investors will not stick to low quality portfolio companies as that would signal their inability to differentiate between good and bad investments. The authors argue that a strategy supporting the maintenance of living-dead investments in the portfolio would in the long run signal the inability of the fund's management to create value through active participation. Nevertheless, few living-dead investments in portfolios seem to exist and revealed interesting differences in the regional treatment of such investments. In the U.S., a write-off tends to happen more frequently than in Canada, where it seems to be that some poorly performing investments are exited by being bought back than being written off.

Cumming (2002) also provided supporting findings that write-offs occur quickly. He analyzed the probability of different exit vehicles of European venture capital funds with respect to their firm characteristics and their contractual agreements with the venture capital fund. With regard to the holding period, he found that the probability of a write-off is highest for short term investments. He explained his findings with the fact that disadvantageous information is generally exposed rapidly during the investment process.

In line with the value adding thesis, different studies show that investments not worth to further commitment and effort seem to be quickly written off instead of being hold as living-dead investments. This process signals the PE investor's ability to identify investments that turn out to be non-performing soon. Based on these findings and the information we obtained during the interviews, we therefore state:

Hypothesis 1: *Write-offs are more likely in shorter holding periods compared to IPOs and sales*

3.3 The impact of market conditions

The general market environment seems to have great influence on the decision to exit private equity investments. Several studies analyzed this assumption using different approaches and proxies, e.g. stock valuation levels, the market's overall liquidity and variables that proxy boom periods.

Giot and Schwiendbacher (2005) argued that the decision to exit an investment has two dimensions, the type of exit and the timing. They used competing risks models to model the timing of exits and found that each type of exit has its own dynamics. This is also the case for different industry categories, with biotechnology and internet firms being the fastest in exiting via IPO and internet firms also being the fastest written offs. They also analyzed the effect of the bubble period and found that exits during the bubble period speeded up.

Cumming and MacIntosh (2002) analyzed determinants influencing the decision on full and partial exits of venture capital investments in the U.S. and Canada. They investigated the full range of exit vehicles including IPOs, acquisitions, secondary sales, buybacks and write-offs. They found market conditions to noticeably affect the extent of IPO exits in the U.S. sample.

Ritter and Welch (2002) reviewed the theory and results of economic research on IPO activity. In detail, they analyzed determinants for going public, reasons for the phenomenon of under-pricing and the long-run performance of IPOs. In general, they argued that asymmetric information theory does not explain the high volatility of IPO activity. Instead, non-rational explanations seem to be more appropriate. They found the most interesting unanswered question to be why a downward adjustment in the numbers of IPO issues takes place after a stock market crash, instead of a price adjustment. As an overall result of their review, they found stock market conditions to be the predominant factor for the decision to go public.

Gompers and Lerner (2000a) analyzed the private and public financings of venture-backed, privately held biotechnology firms. They showed that firms are taken public by venture capitalists at high valuation levels (market peaks). They also found that experienced venture capitalists are more successful in timing their exits.

As shown by various studies using different approaches, the stock market environment seems to influence PE investments and their exit opportunities. In accordance with general findings that a favorable stock market climate drives exit decision toward IPOs, we suggest the following:

Hypothesis 2: *A favorable stock market climate increases the probability of an exit via IPO.*

3.4 The influence of market characteristics

As mentioned above, the divestment phase has high impact on the earlier stages of the investments life-cycle. Good and stable exit opportunities on markets are, therefore, crucial to successful exits and building reputation as pointed out by Lerner (2000). Nevertheless, reality does not always meet these preferences. Additionally, there are differences between various regional public markets that influence exit decisions.

Yrkkö et al. (2001) analyzed the attractiveness of the Finnish market for private equity exits. In addition to stock market conditions of particular interest for younger venture capital funds, they also analyzed the M&A market and the correlation of both markets with each other. They found the M&A market to be quite active and stable, thereby enabling constant exit opportunities for PE investors. On the contrary, the IPO market seems to be characterized by high volatility, making an IPO rather unattractive. With regard to the interaction of both markets with each other, they found that they are imperfect substitutes and that the M&A market lags behind the development of the stock market.

Cumming and MacIntosh (2002), who analyzed partial and full exits on the U.S. and Canadian market, discovered that regulatory differences have an influence on the frequency of using particular exit channels. In detail, they detected that IPOs are less frequently used by Canadian venture capitalists than by U.S. investors.

Manigart et al. (2002) analyzed determinants of venture capital returns based on a five-country study. They argued that each market has its own characteristics and hence distinct impact on the venture capital business. Special attention is pointed at the difference between Anglo-American and European countries as the former are regarded as more developed. Their results support this argument as they show that required returns (implying a greater involvement of the venture capitalist) in the U.S. and UK are higher than those in other European countries.

Cumming (2002) analyzed the impact of contractual terms on the choice of exit routes. By analyzing a hand-collected sample of European venture capital funds, he revealed that the probability of an IPO increases by using common equity as well as a greater number of incentive contingencies in the contracts. For European VCs, because of the market structure (shown by Black and Gilson (1998) with the German market) are more likely to use covenants with veto and control rights, an IPO should be less likely on those markets. For a detailed review of the differences between European and U.S. IPO markets, see also Ritter (2003).

Schwienbacher (2002) analyzed differences between the European and U.S. venture capital markets. Despite many similarities, he found important differences for the exit stage in the two markets. He revealed that Europe investors face less liquid markets with regard to human resources (e.g. the possibility to replace key employees) as well as exit opportunities than U.S. investors. Hence, making an exit more complicated.

Based on the facts that U.S. markets are more stock market-centered and that the stock market there is more developed, this paper argues:

Hypothesis 3: *In the U.S. market the probability for a buyout-backed IPO is higher than in European stock markets.*

3.5 IPO as an exit channel for high-flyers

As pointed out by Giot and Schwienbacher (2005), in academic literature, an IPO is widely regarded as the most profitable exit route among private equity investments whereas trade sales are more common. In their study, they modeled the time to different exits via a competing risk model and showed that the probability of an exit via an IPO is very high at the beginning of the measurement and decreases rapidly as time goes by whereas the probability of a trade sale exit is more stable over time. Therefore, they conclude the order of preference for exit types whereas investors prefer an IPO followed by a trade sale and write-off.

Schwienbacher (2002) also argued that the increasing profitability of an IPO is because of the selection bias caused by the fact that only extraordinary firms are taken public. In a questionnaire sent to venture capitalists in six different European countries, they asked for the degree of importance of various factors (e.g. quality of the management, expected future profitability) influencing the decision to exit via IPO or sale. Their results showed that respondents valued these factors higher for IPOs, supporting their thesis that only outstanding firms are taken public.

Cumming and MacIntosh (2003) analyzed determinants influencing the decision of full and partial exits in Canada and the U.S. based on five different exit vehicles. They showed that exits via IPOs or acquisitions are the most profitable followed by secondary sales, buybacks and finally, write-offs for the lowest quality firms. However, they found differences between full and partial exits with regard to the average annual return and the variance of these returns.

Furthermore Fenn, Liang and Prowse (1997) argued that investing in periods with high capital commitment may be lucrative although in such periods returns seem to be lower⁴. They found a possible explanation for this behavior in the presence of favorable exit opportunities. Due to high valuation levels during boom periods and the possibility to achieve higher returns for earlier ventures, capital commitment may be triggered. They referred to a study performed by Venture Economics during 1970 and 1982, which showed that IPOs significantly outperformed sales with realized gains being five times higher.

Nikoskelainen and Wright (2005) examined the IRR of enterprise value and the IRR of invested equity for 321 U.K. buyouts exited between 1995 and 2004. In detail, they analyzed the relationship between the corporate governance structure and the likelihood of a positive return at the realization date of the investment. The result revealed that IPOs clearly outperformed trade sales and secondary buyouts.

Because IPO are mainly regarded as an exit option for highly profitable ventures, our study suggests:

Hypothesis 4: *An exit via IPO has a positive effect on realized returns.*

4. Data

4.1 Overview of dataset

The data for the present study was provided from CEPRES (Center of Private Equity Research), a company that offers research-based consulting services in the PE industry. CEPRES was founded in 2001 as a co-operation between VCM Capital Management GmbH (www.vcm.de), an international operating PE firm with more than 15 years of experience, and the Chair of Banking and Finance at the Johann Wolfgang Goethe-University of Frankfurt am Main (www.finance.uni-frankfurt.de). The data is derived from the records of CEPRES' Private Equity Analyzer, a unique database that includes highly detailed information. The database contains precise facts about over 13,500 investments worldwide ranging from early to later stage. In particular, the data incorporates detailed cash flow information on the investment level rather than on the aggregated fund level like most other databases. The information is obtained from due diligence and monitoring reports and is included anonymously to meet the high confidentiality requirements of the private equity industry. Cash flows are reported on a gross basis, i.e. unadjusted for management fees, carried interests and other fund-related costs and are thus unbiased by any externalities. The detailed information about the amount and date of all cash

⁴ They argue that low returns in boom periods are due to tough competition and the fact that deals are closed quickly, leaving less time for carefully due diligence and deal structuring. They also state that the presence of less experienced PE investors is higher in boom periods. In general their argument supports the 'money-chasing deal argument' presented by Gompers and Lerner (2000b).

flows to and from the PE investments further enables us to accurately measure the IRR per investment. Due to the fact that those IRRs are reported on a gross basis, they seem to be quite high compared to IRRs reported by other funds. According to Schmidt, Nowak and Knigge (2004) who performed a separate analysis of 80 PE funds (raised in vintage years between 1971 and 1998 and where net and gross information were available from CEPRES) net IRRs were, on average, 45% lower than gross IRRs.

