



The Specialization Effect in Private Equity:

A Study of Value Creation in Buyouts

Master Thesis, MSc Financial Economics

Student: Alexander Leutscher

alexleutscher@student.eur.nl

December, 2016

Supervisor: Hans Haanappel

Erasmus School of Economics

Erasmus University Rotterdam

ABSTRACT

Using a dataset comprising 101 Private Equity (PE) backed Leveraged Buyouts (LBOs) completed and exited in the Benelux during the period 2003–2011 and a matched sample of non-PE-backed companies, this study sheds new light on the impact of PE involvement and relative investment specialization by PE firms on post-buyout performance of acquired companies during the first 3 years after the transaction. There are three main findings. First, I find that over the first three post-buyout years PE-backed companies grow faster and show higher levels of operating profits compared to non-buyout companies. In addition, multivariate analyzes suggest that these changes in performance are at least partly due to the governance of PE firms. Second, bivariate analyzes show that buyouts backed by industry specialized PE firms experience lower levels of turnover growth and profitability compared to buyouts backed by not so-specialized PE firms. This is supported by multivariate analyzes, suggesting that there exists no significant effect of PE industry specialization on post-buyout performance. Finally, similar results are observed for PE buyout specialization, suggesting that buyout specialization has no systematic effect on either post-buyout profitability or growth.

Keywords: buyouts, private equity, value creation, performance, specialization

JEL classification: G24, G34

TABLE OF CONTENTS

ABSTRACT	2
TABLE OF CONTENTS	3
1. INTRODUCTION.....	4
2. LITERATURE REVIEW.....	7
2.1 Introduction to LBO	7
2.1.1 LBO basics.....	7
2.1.2 Critical factors to successful LBOs.....	8
2.2 How do LBOs create value?.....	12
2.2.1 Financial engineering.....	12
2.2.2 Governance engineering	13
2.2.3 Operational engineering.....	14
2.2.3 Empirical findings on post-buyout performance	15
2.3 The specialization effect in PE	16
2.3.1 Specialists vs. generalists.....	17
2.3.2 Empirical findings on the specialization effect in PE.....	19
2.4 Conclusion	21
3. EMPIRICAL RESEARCH	24
3.1 Methodology and data	24
3.1.1 Research design	24
3.1.2 Hypotheses	26
3.1.3 Sample and data sources	28
3.1.4 Variables	31
3.2 Analyses and results	35
3.2.1 Descriptive statistics	35
3.2.2 Testing for normality	38
3.2.3 Bivariate comparisons.....	40
3.2.4 Sample correlation matrix.....	43
3.2.5 Regressions	45
3.3 Conclusion.....	54
4. CONCLUSION & DIRECTIONS FOR FUTURE RESEARCH.....	56
5. BIBLIOGRAPHY	59

1. INTRODUCTION

Over the last decades the PE industry is developed into an important component of corporate finance¹. In an LBO, a PE firm acquires majority control of a mature company, or a division of a company, using a relatively small portion of equity and relatively large portion of outside debt financing. When examining the development of the private equity industry, one can say that buyouts have had a notorious history. LBOs first showed increased popularity in the mid-1980s. Because of the development of the market for high-risk bonds, the so-called junk bond market, investment firms could finance large acquisitions with only limited amounts of equity (Kaplan and Strömberg, 2009). However, a few years later the junk bond market crashed following the demise of the investment bank, Drexel Brunham Lambert, and a large number of high-profile leveraged buyouts resulted in default and bankruptcy. A second wave of buyout transactions started in the late 90s, with 2006 and 2007 showing record-breaking amounts of capital committed to PE (Hoskisson, Shi, Yi & Jin, 2013) . The extent of buyout transactions equaled, if not overtook the extent of buyout transactions of the first wave in the mid-1980s. But when exploring the economic revolution of buyouts, it seems to be that to every wave comes an end. This time the turmoil in the debt markets in 2008 resulted in a decreasing amount of private equity investments (Kaplan & Strömberg, 2009). The development of theory on private equity tells us that changing market circumstances and economic turbulence will always have a great influence on the extend of private equity commitments and activity.

Despite the recent worldwide credit crunch, the acquisition climate is on the rise again. However, the debate exists whether PE firms enhance post-buyout performance of acquired companies relative to their non-PE backed peers. Proponents and critics of PE have different views concerning this subject. Critics of highly leveraged deals often argue that it could lead to short-term performance focus. Kaplan and Strömberg (2009) argue that PE firms could force their portfolio companies (PC) to increase short-term cash flows in order to service the buyout debt at the expense of long-term performance. In addition, some critics assume that PE firms are a kind of corporate raiders who are plundering target companies at the expense of employees who suffer job and wage cuts. The financial spokesman for the PVDA, Henk Nijboer, mentioned in the Financial Daily that buyout firms are charging acquired companies with a huge amount of debt and draining their financial resources via high dividends according

¹ By private equity, I mean the portion of the industry that engage in leveraged buyouts. PE firms that are specialized in venture capital (VC) invest in young or emerging companies and typically do not obtain majority control (Kaplan and Strömberg, 2008). In this paper the performance of other sectors of this industry, such as venture capital, will not be analyzed.

to the Anglo-Saxon shareholder model. He gave the failures of “van Gansewinkel, Atteró, V&D and Estro” as examples and continued that these firms collapsed due to investors who can solely think of making money.

By contrast, proponents of PE argue that PE is an efficient form of organization that generates economic efficiencies by applying financial, governance, and operational engineering to their PCs, and in so doing, improving firm performance (Kaplan & Strömberg, 2009). This is in line with existing empirical literature on the economic effects of buyouts. PE firms add value to their PCs by committing long-term investment capital, better corporate governance and quality advice, thereby creating economic value (Jensen, 1986; Lichtenberg and Siegel, 1990; Berg & Gottschalg, 2005; Nikoslainen & Wright, 2007; Renneboog, Simons & Wright, 2007; Acharya, Hahn & Kehoe; 2013). In today’s buyouts, however, research shows that in particular operational engineering plays an important role in the value creation of LBOs. While financial and governance engineering continues to be important, PE firms attempt to distinguish themselves from their competitors by specializing in certain industries or financial stages. By doing so, PE firms seek to develop operating capabilities they could use to add additional value to their investees.

In spite of the fact that the post-buyout performance of PE-backed companies relative to their non-PE-backed competitors is extensively analyzed in former studies, little attempt has been made to analyze empirically the effects of specialization differences amongst PE firms and their possible impact on the performance of acquired companies. Earlier empirical research identified two strategic dimensions of PE firms in which they tend to circumscribe their activities, which are firm investment focus by industry and by stage (Norton and Tenenbaum, 1993; Gompers, Kovner, Lerner, & Scharfstein, 2008; Lossen, 2007; Aigner, Beyschlag, Friederich, Kalepky & Zagst, 2008; Meuleman, Wright, Manigart & Lockett, 2009). In a related paper, Cressy, Munari and Malipiero (2007) analyze whether specialization by PE firms in certain industries or financing stages relative to their competitors provides them with an potential competitive advantage over its peers. In their research, Cressy et al. (2007) show that greater industry specialization of PE firms is associated with improvements in post-buyout operating performance of their PCs. However, the authors do not find evidence to support the expectation of PE stage specialization to be beneficial for post-buyout performance of acquired companies. As regards to Cressy et al.’s (2007) research, the findings relied on data from the United Kingdom where the private equity industry is considered to be highly developed and PE firms already have had the opportunity to build relevant experience. The authors suggest further research because other European countries might show different results

as the supply and demand side of the PE industry, as well as the institutional and financial environments might be dissimilar.

These findings and suggestions inspired me to do further research on this topic, which is in this case the specialization effect in PE on post-buyout performance in the Belgium, Netherlands and Luxembourg (Benelux). Therefore, this research will deal with the following research question:

“Do buyout firms backed by industry or stage specialized private equity firms experience higher post-buyout operating performance compared to buyout firms backed by non-specialized private equity firms in the Benelux?”

The formulated hypotheses in this study are tested on a dataset of 101 buyouts occurred in the Benelux over the period 2003-2011. The outcomes of the thesis provide useful insight in the development of specialized PE firms and their influence on post-buyout performance. Furthermore, this research contributes in further understanding what the implications of specialization by PE firms in the Benelux for acquired companies and the market as a whole are and will be in the future.

This thesis provides both a qualitative and quantitative study that together attempt to answer the research question. First, the literature review forms the qualitative part of the thesis. In this part, I briefly summarize a complete theoretical picture of buyouts, based mainly on available literature on the subject. This chapter follows a step-by-step approach, starting with a basic explanation of LBOs, critical factors for their success and their performance. This is followed by the motivations of PE firms to specialize in certain industries or stages of investment and how investment strategy differences amongst PE firms can be associated with superior post-buyout performance of acquired companies. Chapter three contains an empirical study to test the effect of PE specialization on the performance of buyouts in the Benelux. This includes a description of the methodology and data, an analysis of the empirics and a discussion of the results. This chapter is closed with a conclusion of the results. Finally, the last chapter outlines the main conclusions to be drawn from this thesis and provides suggestions for future research.