Due to confidentiality reasons, we obtained an excerpt of the CEPRES database. The data was restricted to buyouts, namely MBOs/MBIs and LBOs, where information about the way of exit was given. We concentrate on completely liquidated investments, i.e. only fully realized investments and written offs. Although a possible bias could arise by excluding write-downs, it allows an accurate classification of non-performing investments. Types of exit vehicles in the data sample consist of four categories "realized-IPO", "realized-sale", "realized-public merger/sale" and "write-off". However, due to the similarity and the small number of observations, the exit category "realized-public merger/sale", is merged with the category "realized-sales".

In addition, some macroeconomic variables from external sources are also incorporated and merged with the CEPRES data to perform the analysis. To proxy the public and private market environment, we use information on IPO issues and M&A deals obtained from Thomson Research. To proxy the economic activity, we further use the CFNAI (Chicago Fed National Activity Index) and the EuroCOIN Index. Both indices are based on an extension of the methodology used to construct the original Stock-Watson XCI⁵. The CFNAI is a weighted average of 85 existing monthly indicators of national economic activities in the U.S.. It is constructed to have an average value of zero; thus a positive index corresponds to growth above trend and a negative index corresponds to growth below trend. The EuroCOIN Index, provided by the Centre of Economic Policy Research (CEPR), is the leading real-time business cycle indicator for the Euro area. The indicator provides an estimate of the monthly growth of Euro area GDP after the removal of measurement errors, seasonal and other short-run fluctuations. As reported by CEPR, the quarterly growth rate of the GDP averaged 0.59 over the sample period (1988-2003). Thus, a value of the EuroCOIN Index exceeding 0.59 indicates a growth above trend whereas an index value below 0.59 indicates, if positive, a growth below trend. Similar to earlier research, e.g. Steffen (2007), we define a boom period when both indices are above their trend for at least four consecutive quarters. As a result, we found the following periods to be boom phases: 1994Q2 through 1994Q4, 1997Q2 through 1998Q1 and 1999Q2 through 2000Q1.

⁵ The Stock-Watson XCI was one of the most leading coincident indicators for the U.S. economic activity until 2003. It was developed by James Stock of Harvard University and Mark Watson of Princeton University in an article "Forecasting Inflation", published in the Journal of Monetary Economics 44, 293-335 in 1999.

The data sample consists of 888 observations altogether from different parts of the world with a strong focus on European and U.S. investments. Non-European and non-U.S. investments were then deleted reducing the sample down to 871 observations. Because of missing values in the dataset, observations were further reduced to the final number of 672 multinomial regression model. To perform the OLS regression, the IRR was included. Because of missing IRR values, the number of observations reduced then to 666. Since we further exclude investments that were written off to perform the OLS regression, the final number of observations is 567.

4.2 Descriptive statistics

An overview of all variables used in this study and their definition is provided in Table 1.

VARIABLES	DEFINITION
Data at the investment level	
AGE	Age of the private equity company at the investment date.
EXPERIENCE	Dummy variable equal to one if the portfolio company does not belong to a first-time fund.
HIGHTECH	Dummy variable equal to one if the target company belongs to one of the following industry segments ⁶ : Healthcare & Other, Information Technology and Communications.
HOLDING PERIOD	Investment duration in years.
IPO	Dummy variable equal to one if the investment goes public.
IRR	Exact internal rate of return (gross) based on investment cash flows from the fund to the portfolio company and return flow from the company to the fund.
SALE	Dummy variable equal to one if the investment is sold.
USA	Dummy variable equal to one if the investment was made in the U.S..
WRITE-OFF	Dummy variable equal to one if the investment is written off.
Macro economic data	

⁶ The 27 industry classifications provided by CEPRES were aggregated to the following industry segments: **Financial Business Services**: Financial Services, Business Services, Fund of Fund Investments; **Consumer Discretionary**: Consumer Industry/Food, Hotel, Leisure, Retail, Textiles; **Healthcare & Other**: Healthcare/Life Sciences; **Industrial Production**: Construction, Industrial/ Manufacturing, Traditional Products, **Information Technology**: High Tech, IT, Semiconductor, Software; **Communication**: Internet, Media, Telecom; **Materials**: Materials, Natural Resources/ Energy; **Services**: Environment, Logistics, Transportation, Waste/ Recycling, Other Services; **Others**.

BOOM	Dummy variable equal to one if the EuroCOIN index and the CFNAI were at least four quarters above their long term average.
COMCAP	Committed capital to the overall market at the exit date of the investment measured in \$10,000.
HOTISSUE	Dummy variable for the heyday of the New Economy Boom equal to one if the investment was exited in the year 1999 or 2000.
INRATE	Risk free interest rate at the date the investment was made.
NO.OF IPO ISSUES	Annual number of worldwide IPOs measured in 1,000.
NO.OF M&A DEALS	Annual number of worldwide M&A deals measured in 1,000.
VCBOOM	Dummy variable equal to one if the number of worldwide private equity-backed IPOs exceeds their average value (1990-2004).
VOL.OF M&A DEALS	Proceeds of the worldwide M&A deals measured in \$10,000.

Table 1: Definition of variables

The number of observations after the exclusion of missing values account for 672 and 666 respectively, spanning an investment period of 16 years, from 1990 through 2005. Table 2 presents the descriptive statistics for the data sample.

	IPO		Sale		Write-off		Total
	No.	%	No.	%	No.	%	
Total	117	0.17	456	0.68	99	0.15	672
Country							
USA	21	0.16	71	0.53	42	0.31	134
Europe	96	0.18	385	0.72	57	0.11	538
<i>Belgium</i>	1		1		0		2
<i>Denmark</i>	1		2		1		4
<i>Finland</i>	10		42		1		53
<i>France</i>	7		49		12		68
<i>Germany</i>	5		13		10		28
<i>Ireland</i>	0		2		1		3
<i>Italy</i>	2		9		2		13
<i>Netherland</i>	3		15		1		19
<i>Poland</i>	0		4		0		4
<i>Portugal</i>	0		0		1		1
<i>Spain</i>	4		22		3		29
<i>Sweden</i>	6		12		0		18
<i>Switzerland</i>	3		2		0		5
<i>UK</i>	54		212		25		291

Buyout sub-segment								
MBO	97	0.17	409	0.70	80	0.14	586	
LBO	20	0.23	47	0.55	19	0.22	86	
Industry segment								
Financial & Business Services	3	0.13	19	0.79	2	0.08	24	
Consumer Discretionary	24	0.16	104	0.69	23	0.15	151	
Healthcare & Other	10	0.31	19	0.59	3	0.09	32	
Industrial Production	37	0.18	147	0.70	27	0.13	211	
Information Technology	15	0.29	28	0.54	9	0.17	52	
Communication	5	0.13	25	0.64	9	0.23	39	
Materials	8	0.32	11	0.44	6	0.24	25	
Services	10	0.11	64	0.72	15	0.17	89	
Others	5	0.10	39	0.80	5	0.10	49	

Table2, Panel A: Frequency of exit channels

The following table summarizes the statistics of the investment's duration that is measured in years.

HOLDING PERIOD

No. of observations	672	
Minimum value	0.0027	
Maximum value	15.6795	
Mean	4.0903	
Std. Dev.	2.4802	
Variance	6.1512	
Skewness	0.9375	
Kurtosis	4.5444	
Percentiles		
	1%	0.0822
	5%	0.6685
	10%	1.1699
	25%	2.3027
	50%	3.7507
	75%	5.5068
	90%	7.2575

95% 8.6712

99% 11.1425

Table 2, Panel B: Summary statistics of the holding period

The IRR calculations are based on gross cash flows that are on average 45% higher than their corresponding net values. The lower number of observations (666) is due to missing values in the reported IRRs. Statistics on the IRR are presented in general, for each exit channel and for each industry segment⁷.