2. LITERATURE REVIEW

This chapter provides a qualitative research on several aspects of the LBO. The first section explains the basics of the LBO and some critical factors that are considered to be of great importance for their success. The section that follows describes a three-dimensional conceptual framework that captures the full complexity of value generation in buyouts. The framework explains three ways in which PE investors add value to their investees (as proposed in the academic literature) and are today widely accepted as crucial ingredients of successful buyouts. In addition, this section summarizes the findings in academic literature on the impact of PE on post-buyout operating performance of acquired companies. The last part of this chapter focusses on the motivations of PE firms to specialize in certain industries or financial stages and analyzes whether specialization provides the PE firm with a competitive advantage over its peers. Finally, this chapter is closed by Table 1 which presents a summary of the most important theories in this chapter.

2.1 Introduction to LBO

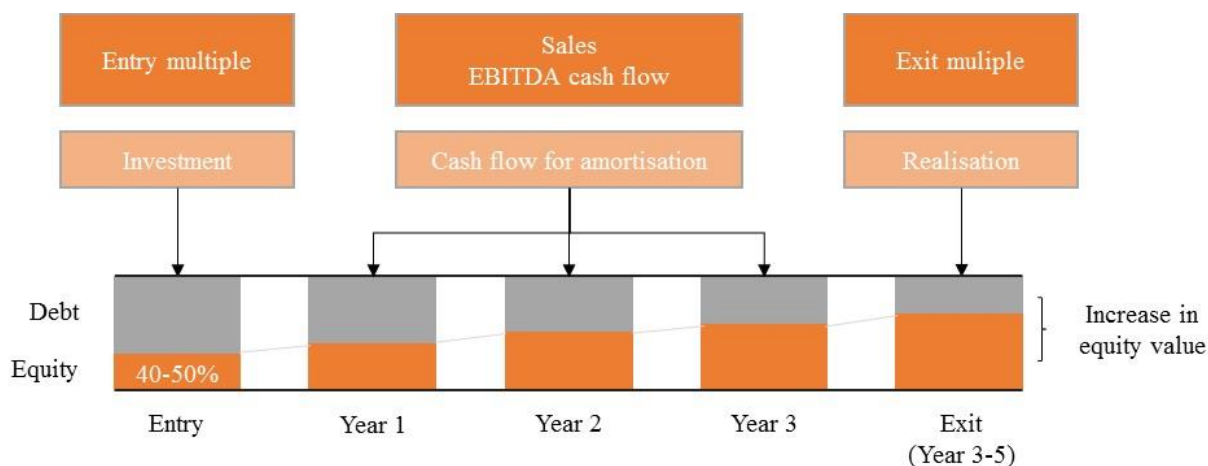
2.1.1 LBO basics

As mentioned before, buyout transactions are typically highly leveraged (hence the term leveraged buyout). LBOs are a tool for companies to make large acquisitions without having to commit a lot of capital. The ultimate purpose of LBOs is to finance the deal with a minimum amount of equity and a maximum amount of outside debt, which is typically provided by large financial institutions (e.g. investment banks and institutional investors). The benefit of using debt as a financing vehicle for acquisitions is that return on debt is fixed. By increasing the amount of debt, the risk profile of equity holders increases, which allows companies to make large returns without having to commit a lot of capital. The equity capital is typically raised through a PE fund, which can be seen as vehicles in which investors commit to provide a certain amount of money to pay for investments in companies as well as management fees to the PE firm (Kaplan & Strömberg, 2009). The PE funds usually are limited partnerships, in which the general partner (the PE firm) has made a substantial personal investment, allowing the general partner to manage the fund while the limited partners provide most of the capital. Institutional investors, such as corporate and public pension funds, endowments, insurance companies, as well as wealthy individuals, typically invest in these funds as limited partners. PE funds invest

for the long-term and often take an active role in managing the firms they acquire (DePamphilis, 2014).

Figure 1:

The basic principle of a LBO (source: Credit Suisse, 2015)



The basic principle of an LBO is shown in figure 1. The point of entry can be thought as the start of the LBO where a company is being acquired by a PE firm with 40-50% of equity and the rest borrowed from financial institutions. Over time, one can see that the amount of debt decreases and the amount of equity increases. As the operations of the acquired company are being improved over time due to strong governance and operating engineering, cash flows increase and will primarily be used to service and pay down its debt. One can assume that at point of entry the total value of a company is equal to the total value at point of exit, but the EBITDA (/cashflows) will increase over time which implies that the business will be probably worth more at exit.

2.1.2 Critical factors to successful LBOs

There are many factors that contribute to the success of LBOs. However, former empirical studies show that target selection, not overpaying, a good exit strategy and improving the PCs performance are of greatest importance. In this section, these factors will be reviewed in more detail.

(i) Target selection

For the LBO to become a success, the target must be a suitable LBO candidate. Therefore, the next logical question is what type of businesses define strong LBO candidates. Earlier research

shows that PE firms select their PCs based on specific firm characteristics. First, PE investors look for targets that have substantial unused borrowing capacity and undervalued assets. Aslan & Kumar (2007) compare 157 PE deals with private and public companies in the UK and Ireland, which undertook between 1996-2006. Their research shows that PE firms select targets that have growing assets, higher return on assets, higher liquidity, but lower market-to-book and leverage ratios. When a target firm has undervalued assets, these assets can be used as collateral for debt from assets-based lenders. Undervalued assets may also provide significant tax benefits because they may be revalued following the closure of the deal to their fair market value and depreciated or amortized over their allowable tax lives (DePamphilis, 2014). Nevertheless, these factors enhance the borrowing capacity of the target and thus represent an attractive LBO candidate. If the target firm also has cash in excess of working capital needs and a strong performance record, the capacity for debt increases even more. These are all factors that PE firms should take into account before selecting a target.

Second, PE firms prefer targets that have a strong and highly motivated management team. When there is already a competent management team in place, PE firms can decide to keep running the business by the old managers. Acharya, Hahn & Kehoe (2009) argue that companies with an entrenched management team promise the highest improvements and prefer low leverage. The management preference for low leverage, however, could be a substantial problem for PE firms to apply financial changes in the capital structure. Therefore, the management must also be highly motivated by the prospect of substantial financial gains, which PE firms normally solve by giving the management the opportunity to own a portion of the firm's equity (Acharya et al., 2009).

The fundamentals of a target, such as stability, limited competition, attractive industry and high growth potential are also critical factors for the LBO to become a success. According to Cornelius, Juttman and de Veer (2009) typical targets are settled in mature and stable growing industries that are not dependent on technologies or production processes that are subject to rapid change. He gives industries as manufacturing, retailing, textiles, food processing, apparel and soft drinks as examples and continues that these kind of industries usually can be characterized by large intangible book values, high growth potential, stable cash flows, and limited R&D, new product, or technology spending.

Finally, a robust financial profile is a critical factor for success. Oppler and Titman (1993) analyze 180 US companies, which undertook an IPO between 1980-1984 and 1985-1990. They find evidence that firms with high free cash flows are good candidates for LBOs. Firms that have stable and predictable free cash flows will be more likely to service their interest

and debt payments after the acquisition. In addition, it would be easier for these firms to raise outside debt financing, since there is less risk of financial distress. The analysis of Acharya et al. (2009) support the expectation that PE firms select companies with a robust financial profile. In their dataset of 110 Western European PE LBOs, they find evidence that PE firms select companies in a segment with relatively high EBITDA levels and the high EBITDA compensates for the increase in leverage during PE ownership.

(ii) Not overpaying

A second critical factor that contributes to the success buyouts is “not overpaying”. Much of the empirical research suggests that, whether it’s a buyout or another form of acquisition, the acquirer needs to be careful with paying a too high price for the deal. Overpaying for LBOs means less value is created from the deal (Koller, Dobbs and Bill, 2010). But more important, overpaying for LBOs increases the probability of financial distress. Axelson, Jenkinson, Strömberg & Weisbach (2013) find evidence that high transaction prices are associated with higher deal leverage and lower buyout fund returns, suggesting that acquirers overpay when access to credit is easier. However, if the acquired firm fails to meet its debt service obligations in a timely fashion, the firm is often required to renegotiate the terms of the loan agreements with the lenders (DePamphilis, 2014) If both parties cannot come to an agreement, the firm may be forced to file for bankruptcy, often wiping out the initial investors. In addition, competitors understand that taking on large amounts of debt increases the breakeven point for the buyout firm. This could result in cutting product prices by competitors, who want to gain market share and know about the buyout firm’s inflexibility to follow their actions as the firm needs to meet required interest and principal payments.

(iii) Exit is key

Third, a PE firm needs to be sure that it can exit the business through selling it, as the divestment phase is crucial for the overall performance. One can choose to exit the business in a number of ways: Initial public offering (i.e. taking the firm public), sale (i.e. trade sale, a secondary buyout or a buyback), and write-offs (i.e. liquidating).

A large literature investigating the exiting of PE investments shows that initial public offerings are not the most common route of selling the company. Initial public offerings, where the company is listed on a public stock exchange and the PE firm can subsequently sell its shares in the public market, only accounted for 14% of exits (Kaplan & Strömberg, 2009). It

seems to be that this exit strategy is mainly used by highly profitable PCs. Schwienbacher (2002) finds evidence that there is a positive relationship between the profitability of PCs and the likelihood of going public. Only the PCs that are characterized by a convincing equity story and high growth prospects will go public. This because unsuccessful PCs will mostly not be able to comply with the requirements needed for listing. In addition, the transaction costs of IPOs are generally very high which is also a disadvantage for unprofitable PCs. Nevertheless, as pointed out by Giot & Schwienbacher (2007), an IPO is still regarded as the most profitable exit route among PE investments.