INTERNAL RATE OF RETURN (IRR)					
No. of observations	666				
Mean	37.6045				
Median	29.1				
Std. Dev.	115.34				
Variance	13303.96				
Skewness	4.05				
Kurtosis	35.41				
	Obs	Mean	Std. Dev.	Min	Max
Exit channel					
IPO	116	111.1136	141.8845	-13.39	1287.6
Sale	451	48.90337	93.9631	-100	900.62
Write-off	99	-100	0	-100	-100
	666				
Industry Segment					
Financial & Business Services	23	34.85	64.59	100.00	185.93
Consumer Discretionary	148	26.01	127.22	100.00	1287.60
Healthcare & Other	32	34.87	72.97	100.00	239.20
Industrial Production	209	28.80	81.64	100.00	403.63
Information Technology	52	77.04	126.14	100.00	407.27
Communication	39	42.66	163.73	100.00	885.04

⁷ The 27 industry classifications provided by CEPRES were aggregated to the following industry segments: **Financial Business Services**: Financial Services, Business Services, Fund of Fund Investments; **Consumer Discretionary**: Consumer Industry/Food, Hotel, Leisure, Retail, Textiles; **Healthcare & Other**: Healthcare/Life Sciences; **Industrial Production**: Construction, Industrial/ Manufacturing, Traditional Products; **Information Technology**: High Tech, IT, Semiconductor, Software; **Communication**: Internet, Media, Telecom; **Materials**: Materials, Natural Resources/ Energy; **Services**: Environment, Logistics, Transportation, Waste/ Recycling, Other Services; **Others**.

Materials	25	37.70	125.38	100.00	435.43
Services	89	52.31	152.66	100.00	900.62
Others	49	40.64	94.47	100.00	451.25
	666				

Table 2, Panel C: Descriptive statistics IRR

Panel A in Table 2 reports the frequency of exit vehicles within the data sample. Overall, the most used exit vehicle is sale, followed by IPO and finally write-off. After splitting the data into European and U.S. investments, differences are evident. Although sales are the most common exit channel in both sub-samples, the proportion of IPOs and write-offs changes, with write-offs being the dominant factor in the U.S. accounting for 31%. Additionally, the data shows a bias toward European investments, which account for 538 observations compared to 134 U.S. observations. The rows underneath the European allocation shed more light on the European distribution. It can be seen that UK investments dominate the sub-sample followed by French, Finnish, German and Spanish investments. Overall, the proportions reflect the appropriate sizes of the European private equity market. Panel A further reports the occurrences of exit channels by industry segment⁸. Consumer Discretionary and Industrial Production are by far the largest segments, together making up more than 54% of all investments. Looking deeper into the proportion of each industry segment per exit channel, we see that for all segments, sale is the most common exit vehicle and IPO is second after sale. Figure 2 presents the frequency of each exit vehicle over time.

⁸ The 27 industry classifications provided by CEPRES were aggregated to the following industry segments: **Financial Business Services**: Financial Services, Business Services, Fund of Fund Investments; **Consumer Discretionary**: Consumer Industry/Food, Hotel, Leisure, Retail, Textiles; **Healthcare & Other**: Healthcare/Life Sciences; **Industrial Production**: Construction, Industrial/ Manufacturing, Traditional Products, **Information Technology**: High Tech, IT, Semiconductor, Software; **Communication**: Internet, Media, Telecom; **Materials**: Materials, Natural Resources/ Energy; **Services**: Environment, Logistics, Transportation, Waste/ Recycling, Other Services; **Others**.

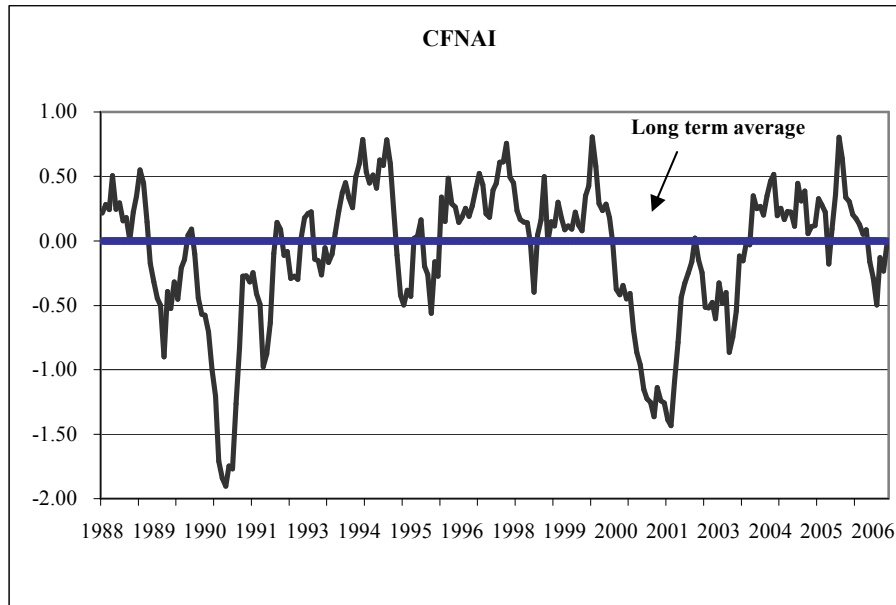


Figure 1: Chicago Fed National Activity Index (CFNAI).

The CFNAI is a weighted average of 85 existing monthly indicators of national economic activity in the U.S. It is constructed to have an average value of zero thus a positive index corresponds to growth above trend and a negative index corresponds to growth below trend.

Across all years, sale is the predominant exit vehicle. It can be seen that its proportion compared to IPOs has grown over time, especially since the second half of the 1990s. This can be explained by the development of the European private equity market that reached its largest growth rates during that time. Furthermore, the figure reveals that changes in IPOs and sales do not seem to be strongly correlated. Especially during the New Economy Boom, the number of sales seemed to be more influenced than the number of IPOs. By investigating the data sample by region, we found that in the U.S. sub- sample, no entry is made for an IPO in 1999, the heyday of the New Economy Boom, indicating the limitations of the current data sample in simulating reality due to missing values.

Table 2, Panel B lists the statistics of the holding period of the investments. Investments are held for about four years on average. This is the case for investments exited via IPO, sale and MBOs/MBIs and LBOs. Differences are only evident for write-offs, for which average holding period is two years. Overall, the shortest investments are exited right at the beginning whereas the longest duration spans almost 16 years.

Summary statistics on the internal rate of return (IRR) is provided in Table 2, Panel C. The IRR measures the average annual return based on gross cash flow payments and is thus not affected by individually charged fees and costs. As investments analyzed herein are fully realized, the IRR can be calculated exactly and is not an interim reported measure. Due to missing values, the data sample is

restricted to the number of 666 observations. Overall, the sample generates a median IRR of 29% and a mean of 38%. This is in line with calculations by Knigge, Nowak and Schmidt (2004) who calculated a mean gross IRR of 39% for buyouts in their sample. Returns for IPOs range from -13% to 1,287%, achieving a mean of 111%. With a median of 70%, it seems that outliers bias the overall IRR upward. Sales range from -100% to 900%, generating a mean of 49% and a median of 31%. There is also an upward bias though not as strong. Among all exit channels, IPOs have the highest IRR values, indicating that these exits are more profitable. In terms of industries, the highest average return is achieved in the Information Technology sector followed by Services and Communication. The lowest returns are achieved for Consumer Discretionary, Materials and Industrial Production. Figure 2 shows the average distribution of exits over time.

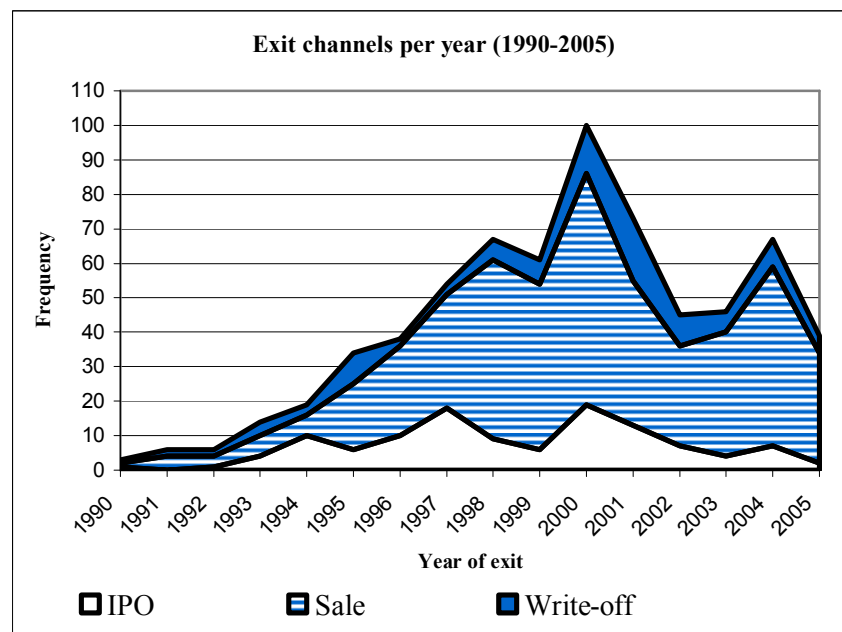


Figure 2: Frequency of exits channels over time (1990-2005)

This graph shows the annual frequency of exit channels, whereby the frequency is indicated through the area between the upper and lower graph and x-axis respectively.