A more common route of exiting PE investments is selling the company to a strategic buyer (also referred to as acquisitions or trade sales). Furthermore, sales can be subdivided into secondary buyouts and buybacks. The former refers to the sale to another PE-firm and the latter refers to the repurchase by the old owner or management. As pointed out by Schmidt, Steffen & Szabó (2010) selling the business is quick and simple. There are less restrictions compared to IPOs and the possibility to influence the investment according to the needs of strategic investors. Cumming & MacIntosh (2003) show that a trade sale is regarded as the most used exit vehicle and the most profitable amongst all types of sales. By contrast, secondary buyouts and buybacks are regarded as less preferred (Schmidt et al., 2010). This because these exit vehicles are most often associated with lower returns.

Finally, write-offs occur when the investments of PE firms are underperforming and have a negative effect on their performance and reputation. Cumming and MacIntosh (2003) argue that PE firms will not stick to underperforming companies as that would signal their inability to differentiate between good and bad investments. In order to minimize the portfolio failure ratio, PE firms write off underperforming investments and drop them out of their portfolio (Schmidt et al., 2010). Cumming & MacIntosh (2003) support this strategy by showing that a shorter holding period is associated with an increased probability of a write-off. Nevertheless, a write-off should be regarded as a different exit vehicle as writing off an investment is more a constraint than an option.

(iv) Improving PCs' performance

The final critical factor that contributes to the success of buyouts is improving the PC's post-buyout performance. PE firms improve performance by applying three sets of changes to the PCs in which they invest. These can be categorized as financial engineering (i.e. the optimization of capital structure and minimization of after-tax cost of capital), governance engineering (i.e. improving the control of their PCs' boards), and operational engineering (i.e.

improving operational efficiency). These mechanisms trigger a corporate restructuring process leading to significant and rapid changes in the firm's capital structure, assets and organizational structure and the corporate governance regime (Berg & Gottschalg, 2005). Because of the long-investment horizon, PE firms have more time to put controls and reporting-monitoring systems in place, thereby enhancing the financial performance and generate real gains in the value of the acquired company. In other words, PE investors try to influence the strategy of their PCs in order to improve the value of the company. A large literature has illustrated these sets of changes and show a number of ways through which buyouts increases or decreases in company value. In the next section, these levers of value creation will be explained in more detail.

2.2 How do LBOs create value?

Since the breakthrough of buyouts in the mid-1980s and the increasing importance of PE as an assets class, academic research spun off on the performance of PE funds. However, despite the growth of academic research, little consensus has been reached about the main factors influencing the returns of PE investments. This is largely due to the fact that most PE firms are exempt of public disclosure requirements and only have a few incentives to expose themselves to the market. Only the top performing market participants that achieve above average returns disclose the performance of their funds. One can imagine that this results in a lack of reliable return data and makes it very hard for researchers to do their work. Nevertheless, other fields of academic research increasingly analyzed the ways in which PE investors add value to the PCs they invest in. The highlights of this (global) research stream are the financial, governance and operational changes that PE firms set to their PCs in order to improve performance. The following subsections discuss these levers of value generation in more detail. In addition, the related empirical literature will be reviewed in order to further understand the implications of these mechanisms.

2.2.1 Financial engineering

One of the most widely acknowledged mechanisms of value creation that PE firms set to their PC's is financial engineering. This is the practice of optimizing the PC's capital structure and minimizing its after-tax cost of capital (Berg & Gottschalg, 2005). This strategy was common during the first wave of buyouts – in times that PE firms could finance buyout transactions with a relatively large portion of debt. The key benefits of this strategy are the reduction of marginal agency costs and increasing tax savings (Jensen, 1986; Harris, Siegel & Wright, 2005;

Renneboog, Simons & Wright, 2007).

PE investors typically use their financial expertise to assist the PC improving its complex capital structure and to find an optimal mix between debt and equity. One can imagine that this leads to an increase in debt, hence the term ‘leveraged buyout’. By substantially leveraging the capital structure, PE firms create pressure on managers not to waste money. This because managers must service interest and debt payments rather than spend it inefficiently within the firm. Thus from an agency perspective, proponents of PE argue that financial engineering reduces the ‘ free cash flow’ problems as described by Jensen (1986) and plays a crucial role in the limitation of managerial discretion over inefficient capital expenditures (Kaplan, 1989). By contrast, critics of PE often argue that financial engineering raises the chances of costly financial distress and could lead to a short-term performance focus (Berg & Gottschalg, 2005).

Another consequence of increasing leverage that has been identified as an source of value creation in buyouts is the saving of corporate taxes. Proponents of this strategy argue that increased debt makes high tax-deductible interest payments necessary and provides a tax shield with a positive impact on cash flows. Renneboog, Simons & Wright (2007) analyze the sources of the expected shareholder gains in UK public to private transactions in the second wave from 1997 to 2003. They find evidence that the main sources of value creation are undervaluation of the pre-transaction target firm, increased tax shields, and incentive realignment. By contrast, critics of the tax-saving argument clarify that this benefit is almost entirely offset by the higher cost of that increased debt, thereby making the cost of capital more or less independent of leverage (Long & Ravenscraft, 1993; Opler & Titman, 1993).

2.2.2 Governance engineering

Governance engineering refers to the way that PE firms control the boards of their PCs and apply a more active ownership and governance approach than boards of public listed companies (PLC). Previous literature studying the differences between the PE and PLC models of governance show that PE boards are smaller and have more formal meetings per year than comparable PLCs (Cornelli & Karakas, 2008; Acharya et al., 2013). Acharya et al. (2013) analyzed the boards of 66 buyout firms in the UK and compared these with boards of similar PLCs. Their results show that PE boards are smaller by about two members, have twelve formal meetings per year and many more informal meetings. To understand the origin of these differences, Acharya et al. (2013) interviewed in-depth general partners involved in 48 of their

66 deals. They argue that PE boards have a more value creation focus whereas PLC boards have a more governance compliance and risk management focus.

To execute the value-creation plan efficiently, PE boards change the composition of the board with the aim of concentrating ownership (Nikoslainen & Wright, 2007). This improves the PE firm's monitoring and control over the PC. In addition, PE firms apply powerful management incentive schemes using significant equity and options-based stakes for top management (and often even to other employees), requiring the management to make a meaningful investment in the company. In this way, the management not only has a significant upside, but a significant downside as well. This will in turn reduce agency costs for the GP. If managers are still showing a poorly performance, Acharya et al. (2013) argue that PE firms do not hesitate to replace them. Their results show that 33% of their deals have CEO replacement in the first 100 days, and 61% are replaced at some point during the deal.

To summarize, GPs involved in PE deals pay careful attention to management incentives in order to align the interests of the PE firm and the management. The theory suggests that the abnormally positive performance of buyout firms is at least partly due to highly leveraged capital structures and active ownership and governance of PE firms. Furthermore, these changes in organizational structure and ownership can reduce the principal agent problem significantly. However, these levers of value generation were particularly common in the 1980s. During the 1990s, markets became more mature and increasingly competitive. PE firms realized that they had to evolve their management models and find other ways to add value to their PCs beyond financial and governance engineering (Berg & Gottschalg, 2005). In today's buyouts, PE firms add another piece to their model that is called "operational engineering".

2.2.3 Operational engineering

While financial and governance engineering continues to be important, it is not the main differentiating factor that it used to be. Starting in the late 1980s, the PE industry became increasingly competitive with buyout firms bidding against each other to do the financial and governance engineering. To seize the highly competitiveness within the industry, PE firms had to enlarge their financial and governance engineering capabilities. In the transition to the second wave, PE firms responded to these changes by developing operating capabilities they could use to add value to their PCs, which nowadays is referred as operational engineering (Kaplan, 2009).

Where financial engineering is focused on the right side of the balance sheet (i.e. capital

structure and cost of capital), operational engineering is focused on the left side of the balance sheet (i.e. the operational effectiveness of the PC). It refers to the way that PE investors add value to the operations of their PC using their industry and operational expertise. To enlarge their industry and operational expertise, PE firms often hire “operating partners” with a high reputation that already are experienced in their respective industries (Kaplan, 2009). In addition, most top PE firms also make use of internal and external consulting groups (Kaplan & Strömberg, 2009). By hiring talented consultants that have operating expertise in their respective industries, PE firms can use their knowledge to identify attractive investments, and to develop and implement a value creation plan at the time of investment. Ways to create value and improve the operational effectiveness of the PC might include enhancing overall productivity and operational efficiency. One can think of firm-specific improvements, such as cost-cutting and margin improvements, eliminate unproductive assets, use remaining assets (including working capital) more efficiently, or make value-increasing acquisitions (Guo, Hotchkiss & Song, 2011).

2.2.3 Empirical findings on post-buyout performance

The empirical evidence on the post-buyout operating performance of acquired companies is largely positive. In the first major study of the operating performance of MBOs, Kaplan (1989) analyzes the post-buyout performance of 48 large deals completed between 1980 and 1986 from year -1 to +3 after the buyout. He finds evidence that in the first three post-buyout years, the median industry-adjusted net cash flow was 22%, 43% and 81% larger than in the last-pre buyout year. Consistent with the Jensen’s hypothesis, the increases in net cash flow were driven by both increases in operating income and by decreases in capital expenditures. Kaplan also finds that these changes are associated with large increases in firm value. Smith (1990) finds similar results. In her sample of 58 MBOs of U.S. public companies during 1977–1986, Smith analyzes the changes in operating performance on the basis of operating cash flows before interest and taxes, scaled by operating assets and by the number of employees. She finds evidence that the ratio of cash flows both to employees and operating assets increased on average after an MBO due to better working capital management. The increases in operational cash flows were associated with increased buyout-induced leverage and management ownership.

Lichtenberg and Siegel (1990) analyze the post-buyout productivity of approximately 1000 LBOs of U.S. manufacturing plants between 1981-1986. They find evidence that plant

productivity increased from 2% above industry mean in the three pre-buyout years to 8% above industry mean in the three post-buyout years. Moreover, the authors show that the wealth gains were not attributed to reductions in R&D, wages, or capital investment. In a more recent study, Harris, Siegel, and Wright (2005) examine 35.752 MBOs of manufacturing plants in the U.K. between 1982-1998. On average, they find that plants involved in MBOs were 2% less productive than other plants in the same industry before experiencing a buyout. However, consistent with Lichtenberg and Siegel (1990), Harris et al. (2005) find evidence that MBO plants experienced a substantial increase of 71% to 90% in total productivity after the buyout.

While most of the formerly mentioned literature focuses on LBOs completed between 1980-1989, Guo et al. (2011) show that LBOs completed in the most recent wave of public to private transactions differ in a number of important respects. In their sample of 192 U.S. buyouts completed between 1990- 2006, the authors find modest increases in operating and cash flow margins that are much smaller than those found in U.S. data in the 1980s. The post-buyout operating gains of the acquired companies are either comparable to or slightly higher than those observed for comparable firms matched by industry and pre-buyout characteristics. In addition, Guo et al (2011) show that these deals are somewhat more cautiously priced and less highly leveraged than their predecessors from the 1980s. These findings suggest that cash flow performance is greater when firms can take more leverage.

Overall, these findings suggest that financial, governance and operational engineering play an important role in value creation of LBOs. Whilst this emphasizes the ability of PE firms to add value to their investees, these studies seem to bypass the effects of investment strategy differences amongst PE firms. This thesis addresses the issue whether the degree of PE firm specialization by industry or stage has a significant impact on post-buyout performance of acquired companies. Therefore, the next section will be entirely devoted to strategic differences between PE firms.

2.3 The specialization effect in PE

As formerly mentioned, the ensuing competition since the mid '90s created pressure on PE firms to redefine their investment strategies. Some PE firms started to select their investments based on specific industries or stage of development, with the idea of gaining deeper industry or stage expertise (i.e. specialists), while others hang on the traditional finance theory which suggests that portfolios should be diversified over several companies and different industries to minimize unsystematic risk (i.e. generalists). Therefore, the question remains what theoretical

reasons PE firms have for specialization? In the next section, the possible investment strategy differences amongst PE firms and their possible impact on the selection and post-buyout performance of PCs will be described in more detail.

2.3.1 Specialists vs. generalists

Cressy et al. (2007) argues that there are two advantages of being specialized in particular industries or financing stages. First, specialists experience reduced information asymmetries as the firm learns more about e.g. the average company's 'private' probability of success in that industry or stage. Second, as the firm gains more in-depth knowledge of companies in that industry or stage, the firm benefits from reduced uncertainty. As a result, Cressy et al. (2007) argue that specialists are expected to possess a deeper knowledge of the competitive environment of PCs and of their companies' strengths and weaknesses and can therefore make superior selection decisions regarding potential investments. In addition, specialists are expected to provide more effective monitoring and advice, thereby adding more value to their PCs compared to diversified PE firms. This should in turn be associated with superior post-buyout performance of acquired companies.

These advantages are in line with research done by Lossen (2007). In his research it is stated that, as a consequence of information asymmetry and agent problems, specialized PE firms enjoy at least three advantages compared to non-specialized PE firms. First, before PE firms decide whether or not to invest in a potential PC, they run a tight and multi-stage selection process. During this selection process, PE firms face a substantial information asymmetry compared to the management team or the current owner of the potential target. However, if PE firms are specialized in the technology and business of the potential PC, this information gap will become smaller and thus improve the PE firm's ability to distinguish successful from unsuccessful investments. The second advantage that is given is related to the principal agent problem that arises once a PE firm starts financing a company. In earlier sections it was mentioned that GPs pay careful attention to management incentives in order to align the interests of the PE firm and the management. By substantially leveraging the capital structure and the use of powerful management incentive schemes, PE firms keep managers on a "tight leash" and reducing potential losses from bad decisions. Lossen (2007) argues that the more knowledge PE firms have about the industry and markets of the PC, the more effectively it is able to raise debt financing from financial institutions. In addition, specialized PE firms will be able to execute control rights more effectively (Kaplan & Strömberg, 2009). Third, it was

mentioned that PE firms involve themselves in the managerial activities of PCs in order to add value to their investments. Again, Lossen (2007) argues that the deeper the knowledge PE firms possess of their PC's activities, the more value adding services PE firms should be able to offer.

In other words, specialized PE firms should be able to apply more effective financial, governance, and operational engineering compared to generalized PE firms. As a consequence, PE firms specialized in specific financing stages and industries should in turn experience greater rates of returns and post-buyout performance of acquired companies. However, several considerations regarding this theory should be taken into account. First, critics of specialization argue that this increases costs due to reduced portfolio diversification. From a generalist point of view, constructing a well-diversified portfolio will eliminate all unsystematic risk (i.e. risk that arises from firm, industry, or other asset-specific assets). This will leave the PE firm only exposed to systematic risk influences (i.e. risk that arises from the effects of market or economic-wide influences). Norton and Tenenbaum (1993) state that with a well-diversified portfolio, one can balance unfortunate circumstances that hurts return on some PCs by situations that increase returns on other PCs.

Second, generalists can offset the advantage of having specialized expertise by syndicating on a deal or hiring specialists from outside the PE firm. By syndicating on a deal, investors are able to share their specific knowledge and complementary skills and as a result add more value to the PC (Meuleman et al., 2009). In addition, syndication indicates that financial risk will be spread between two or more investors, thereby increasing the gains of portfolio diversification (Manigart et al., 2006). When it comes to hiring specialists from outside the firm, Berg & Gottschalg (2003) state that PE firms add value to investees by using their extensive network of contacts in various industries and especially in the financial and consulting markets that can be exploited to the benefit of the buyout transaction. The authors argue that contacts of the PE firms may help to find promising business partners, to search and to recruit new managers for PCs or to identify attractive PCs for buy-and-build strategies. This is in line with theory described earlier in this chapter (Kaplan & Strömberg, 2009).

Third, Acharya et al. (2009) argued that PE firms select targets where there's already a competent management team in place. In other words, it can be argued that the target's managers are already experts themselves in their respective industry or financial stage. They have their own technological, market and product expertise, as well as networks comprising experts and investors with similar interests. This might offset the advantage that specialized PE firms have over not so-specialized PE firms since the latter group can benefit from the buyout companies' skills and expertise by allowing the PC's management to implement the operational

changes and doing the financial and governance engineering themselves.

2.3.2 Empirical findings on the specialization effect in PE

The role of PE specialization –measured primarily in terms of its industry and stage focus – on the performance of PE funds and post-buyout performance of acquired companies has been examined in various empirical studies. Norton & Tenenbaum (1993) examined whether VCs attempt to control risk through competing portfolio strategies by reviewing responses to a survey completed by 98 VCs. In contrast to the traditional finance theory, which suggest that portfolio diversification is a method to reduce unsystematic risk, the authors argue that VCs seem to benefit from the opposite. Norton & Tenenbaum's (1993) research shows that VCs control portfolio risk by specializing in certain industries and financing stages, rather than stagger their investments over different industries and stages. In addition, Norton & Tenenbaum (1993) find evidence that these firms experience higher returns than comparable non-specialized VCs due to extensive technical and product expertise in their area of specialization. These findings are supported by research done by Gompers et al. (2008). In their sample of 2.179 U.S. VCs investing in 16.140 companies, Gompers et al. (2008) find evidence that specialized VCs with greater industry-specific experience and human capital tend to respond more quickly to new investment opportunities. In addition, these investments tend to be more successful compared to investments of less experienced VCs, measured by a greater likelihood of profitable exit (i.e. IPO, acquisition, merger). Overall, these papers support the specialization hypothesis, which proposes a negative relationship between the level of diversification and the rate of return (PME and IRR) of a PE fund. Consequently, the percentage of PCs with negative returns should be lower for specialized funds.

In relation to this hypothesis, some contradictory evidence has been provided. Aigner et al. (2008) analyzed the performance of 104 PE funds, where 55.22% of the total investments accounts for U.S funds and 44.78% for European. In line with research done by Ljungqvist and Richards (2003), Lossen (2007) and Brigl, Herrera, Liechtenstein, Meerkatt, Prats & Rose (2008), Aigner et al (2008) could not find any significant impact of industry diversification on fund returns. However, in contrast to these papers, Aigner et al. (2008) find a significantly positive influence of diversification across financial stages on fund returns. In addition, the authors find evidence that an increase in diversification across financing stages decreases the percentage of PCs that generate losses. This result is not in line with the specialization hypothesis, which suggests that the percentage of PCs with negative returns should be higher

for generalized PE funds. A possible explanation for this observation could be that the benefits of additional investment opportunities in various financing stages are higher than the costs of diversification.