It can be seen that the average returns in the sample correspond to general market movements, reaching their highest values during the boom phases in the early 1990s and in the New Economy Boom.

5. Description of analyses and interpretation of results

5.1 Methodology

Multinomial logit model (MNL model)

When the dependent variable is discrete, linear regression models are not appropriate because basic assumptions of the model are violated as shown by Wooldridge (2006) and Verbeek (2000). Therefore, we use the multinomial logit (MNL) approach to analyze determinants influencing the choice of an exit vehicle. For a more detailed discussion of the model and its diagnostic, please refer to the Technical Appendix in Annex 3.

Within this study, we use the following three dependent variables:

- I - initial public offering (IPO)
- S - sale
- W - write-off,

where sale is used as the reference category as it includes the most observations. Thus, formally the model consists of two equations with $\ln \Omega$, the logarithm of the appropriate odds (also called logits), X represents the vector of independent variables presented in more detail below, \Pr is the estimated probability for the success of the respective outcome category and β is the vector of the estimated coefficients.

$$(1) \quad \ln \Omega_{I|S}(x) = \ln \frac{\Pr(y = I|x)}{\Pr(y = S|x)} = x\beta_{I|S}$$

$$(2) \quad \ln \Omega_{W|S}(x) = \ln \frac{\Pr(y = W|x)}{\Pr(y = S|x)} = x\beta_{W|S}$$

$$\text{with } \Pr(y = I/x) = \frac{\exp(x\beta_{I|S})}{1 + \exp(x\beta_{I|S}) + \exp(x\beta_{W|S})}$$

$$\Pr(y = S/x) = \frac{1}{1 + \exp(x\beta_{I|S}) + \exp(x\beta_{W|S})}$$

$$\Pr(y = W/x) = \frac{\exp(x\beta_{W|S})}{1 + \exp(x\beta_{I|S}) + \exp(x\beta_{W|S})}$$

Independent variables incorporate the private equity firm's experience, investment characteristics as well as macroeconomic factors. Including them in the equations above, the following linear models are constructed:

$$(1) \ln\Omega_{I/S}(x_i) = \beta_0 + \beta_{1,I/S}AGE + \beta_{2,I/S}USA + \beta_{3,I/S}HOLDING PERIOD \\ + \beta_{4,I/S}NO.OF IPO ISSUES + \beta_{5,I/S}NO.OF M \& A DEALS \\ + \beta_{6,I/S}BOOM + \beta_{7,I/S}HIGHTECH$$

$$(2) \ln\Omega_{W/S}(x_i) = \beta_0 + \beta_{1,W/S}AGE + \beta_{2,W/S}USA + \beta_{3,W/S}HOLDING PERIOD \\ + \beta_{4,W/S}NO.OF IPO ISSUES + \beta_{5,W/S}NO.OF M \& A DEALS \\ + \beta_{6,W/S}BOOM + \beta_{7,W/S}HIGHTECH$$

AGE is the age of the private equity firm at the date the investment started and is included as a proxy for the fund management's experience. USA is a dummy variable equal to one if the investment was made in the USA or zero if the investment was made in Europe. HOLDING PERIOD is included to analyze the impact of the length of the investment as there are different assumptions on strategies associated with the duration of the investment and its success. The variable is scaled in years. To proxy the market conditions we use NO.OF IPO ISSUES, the number of worldwide initial public offerings per year and NO.OF M&A DEALS, the number of worldwide M&A transactions per year as well as BOOM, a dummy variable used as a proxy for the economic activity. Based on the U.S. index CFNAI and on the European index EuroCOIN, which measure GDP growth, BOOM equals to one if both indices are at least for four quarters above their long-term average and zero otherwise. HIGHTECH is a dummy variable that equals to one if the investment was made in the Healthcare & Other, Information Technology and Communications segment and equals to zero otherwise. This variable controls for the fact that IPOs in the high-technology segment are regarded as more common than in other segments.

The effects of the individual coefficients considering all outcomes are tested using the Likelihood-ratio test and Wald test. The appropriateness of the included right hand side variables in the model are determined by comparing the Akaike and the Bayesian information criteria. The overall fit of the model is determined by analyzing results of the Likelihood-ratio test, McFaddens's R^2 and adjusted R^2 . The log-likelihood function was estimated by Newton's method.

Furthermore, the independence from irrelevant alternatives (IIA) is tested. This property is an important and restrictive assumption of the multinomial logit model as pointed out by McFadden (1973): "Application of the model should be limited to situations where the alternatives can plausibly be assumed to be distinct and weighted independently in the eyes of each decision maker."⁹. Two tests are used to check this property, the Hausman-type test proposed by Hausman and McFadden

⁹ See Agresti (2002), page 299.

and an approximate likelihood ratio test proposed by McFadden, Tye and Train and later improved by Small and Hsiao. Results of both tests show that the IIA property is not violated.

OLS model

For analyzing the impact of the chosen exit vehicle on realized returns, an OLS model is used with IRR being the dependent variable. The IRR is a standard performance measure in the private equity industry. It presents the discount rate that equals the net present value of an investment's cash inflows with its cash outflows¹⁰.

Since we investigate the difference in positive performance among the outcome categories, we exclude write-offs from the analysis as they are always associated with an IRR of -100%. Thus, the data sample reduces to 567 observations. As a result, only IPOs and sales are analyzed as competing exit vehicles. They are included in the analysis via the dummy variable IPO that equals to one if the investment is exited via IPO and equals to zero if it is exited via sale.

To control for internal as well as external factors influencing the IRR, different variables are included. The ones that were already mentioned above (see also Table 1) are the HOLDING PERIOD, NO.OF IPO ISSUES, and NO.OF M&A DEALS. We incorporate additional variables that control for various industry segments¹¹ as well as INRATE, a variable that measures the risk free rate at the date the investment was made.

5.2 Results

Since the interpretation of estimates of nonlinear models is more complex than that of linear models, we use different approaches to describe the relationship between the relevant variables and each outcome as comprehensive as possible. The first approach is based on predicted probabilities that are estimated for each outcome category. Predicted probabilities allow us to understand the influence of each independent variable on the respective exit channel. But they are limited in the sense that they do not indicate the dynamics among the outcomes of the dependent variables. Therefore, we use an additional approach based on the odds ratios for interpretation. To obtain the odds ratios, the linear logit model has to be transformed by taking the exponential on both sides of the equation. The result is a multiplicative model, in which outcomes, the odds, are more intuitive measures than the logits. For more details, refer to the Technical Appendix in Annex 3.

¹⁰ The definition is obtained from the glossary of the NVCA Yearbook 2005.

¹¹ The following industry segments were incorporated in the model: Financial Business Services, Healthcare & Other, Information Technology, Communication, Materials, Services and Others. Consumer Discretionary as well as Industrial Production were excluded due to high collinearity.

Before investigating the individual influences of the variables, a first overview on the range of predicted probabilities for each of the three outcomes is given in Table 3.

	Mean	Std. Dev.	Minimum	Maximum	Range
IPO	0.1741	0.0939	0.0099	0.6660	0.6560
Sale	0.6786	0.1685	0.0892	0.9035	0.8143
Write-off	0.1473	0.1836	0.0000	0.8997	0.8996

Table 3: Predicted probabilities per exit vehicle

This table shows the summary statistics of the predicted probabilities obtained from the multinomial logit model. The statistics are presented for each of the dependent variable (IPO, sale and write-off) and display the mean, standard deviation, minimum and maximum value. The range is the difference between the maximum and minimum predicted probability.

The figures show that the range of the predicted probability for write-off is the widest, starting at a value close to zero and extending to 90%. This is followed by sale ranging from 9% to 81%. The range of IPO ranges from 1% to 66%. The distributions indicate that there are nonlinearities in the model that have to be taken into account as predicted probabilities occur below 20% and above 80%. Further conclusions can be drawn by looking at Table 4, which summarizes the effect of each variable on the predicted probabilities per exit channel.

AGE	Avg Chg	IPO	Write-off	Sale
Min->Max	0.124884	0.015037	0.172289	-0.187326
+1/2	0.002767	0.000829	0.003321	-0.004150
+sd/2	0.020092	0.005984	0.024154	-0.030138
USA=1	Avg Chg	IPO	Write-off	Sale
0->1	0.059087	-0.031849	0.088631	-0.056782
HOLDING PERIOD	Avg Chg	IPO	Write-off	Sale
Min->Max	0.355306	0.150777	-0.532958	0.382182
+1/2	0.029155	0.011495	-0.043732	0.032237
+sd/2	0.076336	0.029519	-0.114504	0.084985
NO.OF IPO ISSUES	Avg Chg	IPO	Write-off	Sale
Min->Max	0.099812	0.149719	-0.028428	-0.121291
+1/2	0.031464	0.047195	-0.008127	-0.039069
+sd/2	0.022076	0.033115	-0.005704	-0.027410
NO.OF M&A DEALS	Avg Chg	IPO	Write-off	Sale
Min->Max	0.216052	-0.324078	0.007447	0.316631
+1/2	0.006501	-0.009742	-0.000009	0.009751

-+sd/2	0.036194	-0.054255	-0.000036	0.054291
HIGHTECH=1	Avg Chg 	IPO	Write-off	Sale
0->1	0.079791	0.119687	-0.014944	-0.104743
BOOM=1	Avg Chg 	IPO	Write-off	Sale
0->1	0.109193	0.163789	-0.043189	-0.120600

Table 4: Effect of each variable on predicted probabilities

This table shows the statistics on predicted probabilities for a range of the independent variable, shown in the 1st row, holding all other variables constant at their mean. The changes are reported as the average changes above all exit channels in the second column and for each exit channel in the 3rd, 4th and 5th column. The first row under each variable presents the range of the predicted probability by changing the independent variable from its minimum to its maximum value. The following two rows show the change in the predicted probability as the independent variable increases by one unit from 1/2 unit below to 1/2 unit above the mean value and from 1/2 standard deviation below to 1/2 standard deviation above the mean value. Mean values are listed in the equation below the table. For dummy variables, the table shows only one row indicating the change in predicted probability as the variable changes from 0 to 1.

Mean values		HOLDING NO.OF IPO NO.OF M&A HIGHTEC					
	AGE	USA=1	PERIOD	ISSUES	DEALS	H=1	BOOM=1
x=	9.3913	0.19941	4.09033	3.13236	32.54230	0.18304	0.21429
sd(x)	7.2486						
=	3	0.39985	2.48017	0.70184	5.56541	0.38698	0.41063

Overall, the figures in Table 4 indicate that the range of probabilities for most variables is large enough to allow an examination on the impact of the variable on the respective probability of the exit channel. Exceptions are, for instance, the influences of the variable AGE on an exit via IPO. A change in AGE from the minimum to the maximum value changes the probability of an IPO only by 1%, making an interpretation hardly possible. In general, interpretations of changes in probabilities by varying one of the independent variables are based on the assumption that all other characteristics of the investment are set to their average values.

Hypothesis 1: Write-offs are more likely in shorter holding periods compared to IPOs and sales.

It was assumed that a write-off of an investment occurs near the beginning of the investment process. This suggests that underperforming investments are identified quickly and non-profitable investments are written off rather soon, instead of being held as living-dead investments.

As shown in Figure 5, as the holding period advances from 0 up to almost 16 years, the predicted probability of a write-off decreases whereas the probability for an exit via IPO or sale increases.

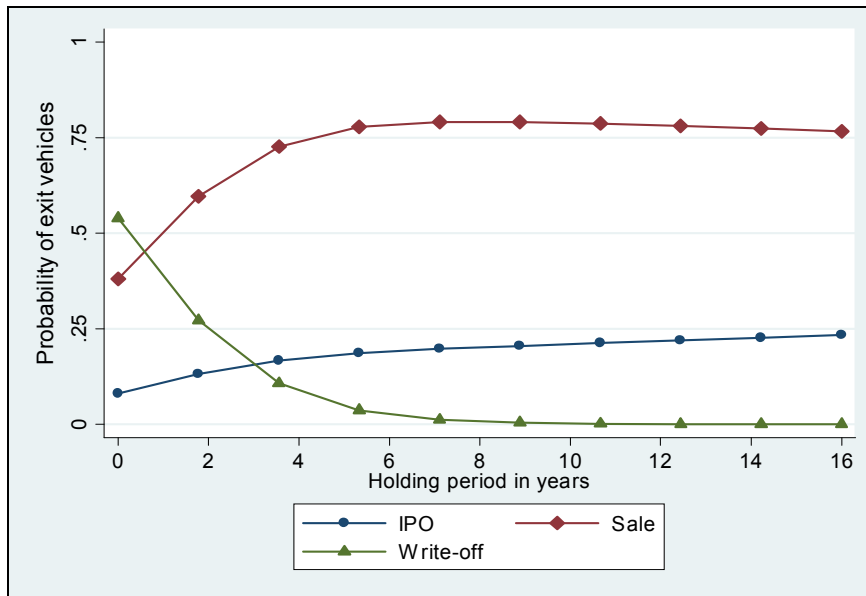


Figure 3: Change in predicted probabilities for varying holding periods.

Predicted probabilities are obtained from the multinomial logit model with the dependent variables IPO, sale and write-off. This graph shows the changes in probabilities as the holding period increases from its minimum to its maximum value, holding all other variables constant at their mean.

It can be seen that changes in predicted probabilities for the outcome write-off are greatest in the first years of the investment. The same result can be drawn for the category sale although there the probability rises. On the contrary, the probability of realizing an exit via IPO is quite stable over the duration of the investment. Table 4 presents the observations above numerically. Across the span of the holding period, the predicted probability of an investment being written off decreases by 53%. In contrast, the probability increases by 15% for exiting via IPO and 38% for sales). Furthermore, it can be seen from standard deviation changes that the holding period has a big influence on write-offs compared to other variables and outcomes. A standard deviation change in holding period centered around the mean will decrease the probability of a write-off by 11%. To further investigate the dynamics of exit channels among each other, we analyze the logit estimates obtained from the multinomial logit regression and presented in Table 5.

	Logit	Coefficient	z	Effect		Stand. Effect	
				exp(b)	%	exp(b)	%
AGE	I/S	0.0102	0.56	1.0103	1.03	1.0768	7.68
	W/I	0.0429	(1.89)*	1.0438	4.38	1.3645	36.45
	W/S	0.0531	(2.98)***	1.0545	5.45	1.4693	46.93
USA=1	I/S	-0.1149	-0.36	0.8915	-10.85	0.9551	-4.49
	W/I	1.1244	(2.81)***	3.0785	207.85	1.5677	56.77
	W/S	1.0096	(3.23)***	2.7444	174.44	1.4973	49.73
HOLDING PERIOD	I/S	0.0225	0.48	1.0228	2.28	1.0575	5.75
	W/I	-0.6843	(-7.40)***	0.5044	-49.56	0.1832	-81.68
	W/S	-0.6618	(-7.81)***	0.5159	-48.41	0.1937	-80.63
	NO.OF IPO ISSUES	I/S	0.3194	(2.07)**	1.3763	37.63	1.2513
	W/I	-0.3841	(-1.81)*	0.6811	-31.89	0.7637	-23.63
	W/S	-0.0647	-0.36	0.9374	-6.26	0.9556	-4.44
NO.OF M&A DEALS	I/S	-0.0682	(-3.28)***	0.9341	-6.59	0.6841	-31.59
	W/I	0.0551	(1.99)**	1.0567	5.67	1.3592	35.92
	W/S	-0.0131	-0.58	0.9870	-1.30	0.9299	-7.01
	HIGHTECH=1	I/S	0.7102	(2.71)***	2.0344	103.44	1.3163
W/I		-0.7952	(-2.12)**	0.4515	-54.85	0.7351	-26.49
W/S		-0.0850	-0.26	0.9185	-8.15	0.9676	-3.24
BOOM=1	I/S	0.9148	(3.71)***	2.4963	149.63	1.4559	45.59
	W/I	-1.5063	(-3.83)***	0.2217	-77.83	0.5387	-46.13
	W/S	-0.5915	(-1.67)*	0.5535	-44.65	0.7844	-21.56
No.of observations		=	672				
LR chi2(14)		=	186.63				
Pseudo R ²		=	0.1634				

Table 5: Logit Estimates on the determinants of the choice of exit channel

These results are obtained by using a multinomial logit model with the dependent variables IPO, sale and write-off. All independent variables included in the model are listed in the 1st column. The 2nd column shows the logits whereas the 3rd column includes the coefficients with signs indicating the direction of the effect. The significance levels for the p-value of the estimated coefficients are included in the 4th column and are denoted by *** for 1%, ** for 5%, and * for 10%. The effects and the standardized effects are presented in the last columns.

When the holding period increases by one year, the odds of realizing a write-off relative to an IPO reduces by 50%. The odds of realizing a write-off is reduced by 48%. Both results are significant at the 1% level.

As stated earlier, according to findings from Cumming and MacIntosh (2002), attention should also be paid to regional differences for the results above. First, it can be seen from Table 5 that the probability that an investment is written off instead of exited via IPO or sale increases if the investment was made in the U.S., indicating that write-offs are more common there. In the following table, we split the data sample into two parts separating the U.S. and European investments and perform the same MNL regression as for the whole sample. The results are shown in Table 6.