Overall, the findings on the impact of diversification on the performance of PE funds show quite inconclusive results so far. In addition, it should be noted that the studies of Norton & Tenenbaum (1993) and Gompers et al. (2008) analyzed VC performance, which is not the focus of this thesis. As regards to the studies that examine PE performance, a large part shows that the influence of diversification on the performance of PE funds is rather limited. Despite the specialization theory, the effects of industry or buyout specialization are unclear and in most papers statistically not significant. Lossen (2007) argues that the advantage of PE firms specialized in particular industries to overcome information asymmetries and principal agent problems could be limited. Just as mentioned by Berg & Gottschalg (2003), either the specialized expertise is less important as assumed or the expertise can be purchased from specialists outside the firm. In addition, Aigner et al. (2008) argue that PE funds are often specialized within their organization. In other words, there might be experts for the different financing stages and industries who, together, create a diversified and well-performing organization.

Nevertheless, the previous empirical studies document the considerable effects of PE specialization on fund performance. These studies, however, largely ignore the possible impact of PE specialization on the post-buyout economic performance of acquired companies. Two papers that relate the most to this thesis is the work done by Cressy et al. (2007) and Meuleman et al. (2009). First, Cressy et al. (2007) examine whether relative investment specialization of PE firms compared to its peers is associated with superior post-buyout performance of acquired companies. In their sample of 122 U.K buyouts over the period 1995-2000 and a matched sample of non-PE-backed U.K. companies, Cressy et al. (2007) find evidence that operating profits of companies backed by PE firms are 4.5% higher than those of comparable non-buyout companies over the first 3 post-buyout years. More interesting, industry specialized PE firms raise this difference by an additional 8.5%, thereby lending support to the expectation that industry-specialized PE firms perform better than not so-specialized PE firms. In testing their advantage-to-stage specialization hypothesis, Cressy et al. (2007) do not find any significant effects on post-buyout-performance. Second, Meuleman et al. (2009) study how the involvement of PE firms is related to the post-buyout performance of investees. In their sample of 238 PE-backed buyouts in the U.K between 1993 and 2003, Meuleman et al. (2009) control for the effect of PE industry specialization on post-buyout performance. However, the authors

could not find any significant effect of PE industry specialization on improvements in efficiency or growth whilst using the same metrics as described in Cressy et al (2007).

2.4 Conclusion

This thesis attempts to provide an answer on the question whether relative investment specialization by PE firms compared to its peers is associated with superior performance of acquired companies. However, before any conclusions can be drawn, a thorough understanding of the LBO is necessary. To summarize, the first section showed a large number of factors that contribute to the success of LBOs. In analyzing the academic research on LBOs, I identified “target selection, not overpaying, having a good exit strategy and improving post-buyout operating performance” as the most important factors that lie beneath the success of LBOs.

To gain a deeper understanding of the performance of buyout firms following the buyout, section two provided a closer examination of the different levers of value creation in buyouts that has received substantial attention in the literature. The highlights of this research suggests that PE firms add value to their PCs by applying three sets of changes, which can be categorized as financial, governance, and operational engineering. However, the enormous growth of competition in the PE industry since the mid-90’s and continuing changing market conditions created pressure on PE firms to enlarge their focus on operational engineering. PE firms responded to these changes by specializing on specific industries or financial stages, with the idea of gaining deeper industry or stage expertise.

In today’s buyouts the question remains whether this increased specialization focus of PE firms is associated with superior performance. The last section therefore provided a detailed overview of the pro’s and con’s of being specialized in certain industries or financial stages. By means of specialization, the literature suggests that PE firms should be able to make superior selection decisions and to provide their PCs with more value adding services which in turn improves PE funds’ performance. However, a large part of the literature only focusses on the impact of PE specialization on fund returns, whereas the empirical evidence on the relationship between PE specialization and post-buyout performance of acquired companies is rather scarce. First, Cressy et al. (2007) found support for the advantage-to-industry specialization hypothesis – a significant positive relationship between industry specialization and post-buyout operating profitability. However, the authors could not find any significant evidence to support the expectation that PE stage specialization matters if it comes to improving buyout performance. Second, Meuleman et al. (2009) examined the effect of PE industry specialization on post-

buyout efficiency or growth but no significant relationships were found.

Overall, the conclusion can be made that little consensus on the effect of PE specialization has been reached so far. Cressy et al.'s (2007) suggestions for future research are to gain a deeper understanding of PE specialization in other countries than the U.K, where the PE industry has already entered its maturity phase and PE firms have had the opportunity to build relevant experience. Hence, the following chapters will contribute to the literature that has examined the relationship between PE specialization and post-buyout performance of acquired companies, by focusing on PE investments occurred between 2003-2011. In addition, this thesis will contribute to the research that is conducted on buyouts in the Benelux.

Table 1

Summary of the most important theories

Section	Article	Subject/Theory
2.2.1	Kaplan, 1989	<u>(i) Financial engineering</u> From an agency perspective, financial engineering reduces the 'free cash flow' problems as described by Jensen (1986) and plays a crucial role in the limitation of managerial discretion over inefficient capital expenditures.
2.2.1	Berg & Gottschalg, 2005	Increased debt makes high tax-deductible interest payments necessary and provides a tax shield with a positive impact on cash flows.
2.2.2	Acharya et al., 2013	<u>(ii) Governance engineering</u> PE boards have a more value creation focus whereas PLC boards have a more governance compliance and risk management focus.
2.2.2	Nikoslainen & Wright, 2007	PE boards change the composition of the board with the aim of concentrating ownership. This improves the PE firm's monitoring and control over the PC.
2.2.2	Acharya et al., 2013	PE firms apply powerful management incentive schemes using significant equity and options-based stakes for top management, requiring the management to make a meaningful investment in the company. In this way, the management not only has a significant upside, but a significant downside as well.
2.2.3	Kaplan, 2009	<u>(iii) Operational Engineering</u> To enlarge their industry and operational expertise, PE firms often hire "operating partners" with a high reputation that already are experienced in their respective industries.
2.2.3	Kaplan & Strömberg, 2009	By hiring talented consultants that have operating expertise in their respective industries, PE firms can use their knowledge to identify attractive investments, and to develop and implement

		a value creation plan at the time of investment.
2.2.3	Guo, et al., 2011	Ways to create value and improve the operational effectiveness of the PC might include enhancing overall productivity and operational efficiency.
2.3.1	Cressy et al., 2007	<u>(iv) Proponents of PE specialization</u> Specialists are expected to possess a deeper knowledge of the competitive environment of PCs and of their companies' strengths and weaknesses and can therefore make superior selection decisions regarding potential investments.
2.3.1	Kaplan & Strömberg, 2009	Specialized PE firms will be able to execute control rights more effectively.
2.3.1	Norton & Tenenbaum, 1993	<u>(v) Critics of PE specialization</u> Critics of specialization argue that this increases costs due to reduced portfolio diversification. With a well-diversified portfolio, one can balance unfortunate circumstances that hurts return on some PCs by situations that increase returns on other PCs.
2.3.1	Berg & Gottschalg, 2003	PE firms add value to investees by using their extensive network of contacts in various industries and especially in the financial and consulting markets that can be exploited to the benefit of the buyout transaction.
2.3.1	Acharya et al., 2009	PE firms select targets where there's already a competent management team in place. In other words, it can be argued that the target's managers are already experts themselves in their respective industry or financial stage.
2.3.2	Aigner et al. (2008)	PE funds are often specialized within their organization. In other words, there might be experts for the different financing stages and industries who, together, create a diversified and well-performing organization.

3. EMPIRICAL RESEARCH

This chapter provides a quantitative research regarding the effect of PE specialization on the performance of LBO companies in the Benelux. The main goal is to provide an answer on the question whether buyout firms backed by industry or stage specialized PE firms experience higher post-buyout operating performance compared to buyout firms backed by non-specialized PE firms. The first section provides a detailed description of the methodology and data sample. This includes the research design, hypotheses, data sources and constructed variables. The section that follows provides an extensive analysis of the data and results. Finally, the last section consists of a conclusion of this chapter.

3.1 Methodology and data

3.1.1 Research design

Previous literature investigating operating performance of buyouts provides useful help in setting up an appropriate research methodology. The research design used in this study is in line with previous research on buyouts (Kaplan, 1989; Bergström, Grubb & Jonsson, 2007; Cressy et al., 2007; Guo et al., 2011; Acharya et al., 2012; Alperovych, Amess & Wright, 2013). The aim is to assess and explain operational improvements in buyout companies generated by specialized or generalized PE firms that are in excess of any general improvements in operating performance of the company's industry.

(i) Performance indicators

The research method is to measure post-buyout *turnover growth* and *operating profitability* by means of using the following set of performance indicators: sales (turnover growth), earnings before interest and taxes scaled by sales (EBIT/Sales) or total assets (EBIT/Assets) and earnings before interests, taxes, depreciation of tangible assets and amortization of intangible assets scaled by sales (EBITDA/Sales) or total assets (EBITDA/Assets).