	EUROPE SUB-SAMPLE			U.S. SUB-SAMPLE		
	I/S	W/I	W/S	I/S	W/I	W/S
AGE	0.028 -1.18	0.037 -1.25	0.065 (2.62) ^{***}	-0.018 -0.58	0.05 -1.34	0.032 -1.23
HOLDING PERIOD	-0.008 -0.15	-0.714 (5.84) ^{***}	-0.722 (6.29) ^{***}	0.158 (-1.65) [*]	-0.74 (4.68) ^{***}	-0.582 (4.37) ^{***}
NO.OF IPO ISSUES	0.382 (2.22) ^{**}	-0.29 -1.1	0.092 -0.4	-0.14 -0.38	-0.123 -0.29	-0.263 -0.87
NO.OF M&A DEALS	-0.075 (3.21) ^{***}	0.065 (1.97) ^{**}	-0.01 -0.36	-0.024 -0.52	-0.015 -0.26	-0.039 -0.92
HIGHTECH=1	0.565 (-1.79) [*]	0.002 0	0.567 -1.45	1.223 (2.20) ^{**}	-2.579 (3.43) ^{***}	-1.356 (2.24) ^{**}
BOOM=1	0.856 (3.12) ^{***}	-1.268 (2.70) ^{***}	-0.412 -0.96	1.228 (2.02) ^{**}	-1.704 (2.10) ^{**}	-0.476 -0.71
CONSTANT	-0.649 -0.7	0.347 -0.27	-0.301 -0.28	-1.382 -0.83	4.546 (2.28) ^{**}	3.163 (2.12) ^{**}
	No.of observations = 538			No.of observations = 134		
	LR chi2(12) = 111.41			LR chi2(12) = 62.19		
	Pseudo R ² = 0.1319			Pseudo R ² = 0.2342		

Table 6: Logit Estimates for regionally sub-samples

The following results are obtained by using the multinomial logit model with the dependent variables, IPO (I), sale (S) and write-off (W). Independent variables are listed in the 1st column. The following

columns include the logits with the appropriate estimated coefficients. The t-statistic is included below the coefficients whereas significance levels for the p-value are denoted by *** for 1%, ** for 5%, and * for 10%.

There are no apparent differences between the regional sub-samples in the treatment of write-offs. Both sub-samples indicate that the probability of write-offs compared to other exit channels decreases with time. Furthermore, we also analyze a possible shift from non-performing investments toward the exit vehicle sale to examine the existence of the living-dead phenomenon found by Cumming and MacIntosh (2002) in the in the Canadian data sample. Therefore, we count the number of underperforming European and U.S. investments exited via sale with IRR less than -90%. The U.S. sub-sample includes only seven investments exited via sale with negative but greater than -90% IRR. Consequently, none of those investments are living-dead ventures. Forty-nine European investments with negative IRRs are exited via sale, only five of which have IRRs less than -90%. Thus, their proportion on European write-offs (covering 64 observations) is only around 8%, too small to support the living-dead phenomenon in the European data.

Overall, the results above provide strong support for Hypothesis 1. Given an average duration of four years, it can be stated that non-profitable investments are being written off soon as predicted probabilities decrease rapidly during the first years. Consequently, it seems that the more disciplined strategy is used rather than holding underperforming investments for too long. Thus, this supports the argument that signaling plays an important role for private equity investors in the U.S. as well as in Europe. Furthermore, Table 5 reveals that the probability of being written off increases compared to both other exit channels (IPO and sale) with the age and experience of the PE fund. This is consistent with Hypothesis 1 as it indicates that signaling is especially important for sophisticated PE managers.

Hypothesis 2: A favorable stock market environment increases the probability of an exit via IPO.

It was argued that buyouts, like most other asset classes, are driven by the market sentiment, especially with regard to IPO exits. To proxy the stock market environment, we use the number of worldwide IPOs. Figure 6 shows the probabilities for each exit channel as the number of worldwide IPOs increases.

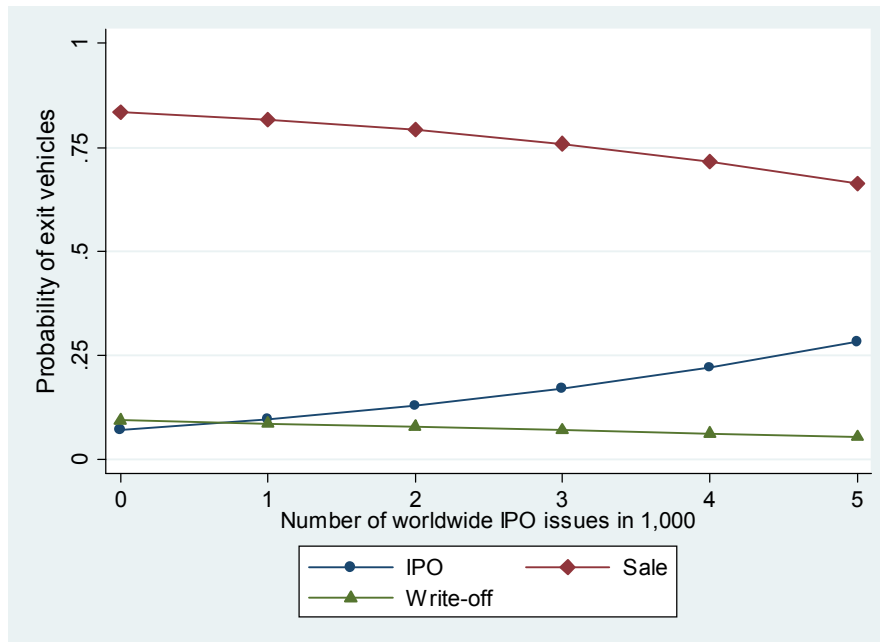


Figure 4: Effect of the IPO climate on predicted probabilities for each exit. Predicted probabilities are obtained from the multinomial logit model with the dependent variables IPO, sale and write-off. The following graphs show the changes in probabilities as the number of worldwide IPOs increase, holding all other variables constant at their mean.

The probability of an exit via IPO in the data sample increases steadily with the number of worldwide IPOs while that of an exit via sale decreases. The probability of being written off does not seem to be influenced very strongly by the stock market climate. Table 4 provides a more detailed view on the probability changes. It shows that the probability of a buyout-backed IPO increases by 5% with the number of worldwide IPO issues whereas the probability of a sale decreases by 4%.

In Table 5, it can be seen that the IPO climate also influences the odds IPO sale in the buyout segment. An increase of IPO issues by 1,000 per annum is expected to increase the chance of realizing an IPO by 38%. The result is significant at the 1% level. Furthermore, we also investigate the effect of other macroeconomic variables on the odds IPO versus sale. To compare the effects of variables that are scaled differently, we use standardized estimates that are shown in the right column in Table 5. In the percent column of the standardized effect, a period with high economic growth (measured through the variable BOOM) has the largest effect on the odds of realizing an IPO relative to a sale with an increase of 46%, followed by the number of IPO issues with an increase of 25%. On the other side, an increase in the worldwide M&A activity reduces the chance of realizing an IPO relative to a sale by 32%. This is in line with general arguments claiming that private and public markets are at least partly substitutes. It can be further stated that the number of write-offs decreases during times with strong economic growth, which is intuitive.

Additionally, in Table 7, we split the data sample according to investments that were exited before the 2000 New Economy Boom and those afterwards (since 2001) to analyze the differences that may have arisen through the stock market crash.

	YEAR OF EXIT < 2001			YEAR OF EXIT >= 2001		
	I/S	W/I	W/S	I/S	W/I	W/S
AGE	0.0060 0.23	-0.0148 -0.41	-0.0088 -0.29	0.0231 0.74	0.0392 1.10	0.0623 (2.41)**
USA=1	-0.3360 -0.77	1.6886 (2.83)***	1.3526 (2.81)***	0.3207 0.59	0.9764 1.51	1.2971 (2.75)***
HOLDING PERIOD	0.0915 1.13	-1.1940 (-6.69)***	-1.1025 (-6.597)***	0.0706 0.93	-0.7003 (-5.21)***	-0.6297 (-5.31)***
NO.OF IPO ISSUES	0.5918 (3.067)***	-0.4036 -1.45	0.1882 0.80	-0.4446 -0.98	0.4572 0.78	0.0127 0.03
NO.OF M&A DEALS	-0.0604 (-2.75)***	0.0767 (2.38)**	0.0163 0.60	-0.0350 -0.28	-0.1378 -0.82	-0.1728 -1.28
HIGHTECH=1	0.4585 1.36	-1.0251 (-1.86)*	-0.5666 -1.16	1.2722 (2.84)***	-0.4570 -0.79	0.8151 (1.68)*
BOOM=1	0.7443 (2.72)***	-0.7874 (-1.75)*	-0.0431 -0.11	-	-	-
	No.of observations = 402			No.of observations = 270		
	LR chi2(12)= 129.62			LR chi2(12)= 93.86		
	Pseudo R ² = 0.1855			Pseudo R ² = 0.2164		

Table 7: Logit estimates before and after the New Economy Boom

These results are obtained by using the multinomial logit model with the dependent variables IPO (I), sale (S) and write-off (W). Independent variables are listed in the first column. The following columns include the logits with the appropriate estimated coefficients. The t-statistic is included below the coefficients whereby significance levels for the p-value are denoted by *** for 1%, ** for 5%, and * for 10%.

The results show that for buyout investments that went public before the end of 2000, the IPO climate had a significant positive effect whereas for investments that went public since the beginning of 2001,

the IPO climate does not provide statistically significant estimates. With regard to the M&A activity, we found results before the crash being similar to those for the whole sample. After the crash, the figures show insignificant results.

Generally, it can be confirmed that even for the buyout segment, the decision to go public is driven by the market sentiment and Hypothesis 2 is thus supported. During a dramatic market crash like the fall of the New Economy Boom, these findings do not hold any longer. A possible explanation could be found in behavioral finance, a phenomenon called herding. It states that market participants are influenced in their decisions by observations they made in the past. Well-performing IPOs have a positive effect on the occurrence of herding whereas in a market collapse, herding disappears.

Hypothesis 3: *In the U.S. market the probability of a buyout-backed IPO is higher than in European stock markets.*

Due to market characteristics, especially the more developed stock markets in the U.S., we argued that buyout-backed IPOs are more common there than in European countries. As shown in Table 4, the probability of realizing an IPO is 3% smaller for U.S. than for European investments. This is also the case for an exit via sale, where the probability reduces by 5% if an investment is made in the U.S.. Instead the predicted probability for realizing a write-off increases by 8% for U.S. investments. From Table 5, it can be seen that a write-off compared to an IPO or sale is more likely in the U.S..

However, it has to be considered that the proportion of U.S. investments is quite small including only 134 observations, making up only 20% of the whole data sample. This share does not represent the real world proportion of the PE market as European investments are overrepresented with 80%. We then reduce the European data sample to 134 observations equal to the number of U.S. observations. Although it still does not represent the real world proportion it approaches it and meets the requirement of the data sample size needed to perform approximations. To avoid arbitrary selection, the collection of the reduced European sub-sample was made randomly. The proportion of each industry segment stays the same in the reduced sample. Results of analysis on the reduced sample are provided in Table 8.

	I/S	W/I	W/S
AGE	-0.03 -1.14	0.08 (2.52)**	0.05 (2.17)**
USA=1	0.624 -1.49	0.435 -0.8	1.059 (2.51)**

HOLDING PERIOD	0.008 -0.11	-0.641 (4.94)***	-0.632 (5.53)***
NO.OF IPO ISSUES	0.24 -0.89	-0.516 -1.58	-0.276 -1.11
NO.OF M&A DEALS	-0.012 -0.35	-0.015 -0.36	-0.027 -0.81
HIGHTECH=1	0.594 -1.46	-1.274 (2.32)**	-0.68 -1.5
BOOM=1	0.853 (2.08)**	-1.304 (2.29)**	-0.45 -0.93
CONSTANT	-2.297 (-1.71)*	3.795 (2.30)**	1.498 -1.21
No.of observations =	286	268	286
LR chi2 (14) =	95.55	95.55	95.55
Pseudo R ² =	0.199	0.199	0.199

Table 8: Multinomial logit estimates of the reduced data sample

The following results are obtained by using the multinomial logit model with the dependent variables IPO (I), sale (S) and write-off (W). Independent variables are listed in the first column. The following columns include the logits with the appropriate estimated coefficients. The t-statistic is included below the coefficients whereby significance levels for the p-value are denoted by *** for 1%, ** for 5%, and * for 10%.

Compared to the results obtained by using the whole data sample of 672 observations, the analysis on the reduced number of observations with equal proportion of U.S. and European investments shows few differences. Although the coefficient for the odds IPO versus sale has the expected sign indicating that the chance of realizing an IPO over sale is higher for U.S. investments, the result is statistically insignificant. Since stock markets in the U.S. and UK are often regarded as quite similar, we also analyze the effects when the sample is split into UK & U.S. investments (425 observations) and other European investments (247 observations). The results show neither the expected positive sign nor statistical significance.

Therefore, Hypothesis 3 is not supported by the reduced data sample or merged data from the U.S. and UK investments. Thus, market characteristics defined through the higher degree of development and experience do not have an influence on the likelihood of IPOs compared to sales.

Hypothesis 4: *An exit via IPO has a positive effect on realized returns.*

We argued that IPOs are a more successful exit channel than sales. To test the hypothesis, we use an OLS regression with results presented in Table 9.

	IRR	BOOM=1 IRR	BOOM=0 IRR
IPO=1	0.614 (5.74)***	1.102 (3.55)***	0.352 (3.49)***
HOLDING PERIOD	-0.123 (6.71)***	-0.26 (3.48)***	-0.097 (6.21)***
USA=1	0.278 (2.33)**	-0.258 -0.63	0.342 (3.26)***
FINANCIAL & BUSINESS SERVICES	-0.146 -0.64	0.013 -0.02	-0.162 -0.78
HEALTHCARE & OTHER	-0.224 -1.12	-0.53 -0.74	-0.128 -0.73
INFORMATION TECHNOLOGY	0.363 (2.18)**	0.757 -1.15	0.386 (2.70)***
COMMUNICATION	0.244 -1.26	1.221 (2.07)**	0.067 -0.38
MATERIALS	0.245 -1.03	0.367 -0.47	0.066 -0.31
SERVICES	0.269 (2.03)**	-0.396 -0.8	0.335 (2.91)***
OTHERS	0.077 -0.48	-0.209 -0.43	0.117 -0.79
NO.OF IPO ISSUES	-0.164 (2.65)***		
NO.OF M&A DEALS	0.005 -0.65		
RISK FREE RATE	0.029 -0.87		
CONSTANT	1.126 (3.04)***	1.538 (4.06)***	0.792 (8.24)***
No.of observations =	567	127	440
R ² =	0.17	0.24	0.17
adj. R ² =	0.15	0.18	0.15

Table 9: Determinants of the Internal Rate of Return (IRR)

Estimates are based on an OLS regression with IRR as the dependent variable. IPO is a dummy variable equal to 1 if the portfolio company is exited via IPO and 0 if via sale. HOLDING PERIOD measures the investment duration in years. Further variables describe industry segments¹² and market environment. The two right columns split the data sample into phases with different economic

¹²The 27 industry classifications provided by CEPRES were aggregated to the following industry segments: **Financial Business Services**: Financial Services, Business Services, Fund of Fund Investments; **Consumer Discretionary**: Consumer Industry/Food, Hotel, Leisure, Retail, Textiles; **Healthcare & Other**: Healthcare/Life Sciences; **Industrial Production**: Construction, Industrial/ Manufacturing, Traditional Products, **Information Technology**: High Tech, IT, Semiconductor, Software; **Communication**: Internet, Media, Telecom; **Materials**: Materials, Natural Resources/ Energy; **Services**: Environment, Logistics, Transportation, Waste/ Recycling, Other Services; **Others**.

activity. BOOM=1 indicates that GDP growth was above its long-term average for at least four quarters; otherwise, BOOM equals to 0. Significance levels for the p-value of the estimated coefficients are denoted by *** for 1%, ** for 5%, and * for 10%.

This table includes regression results for the full sample as well as for two sub-samples. The sub-samples are divided according to periods that are defined as boom phases. We define a period being a boom phase when both indices (for Europe the EuroCOIN index and for the U.S. the CFNAI) are above their long-term average for at least four consecutive quarters. IPO presents a dummy variable that equals to one if the investment was exited via an IPO and equals to zero if it was sold. The results of the whole data sample shows a difference of 0.65 for the dummy variable IPO, meaning that through an exit via IPO, the IRR that can be achieved is on average 0.61 times higher than for sales. From the sub-sample results, it is shown that the magnitude of the effect is stronger in boom times yielding 1.1 times greater returns than in times with economic low activity, where returns of IPOs are only 0.35 times larger than those for sales. The results are significant at the 1% level.

It can be concluded that exiting a portfolio company via IPO yields higher returns for the asset class of buyouts than exiting via sale. Even if the magnitude at a first glance is not what we expect for high-flyers, differences arise in phases with extraordinary high economic growth. The IRR of buyouts is clearly driven by the market sentiment; thus the valuation of buyouts seems to be cyclical too. This result is in line with Hypothesis 2 that the market climate has a strong influence on the decision to take buyout companies public.

The OLS regression further reveals statistically significant result for the investment duration. With an increase of the holding period by one year, the IRR reduces on average by 12%. The decrease is observable in both sub-samples. An increase of one year leads to an average reduction of the IRR of 26% during boom periods and 10% in other times. Timing also plays a central role and fast exits during boom periods are an important factor. The negative sign raises questions as it does not seem to support the value-adding thesis introduced above. Since theories about value creation in buyouts differ with regard to the holding period, we cluster the duration of the investments to analyze possible differences. Based on the clustering performed by Cao and Lerner (2006), we differentiate between investments that are exited within one year (also referred to as quick flips), investments that have an average holding period and those with a holding period above average. The latter considers the quality signal by investments exceeding a certain holding period. As pointed out by Cumming and MacIntosh (2002), those investments signal the inability to exit due to their low. In all sub-samples, we found average IRRs to decline with an increase in investment duration. Thus, the value adding thesis does not seem to be supported. A possible explanation could be the reinvestment problem presented by Manigart et al. (2002). This states that PE managers face difficulties in finding new investments

when a portfolio company is liquidated too fast. Thus, PE managers require a higher return for an investment with a short holding period. Additionally, recent studies showed that there are various factors influencing the performance and holding period as pointed out by Ljungqvist and Richardson (2003). In detail, they reviewed different studies and stated that exits are based on individual strategies of PE fund managers. Those can be based, for instance, on current market conditions or considerations affecting their reputation. Also, Wright et al. (1994) who analyzed the longevity of buyouts pointed out that there are numerous influences on the investment's duration. Overall, this makes the isolated analysis of the relationship between the duration of the investment and the process of value adding difficult and comprehensive, although it opens opportunities for further research.