Turnover growth is widely used in previous research as a measure of economic performance at company level, although it includes some drawbacks. Bergström et al. (2007) argue that additional sales could generate cash flows for the PC to service its high debt burden. However, due to the incentives of management ownership and the debt burden, companies owned by PE firms still have less financial flexibility compared to their public peer groups. When comparing the post-buyout sales growth of PCs with the benchmark, it can be expected

that peer companies grow faster. Nevertheless, this performance indicator can be used to examine if the buyout company is aimed towards a growth strategy. Therefore, I examine the change in sales after the buyout.

Operating profitability is the more important of the two and is strictly the one that tests for economic efficiency à la Jensen (Cressy et al., 2007). Performance indicators that are employed to measure the effect are EBIT/Sales, EBIT/Assets, EBITDA/Sales and EBITDA/Assets. These measures of operating profitability and efficiency concentrate on the ability of the PE firm to improve the operational effectiveness of the PC. As mentioned in the literature, this includes cost-cutting and margin improvements, the elimination of unproductive assets, the more efficiently use of remaining assets, or making value-increasing acquisitions. There are some advantages of using EBIT and EBITDA as operating performance statistics. Acharya et al. (2009) state that EBIT is, in contrast to 'net income', not distorted by expenses outside of a company's business (interest and taxes). Another measure of the firm's fundamental operational earnings is EBITDA. However, critics of EBITDA argue that this measure distorts from reality since it averages out non-cash charges which are due to the allocation of historical cost of an asset (depreciation and amortization). In addition, EBITDA does account for working capital requirements of a business. Nevertheless, since this performance measure is widely used in the literature as a proxy for cashflows, I also include EBITDA. Furthermore, the advantage of using a profitability metric scaled by assets rather than say Return on Assets (ROA) is that it averages out the effects of financial engineering (Cressy et al., 2007).

(ii) Time window

As this study measures the post-buyout operating performance improvements, the formerly described performance indicators are being observed from years 0 to +3 after the buyout. Following previous research, measuring the economic performance of the acquired companies in a three year period after the buyout should suffice (Cressy et al., 2007; Meuleman et al., 2009; Alperovych et al., 2013). An often encountered challenge with buyout research is that accounting information isn't available for private companies. However, unlike in the U.S., European companies are required to disclose their financials. This doesn't mean that all accounting information is publically and freely available, but it does provide a promising thought that sufficient data can be collected from various databases.

Furthermore, this study is based on buyouts occurring in the period 2003 to 2011. The rationale for the time window of 2003 to 2011 can be explained by three different motives. First, as described in the literature PE firms adjusted their engineering focus due to the ensuing

competition in the mid '90s. In today's buyouts, financial and governance engineering continues to be important, but operational engineering is seen as the most important value creation lever. Therefore, it is primarily this operational engineering focus of PE firms that this study is interested in. Second, this time window includes both pre-crisis- and post-crisis buyout performance of companies, which makes this study very interesting because it takes into account the effects of the financial crisis on buyout performance. Lastly, as the geographical research scope is limited to the Benelux, taking a longer time horizon will allow for sufficient observations to be included in the sample.

(iii) Industry adjustment

The performance of a company is likely to be affected not only by the buyout, but also macro factors or other factors affecting the entire industry. In order to assess whether changes in operating performance are due to industry or company specific factors, this study also measures the changes in performance indicators of the industries in which the buyouts have taken place. Cressy et al. (2007) constructed a control group of private companies matched by the buyout companies in terms of industry and size². The authors argue that by controlling for industry and size across the two groups, one can minimize the influence of systematic risk. However, matching each target company by one similar company in terms of total sales in the year of the buyout could lead to biases in results. To forestall these biases, this thesis follows a slightly different approach. Instead of identifying one similar company, I will assign each buyout company a peer group of ten similar companies in terms of size and industry and calculate the changes in performance indicators for each company. In the end, the median of each performance indicator of the peer group as whole is calculated in order to compare the development of operating improvements in the buyout company and the respective industry³. The methodology to control for industry influences this way is the standard in comparable research (Kaplan, 1989; Bergström et al. 2007; Guo et al., 2011; Alperovych et al., 2013).

3.1.2 Hypotheses

In this chapter ten hypotheses are tested. Following previous research on post-buyout

² Cressy et al. (2007) formed a list of all private companies in the same industry according to their NACE 4-digit industry classification. From this list, they chose the company that was most similar to the PE-backed company in terms total sales in the year of the buyout.

³ The median of the performance indicators of the peer group is used instead of the average in order to remove the effect of outliers in the operating statistics of the industry.

performance of acquired companies, all hypotheses are based on the changes in performance indicators for the LBO sample. In the literature, I identified two investments strategies of the lead PE firm by means of specialization. The first strategy refers to the focus of the PE firm's investments in a particular industry relative to other PE firms. The second strategy refers to the focus of the PE firm's portfolio by buyout stage relative to other PE firms⁴.

First, this thesis attempts to examine whether industry specialized PE firms improve post-buyout turnover growth of the PC's they invest in. Cressy et al. (2007) did not find conclusive evidence for PE industry specialization to be beneficial for turnover growth. However, this research examines a different dataset in a time period where PE specialization was becoming increasingly popular. Therefore, I will pursue the expectations of Cressy et al. (2007) and formulate a similar hypothesis.

H 1. Greater PE firm industry specialization is associated with an improvement in post-buyout turnover growth.

Second, this thesis focuses on the post-buyout profitability of the acquired firm. This will be measured by changes in EBIT scaled by sales or total assets. Cressy et al. (2007) argues that dividing EBIT by sales or assets will account for firm size. In addition, by looking at changes in these performance indicators I can test for increased efficiency. Cressy et al. (2007) found conclusive evidence for PE industry specialization to be beneficial for post-buyout operating profitability. Therefore, I will expect the same results for buyouts in the Benelux. This leads to the following two hypotheses.

H 2. Greater PE firm industry specialization is associated with an improvement in post-buyout operating profitability, measured as $(EBIT/Sales)*100$

H 3. Greater PE firm industry specialization is associated with an improvement in post-buyout operating profitability, measured as $(EBIT/Assets)*100$.

As regards to PE specialization by buyout/acquisition stage, Cressy et al. (2007) did not found conclusive results once more. The expectation was that the post-buyout performance in terms of turnover growth or operating profitability would be higher if the lead PE firm was specialized in the buyout stage of the acquired company. The same as with Hypothesis 1, this research

⁴ For more information, see footnote 7.

attempts to prove a positive relationship, since the dataset and time frame differ compared to Cressy et al. (2007).

- H 4.** Greater PE firm stage specialization is associated with an improvement in post-buyout turnover growth
- H 5.** Greater PE firm stage specialization is associated with an improvement in post-buyout operating profitability, measured as $(EBIT/Sales)*100$.
- H 6.** Greater PE firm stage specialization is associated with an improvement in post-buyout operating profitability, measured as $(EBIT/Assets)*100$.

Finally, for the robustness of the results it is preferred to account not only for differences in EBIT related performance indicators, but also EBITDA related performance indicators (Acharya et al. (2009), which leads to four similar hypotheses.

- H 7.** Greater PE firm industry specialization is associated with an improvement in post-buyout operating profitability, measured as $(EBITDA/Sales)* 100$.
- H 8.** Greater PE firm industry specialization is associated with an improvement in post-buyout operating profitability, measured as $(EBITDA/Assets)* 100$.
- H 9.** Greater PE firm stage specialization is associated with an improvement in post buyout operating profitability, measured as $(EBITDA/Sales)* 100$.
- H 10.** Greater PE firm stage specialization is associated with an improvement in post buyout operating profitability, measured as $(EBITDA/Assets)* 100$.

3.1.3 Sample and data sources

The formerly described methods and hypotheses require a large amount of data, encompassing information on buyout transactions and dates, accounting information for the target companies, and industry wide financials in order to control for industry dynamics. The following section provides a step-by-step explanation of the data collection process. Thereafter, a detailed description of the constructed variables will follow.

As discussed in the introduction of this paper, the decision has been made to focus on the PE industry in the Benelux. This because a large literature investigating the economic

effects of buyouts was mainly focused on the U.S. and U.K. (Cressy et al., 2007). In order to test the hypotheses, a unique dataset has been created consisting of PE-backed buyout deals in the Benelux over the period 2003-2011. The process of constructing the data sample can be divided into four phases.

In the first phase, the initial sample of buyouts completed in the Benelux from 2003 to 2011 was selected from Zephyr, a commercial database managed by Bureau van Dijk (BVD), containing merger and acquisition data worldwide. In the selection process, the following criteria were included. First, the head office of the buyout company had to be located in the Benelux. Second, to exclude performance effects from previous supporting PE firms, the respective investment in the target company had to be the first investment of a PE firm. This also implies that all secondary buyouts were excluded from the search. Initially, 914 buyout related transactions were identified, from which 675 originated from the Netherlands, 206 from Belgium and 33 from Luxembourg. For each deal, several variables were selected: the target BvD-ID number, the target name, the investor name, the deal completion date and the final stake of the investor in the target after the buyout. A BvD-ID number is an unique code associated with a single company that allows convenient data collection and eliminates the issue of name changes in companies.