Additionally, the analysis reveals that companies in the Information Technology and Services segment achieve high returns. However, results for the sub-samples are ambiguous and statistically significant only for periods outside boom phases. Thus, it can be stated that special industry segments are able to achieve higher returns, although booming periods with probably high valuation levels seem to blur this effect.

Results of the OLS regression also show negative impact of the number of worldwide IPOs on the IRR. According to Fenn, Liang and Prowse (1997) lower returns during periods with greater capital availability could be due to the fact that within those times, there are more unsophisticated private equity investors operating in the market. During booming periods, deals close more quickly leaving less time for thorough due diligence, deal structuring and pricing, resulting in lower returns.

6. Robustness checks

To control the reliability of the estimates, we perform different robustness checks. Results are presented below. We use alternative measures for the funds experience as well as macroeconomic factors. The variable, EXPERIENCE, is a dummy variable that equals to one if at the date the investment was made, the PE investor had already raised a fund previously. It equals to zero if it was a first time fund. VCBOOM is a dummy variable that proxies for IPO activity in the private equity market. It equals to one if private equity backed-IPOs exceed their long-term average (1990-2004); otherwise, it equals to zero. HOTIPO is also a dummy variable that accounts for the New Economy Boom and equals to one if the investment was exited in the year 1999 or 2000 and 0 otherwise. Lastly, we include the volume of worldwide M&A deals through the variable, VOL.OF M&A DEALS.

Results for the multinomial logit model are shown in Table 10.

	Model (1)		Model (2)		Model (3)		Model (4)		Model (5)	
	I/S	W/S	I/S	W/S	I/S	W/S	I/S	W/S	I/S	W/S
EXPERIENCE=1	0.05	0.99	0.208	0.909	0.185	0.922	0.126	0.899	0.063	0.958
	-0.23	(3.33)***	-0.93	(3.04)***	-0.83	(3.10)***	-0.57	(3.06)***	-0.29	(3.27)***
USA=1	-0.055	1.243	-0.131	1.252	-0.113	1.24	-0.062	1.261	-0.011	1.235
	-0.18	(4.33)***	-0.44	(4.33)***	-0.38	(4.30)***	-0.21	(4.40)***	-0.04	(4.33)***
HOLDING PERIOD	0.019	-0.705	0.073	-0.741	0.067	-0.74	0.025	-0.711	0.005	-0.69
	-0.42	(8.17)***	-1.45	(8.41)***	-1.34	(8.42)***	-0.52	(8.16)***	-0.1	(8.08)***
NO.OF IPO ISSUES	0.321	-0.088								
	(2.09)**	-0.48								
VCBOOM=1			0.885	-0.697	0.998	-0.657				
			(3.60)***	(2.57)**	(3.97)***	(2.41)**				
HOTIPO=1							0.79	-0.456	1.247	0.22
							(2.01)**	-0.98	(2.56)**	-0.4
NO.OF M&A DEALS	-0.066	-0.006	-0.063	-0.014			-0.102	0.012		
	(3.26)***	-0.26	(3.36)***	-0.6			(3.48)***	-0.36		
VOL.OF M&A DEALS					-0.004	-0.002			-0.007	-0.002
					(3.68)***	-1.44			(3.68)***	-1.23
HIGHTECH=1	0.722	-0.027	0.686	0.02	0.677	0.022	0.64	-0.007	0.617	-0.008
	(2.76)***	-0.08	(2.64)***	-0.06	(2.60)***	-0.07	(2.50)**	-0.02	(2.41)**	-0.02
BOOM=1	0.906	-0.646								
	(3.70)***	(1.84)*								
No.of observ.=		672		672		672		672		672
Pseudo R ² =		0.1662		0.1670		0.1696		0.1507		0.1517

Absolute value of z statistics in parentheses

* significant at 5%; ** significant at 1%

Table 10: Robustness checks for the multinomial logit model

The following coefficients are estimated by using a multinomial logit model with the dependent variables IPO (I), sale (S) and write-off (W). Independent variables are listed in the first column. The

following columns include the logits for each model with the outcome sale as base category. The t-statistic is included below the estimated coefficients, where significance levels for the p-value are denoted by *** for 1%, ** for 5% and * for 10%.

Overall, the figures support Hypotheses 1 through 3 presented here. They also support the results found in line with the signaling effect, showing that signaling plays an important role, especially for sophisticated investors.

Results of the robustness checks for the OLS model are presented in Table 11.

	Model (1)	Model (2)	Model (3)	Model (4)
	IRR	IRR	IRR	IRR
IPO=1	0.58 (5.42)***	0.60 (5.48)***	0.60 (5.64)***	0.58 (5.33)***
HOLDING PERIOD	-0.12 (6.27)***	-0.13 (6.45)***	-0.12 (6.18)***	-0.13 (6.85)***
USA=1	0.25 (2.06)**	0.25 (2.09)**	0.26 (2.15)**	0.25 (2.05)**
FINANCIAL & BUSINESS SERVICES	-0.13 -0.57	-0.15 -0.67	-0.14 -0.60	-0.15 -0.64
HEALTHCARE & OTHER	-0.23 -1.15	-0.22 -1.11	-0.21 -1.03	-0.24 -1.22
INFORMATION TECHNOLOGY	0.39 (2.31)**	0.37 (2.20)**	0.37 (2.20)**	0.39 (2.34)**
COMMUNICATION	0.25 -1.30	0.25 -1.30	0.25 -1.27	0.25 -1.29
MATERIALS	0.23 -0.94	0.23 -0.95	0.24 -0.99	0.22 -0.94
SERVICES	0.23 (-1.75)*	0.23 (-1.71)*	0.24 (-1.78)*	0.23 (-1.76)*
OTHERS	0.06 -0.34	0.05 -0.29	0.05 -0.32	0.05 -0.33
HOTIPO=1	0.11 -0.67			
NO.OF M&A DEALS	0.00 -0.25	0.00 -0.48		
RISK FREE RATE	0.04 -1.26	0.05 -1.38	0.04 -1.32	0.05 -1.45
VCBOOM=1		-0.03 -0.26		
VOL.OF IPO ISSUES			-0.01	

			-0.78	
COMCAP				0.00 -0.46
VOL.OF M&A DEALS			0.00 (-1.90)*	
CONSTANT	0.81 (-1.88)*	0.62 (-1.95)*	0.66 (2.72)***	0.75 (3.90)***
No. of observations =	567	567	567	567
R ² =	0.16	0.16	0.17	0.16

Table 11: Robustness checks for the OLS model

Estimates are based on an OLS regression with IRR as the dependent variable. IPO is a dummy variable equal to 1 if the portfolio company is exited via IPO and 0 if via sale. Significance levels for the p-value of the estimated coefficients are denoted by *** for 1%, ** for 5%, and * for 10%.

Overall, it can be seen that Hypothesis 4 is also supported by including alternative variables. To analyze the 'money chasing deal' argument emerged in line with the OLS regression, we incorporate the variable, COMMITTED CAPITAL, as the committed capital to the private equity market at the exit date of the investment. However, we could not find additional statistical support for the negative impact on liquidity or competing fund inflows on returns within the present data.

7. Conclusion

This study focuses on buyout exit strategies in Europe and the United States. We analyzed the three main exit routes IPO, sale and write-off using a unique data set derived from CEPRES' Private Equity Analyzer. This database contains anonymous cash flow information on the individual investment level. We analyze the motivations behind and determinants influencing the choice of an exit vehicle using a multinomial logit model. We find strong support for the signaling effect, implying that PE investors tend to write-off investments that turn out to be non-performing soon, instead of holding them in their portfolios as living-dead investments. Through this strategy, PE investors show their ability to differentiate between investments that are worth further support and those that are not. Additionally, we find evidence that exit decisions for buyouts are also driven by the market sentiment and thus seem to be cyclical as other investments types. On the contrary, we do not find support for the influence of market characteristics on the choice of exit vehicles. Despite this, we evaluate the influence of a chosen exit vehicle on the IRR of the investment using a multivariate regression model. We find support for the common argument that only exceptional firms are taken public as they achieve higher returns. We find returns being superior for IPOs compared to sales in periods with high

GDP growth. In future research, it would be insightful to analyze the category of sales in more detail as this general exit vehicle comprises several sub-types that could not be recognized herein. It would also be interesting to analyze the influence of the holding period on buyout returns as this relationship is still puzzling.

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