In the second phase of data collection, accounting information for the sample of buyout companies was collected from Orbis, another commercial database managed by BVD, containing accounting information of 79 million public and private companies worldwide. By using the target BvD-ID number and the deal completion date from Zephyr, I was able to collect the accounting information from years 0 to +3 after the buyout, where the year of the first investment of the PE firm is defined as year 0. For each company, the following variables were collected: sales, EBIT, EBITDA, total assets, shareholders' funds (e.g. equity), short-term liabilities, long-term liabilities, target age (at time of the buyout), target industry⁵. If data was missing in the years 0 to +3 after the buyout, an additional search for data was conducted in Amadeus, a database of comparable financial and business information on Europe's largest 500,000 public and private companies, again managed by BVD. If the missing data wasn't available in Amadeus, one last attempt to enrich the list of data was to manually look for the company's financial statements in Company.info or KBO Public Search, which are databases containing annual reports of the Netherlands and Belgium respectively. After whittling down the initial sample using these criteria, I was left with a final sample of 101 buyouts of which all

⁵ According to the 4-digit US Standard Industry Classification (SIC).

variables included complete accounting information, except for EBITDA. Since this performance indicator only covered 48 observations in the final sample, I decided to drop EBITDA/Sales and EBITDA/Assets and hence Hypotheses 7-10.

The third phase was devoted to collect all information on the PE firms investing in the target company. The data was collected from Thomson Banker One (TOB), a database that offers more complete information on M&A and PE data. Following the methodology described in Cressy et al. (2007), I identified all the PE firms over the period 2003-2014 in the Benelux and collected data on the following points of interest: firm name, firm type, firm size (measured as capital under management), firm age (at time of the buyout), the total number of investments (number of companies), and a breakdown of portfolio companies by name, investment date, industry and stage of investment. After checking if the PE data and buyout dates from TOB were in line with the collected data from Zephyr, I identified for each deal the lead investor as either (a) the PE firm that at the buyout completion date was explicitly mentioned or (b) the PE firm that held the majority stake at that date⁶.

In the fourth and final phase of data collection, for every buyout in the sample a peer group was identified and selected from Orbis. The selection process included the following four criteria. First, the peer companies had to be private (unlisted) companies, since the buyout companies are unlisted. Second, the companies had to operate in the same industry, based on the buyout company's SIC code. Third, companies had to be similar in terms of total sales and total assets in the year of the buyout. Following Alperovych et al. (2013), both criteria had to be within the 70-130% range of total sales and total assets of the corresponding buyout. Lastly, it was preferred that the peer companies were operating in the same country. If I couldn't identify 10 similar companies based on these criteria, the scope would be broadened from national level to regional level, which included all European private companies in the same industry with similar sales levels. Following this step-by-step approach, a peer group of 10 companies was manually constructed for every buyout company in the sample. Finally, for each of the peer companies in the peer group, accounting information was collected from Orbis for the same performance indicators in the same time period. Thereafter, the median would be calculated for every performance indicator of the peer group as a whole, including the buyout company. In the end, the medians would be used as a comparison for performance between the buyout companies and the respective industry.

⁶ This way I could see which deals were syndicated and which investor had the highest possible influence on post-buyout performance. According to Chapman & Klein (2009), PE firms need a majority stake to have a strong influence in the decisions making process, thereby having the ability to bring out a new, more focused, strategy.

3.1.4 Variables

A listing of the dependent, independent and control variables used in this empirical research along with their definitions can be found in Table 1. The following section provides an explanation for the choice of these variables.

Table 1

Definitions of variables used in the empirical analysis.

Dependent variables	Definition
Turnover growth	Geometric mean growth of sales in the 3 years after the buyout.
EBIT/ Sales	Mean operating profitability in the 3-year window after the buyout computed as (EBIT/Sales)*100.
EBIT/ Assets	Mean operating profitability in the 3-year window after the buyout computed as (EBIT/Assets)*100.
Independent variables	
Private equity	A dummy measuring the organizational form of the company and taking the value of 1 for a buyout company and 0 for the control company.
PE Industry-specialised	A dummy variable for industry specialisation taking the value 1 when the company was acquired by a lead PE firm specialised in its primary industry and 0 elsewhere.
PE Stage-specialised	A dummy representing stage specialisation of PE firms and taking the value 1 when the target was acquired by a lead PE firm specialised in the buyout stage and 0 elsewhere.
Control variables	
Turnover_0	A measure of initial target size given by its turnover at year 0 (the year of the buyout).
Profitability_0	The EBIT-margin of the target company, defined as EBIT/total assets at year 0.
Gearing_0	The target company's debt over equity at year 0, computed as (Total Liabilities/ Equity)*100.
Independent PE	A dummy representing independent PE firms and taking the value 1 for buyouts backed by independent (i.e. non-affiliated) PE firms and 0 elsewhere.
PE Size	A determinant of the PE firm size, measured as total capital under management in Euro's.
Syndicated	A dummy for syndicated deals, taking the value 1 for buyouts involving more than 1 investors in the deal and 0 elsewhere.
PE Experience	Total number of investments (number of companies) of the lead PE firm up until the buyout.
PE Age	The age of the PE firm at the time of the buyout.
Target Age	The age of the target company at the time of the buyout.
Bubble	A dummy taking the value 1 for buyouts occurring in years 2005,2006 or 2007 and 0 elsewhere.

(i) Dependent variables

The performance indicators, as outlined earlier in this chapter, represent the dependent variables. Following the methodology of Cressy et al. (2007), *turnover growth* will be measured as the geometric mean growth of sales in the 3 years after the buyout. In addition, *operational profitability* will be measured as the mean operating profitability in the 3 years after the buyout, scaled by sales or total assets. As mentioned in section 3.1.3, the metrics for EBITDA-margins had to be dropped, since only 48 observations were available.

(ii) Independent theory variables

As regards for theory variables, I created three dummy variables. *Private Equity* captures the effect of the organizational form (PE-backed versus traditional) and takes the value 1 for PE-backed companies and 0 elsewhere. In this way, company performance can be compared and analyzed between PE-backed companies and industry peer groups.

The dummies *PE industry specialization* and *PE stage specialization* capture the effect of portfolio specialization relative to the PE firm's competitors in the subsample of PE-backed companies. The degree of PE specialization by industry or stage can be computed using the index of competitive advantage (ICA), as described in Cressy et al. (2007) and Meuleman et al. (2009). Specifically, the index is computed as:

$$ICA_{ij} = (C_{ij} / C_{.j}) / (C_i / C_{..})$$

where a dot indicates summation over the relevant subscript and

C_{ij} is the total number of portfolio companies of PE firm i in industry/stage j ,

$C_{.j}$ is the total number of companies invested in industry/stage j by all PE firms,

C_i is the total number of portfolio companies of PE firm i ,

$C_{..}$ is the total number of companies invested by all PE firms (i.e. across all industries/stages).

The PE firm i 's stake of all investments in industry/stage j is represented in the numerator ($C_{ij} / C_{.j}$) and the PE firm i 's stake in all investments (i.e. across all industries/stages) is represented in the denominator. Therefore if the value of ICA_{ij} is greater (less) than 1, one can assume that PE firm i is relatively specialized (unspecialized) in industry/stage j . With the data from TOB as described in section 3.1.3, I could compute the ICA index for each PE firm in Excel. Finally, the dummy variables could be assessed to the companies in both samples. *PE industry-specialized* takes the value 1 if the company was acquired by a lead PE firm with an ICA greater than 1 in its primary industry (i.e. specialized in that industry), and 0 elsewhere. By contrast, the matched peer group companies in the control group always take the value 0. For the dummy *PE stage-specialized*, an exactly analogous step-by-step approach was used⁷.

⁷ Thomson Banker One provides industry classifications across different scopes. For computing the ICA index, "industry subgroup 1" was used because this benchmark uses a comprehensive hierarchy that can be summarized to 18 high-level classifications of industries, thereby representing a clear and simple overview of industries. As regards to stage specialization, Thomson Banker One classifies all venture capital and private equity deals in 6 categories: seed, early-stage, expansion, later-stage, buyout/acquisition, and other. This study is interested in the performance of "buyout/acquisition" deals versus the rest.

(iii) Independent control variables

As regards for the control variables, the available literature investigating the post-buyout performance of buyouts describe many more factors that can influence a PE firm's investment decision and buyout performance. In order to control for such factors that are not inside the formerly mentioned theoretical model, the following control variables are analyzed.

Turnover₀ – Nikoskelainen & Wright (2007) find evidence that the probability of a positive post-buyout performance is highly related to the size of the target. Kaplan (1991) and Alperovych et al. (2013) find similar evidence (i.e. larger buyouts perform better and provide higher investor returns). These findings suggest that the size of the target may be influential in determining the post-buyout performance. Therefore, target size is operationalized by sales in year 0.

Profitability₀ – Besides initial sales levels, Guo et al. (2011), Bergström et al. (2007), Cressy et al. (2007) and Meuleman et al. (2009) control for the effect of previous profitability levels as initial profitability levels could have a positive impact on post buyout performance. Therefore, I include the profitability of the target in the year of the buyout as a control variable, measured as EBIT/Assets.

Gearing₀ – Gearing (leverage) is the target firm's debt-equity ratio in the year of the buyout. As mentioned in the literature review, higher debt reduce agency costs by disciplining management (Guo et al., 2011; Cumming et al., 2007). This control variable is included because the disciplinary effect of debt may remain, even after netting out financial engineering aspects of this ratio in the choice for dependent variables (Cressy et al., 2007; Meuleman et al. 2009; Alperovych et al., 2013).

Independent PE – In the section that describes the collection of the sample data, firm type was mentioned. This variable indicates whether the PE firm is affiliated or not. According to articles of Manigart et al. (2002), Cressy et al. (2007) and Meuleman et al. (2009), PE affiliates of financial institutions or PE firms run by governments or other public organizations may have less pressure to maximize returns compared to independent PE firms. For example, financial institutions (e.g. banks) do not have the pressure to raise funding from third parties. In addition, governments may prefer maximizing employment growth of target companies at the cost of the company's wealth. In order to control for such differences, the variable *Independent PE* takes the value 1 if the PE firm is independent and 0 in all other cases.

PE size – According to Kaplan & Schoar (2005), there is a relationship between PE size and the rate of return. The rationale for the size of the PE firm to have an influence on returns

is that larger firms can benefit from economies of scale investments and larger funds available, which are associated with higher returns. Following the study of Cressy et al. (2007), this variable represents the total capital under management of the PE firm.

Syndicated – Syndicated deals may be diluting the results as investment partners to the lead PE firm may contribute to the selection of targets and will contribute to the financing of the deal (Cumming et al., 2007; Meuleman et al., 2009; Alperovych et al., 2013). In addition, syndicated deals increase the probability that explicit knowledge built up by specialized PE firms will be transferred to generalized PE firms, thereby reducing the information asymmetry between the two (Jungwirth & Moog, 2004). In this way, the advantage-to-specialization hypotheses may be tested incorrectly. Therefore, this variable will be controlled for and takes the value of 1 if the buyout is completed in the form of a syndicate and 0 elsewhere.

PE experience – The experience of the lead PE firm has shown to have a significant positive influence on post-buyout performance (Gompers et al., 2008; and Meuleman et al. 2009; Alperovych et al., 2013). Therefore, PE experience will be controlled for and is measured as the total amount of deals executed by the PE firm at the time the investment is made (Cressy et al. 2007).

PE age – Mature PE firms could already have a strong reputation and proven their ability to perform above the market. In addition, mature PE firms may have built up more experience. In other words, these firms may have easier access to funds available and can benefit of the economies of scale investments. As mentioned earlier in this section, this is associated with higher returns. Therefore, the age of the PE firm will be controlled for and is measured as the difference between the year of the buyout and the year of the PE firm's foundation (Meuleman et al., 2009).

Target age – According to Brown et al. (1992), the age of the target at the year of the buyout is directly related to the stability and ability to survive. The rationale is that mature companies tend to grow slower than younger companies, but are less likely to fail. Target age in years is measured as the difference of the year of the buyout and the year of the target's foundation (Cressy et al. 2007).

Bubble – Finally, the last dummy variable will account for changing market circumstances and economic turbulence, which are of macro-economic influence. Ljungqvist & Richardson (2003), Lossen (2006) and Cressy et al. (2007) show that reputable investors are especially good at timing their investments, indicating that market timing matters for PE fund returns. The authors argue that in boom years a relatively high amount of equity funds for buyout purposes is available and this in turn may influence the company's growth possibilities

and profitability over the post-buyout period. According to Hoskisson, Shi, Yi & Jin (2013) the second wave of buyouts started in the end of the 1990s and reached its peak in 2007, but was interrupted by the 2008 global financial crisis. As one can see in Table 2, the amount of deals in this sample sharply increased in the years 2005 to 2007. Following the study of Cressy et al. (2007) to control for bubbles, this variable takes the value of 1 for buyouts completed in the years 2005 to 2007 and 0 elsewhere.

Table 2
Deal frequencies by year

Year	PE-backed buyouts	
	<i>Obs</i>	<i>Percent</i>
2003	4	4,0
2004	5	5,0
2005	13	12,9
2006	20	19,8
2007	21	20,8
2008	10	9,9
2009	6	5,9
2010	12	11,9
2011	10	9,9
Total	101	100%

3.2 Analyses and results

This section starts in Table 3 which presents a detailed overview of descriptive statistics for the sample categorized into buyout data and industry peer group data. This is followed in Table 4 which separates the descriptive statistics for the dependent variables into buyouts backed by specialized and generalized PE firms and by industry or stage. Tests for normality of the data are presented in Table 5 and Table 6. This is followed by Table 7 which contains bivariate comparisons of the performance of the buyout companies and the industry peer groups. Subsequently, Table 8 and Table 9 present an Analysis of Variance (ANOVA) and a Welch ANOVA respectively to explore possible differences in the performance of buyouts backed by specialists, buyouts backed by generalists and non-buyouts (industry peer groups). In Table 10, a sample correlation test is performed principally to assess potential co linearity amongst the independent variables. Finally, in the most important part of the study, Table 11-13 present the outcomes of the regressions that describe the effects of PE involvement and PE specialization by industry or stage on post-buyout performance whilst controlling for alternative influences.

3.2.1 Descriptive statistics

In Table 3 one can find a detailed summary of the descriptive statistics for the PE-backed buyouts and matched peer groups respectively. The median turnover growth in the three years after the buyout is registered at 5.30% for buyouts and 2.75% for the industry peer groups. The average operating EBIT/Sales points to a median of 6.99% and 3.72% for the two groups respectively. In addition, average operating EBIT/Assets reports a median of 10.61% for buyouts and 5.39% for control groups. With regards to turnover in year 0, one can identify a similar size for buyouts (34.3 million Euro) and matched peer groups (34.6 million Euro). This

is not surprisingly of course, since buyouts and industry peer groups were matched on size. Average operating profitability in the year of the buyout, as measured by EBIT/Assets, accounted 10.24% for buyout companies and 4.00% for their peers. For the debt-equity ratio (gearing) in the same year, one can identify a much higher ratio of 3.11 for buyouts versus 1.79 for the matched sample. Examining the group of 101 buyouts, 85 of the deals in the sample (84.2%) were backed by an independent PE firm (i.e. a PE firm that is not affiliated to financial institutions, governments or other public organizations) and 16 (15.8%) by a dependent PE firm. Only 4.95% of the buyouts in the sample were syndicated deals. The variable PE experience shows that a typical PE firm had about 57 executed investments at the time of the buyout. In addition, the median age of the PE firms was 11 years at time of the buyout, indicating that PE firms were rather experienced at investing.

Table 3
Descriptive statistics for buyouts and control companies.

Variable	PE-backed buyouts					Control companies (industry performance)			
	<i>Obs</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Turnover growth	101	3.38%	113.13%	-87.74%	1089.31%	1.64%	5.65%	-15.32%	13.20%
EBIT/Sales*100	101	6.99%	47.31%	-348.37%	96.62%	3.72%	7.78%	-48.47%	41.91%
EBIT/Assets*100	101	10.61%	17.39%	-80.03%	97.16%	5.39%	4.24%	-15.63%	20.47%
Private Equity	101	1.00	0.00	1.00	1.00	NA	NA	NA	NA
PE Industry Specialized	101	1.00	0.44	0.00	1.00	NA	NA	NA	NA
PE Stage Specialized	101	1.00	0.43	0.00	1.00	NA	NA	NA	NA
Turnover_0	101	34.31	336.86	0.05	3181.77	34.61	293.12	0.20	2730.92
Profitability_0	101	10.24%	21.45%	-69.74%	110.26%	4.00%	10.89%	-91.00%	26.00%
Gearing_0	101	3.11	14.14	-15.65	117.14	1.79	1.89	-4.64	10.31
Independent PE	101	1.00	0.37	0.00	1.00	NA	NA	NA	NA
PE Size	101	449.97	2799.31	0.20	15725.98	NA	NA	NA	NA
Syndicated	101	0.00	0.22	0.00	1.00	NA	NA	NA	NA
PE Experience	101	57.00	159.90	1.00	1449.00	NA	NA	NA	NA
PE Age	101	12.00	14.39	0.00	109.00	NA	NA	NA	NA
Target age	101	19.00	25.45	0.00	127.00	NA	NA	NA	NA
Bubble	101	1.00	0.50	0.00	1.00	1.00	0.50	0.00	1.00

Note: This table reports descriptive statistics for 101 PE-backed buyouts and control peer groups in the Benelux over the period 2003-2011. The variables *Turnover growth*, *EBIT/Sales* and *EBIT/Assets* represent the dependent variables that measure post-buyout performance. The variables *Private Equity*, *PE Industry Specialized*, *PE Stage Specialized* and *Independent PE* are dummy variables taking the value 1 if the company is acquired respectively by a PE Firm, by an industry-specialized PE firm, by a buyout-specialized PE firm or by an independent PE firm and 0 elsewhere. *Turnover_0*, *Profitability_0*, *Gearing_0* and *Target Age* measure respectively turnover, operating EBIT/Assets, debt-equity ratio and age of the target company at the year of the buyout. *PE Size* encompasses the PE firm's total capital under management. *Syndicated* is a dummy variable taking the value 1 for syndicated buyout deals *PE Experience* encompasses the experience of the acquiring PE firm measured as the total number of investments of the lead PE firm up until the buyout. *PE Age* is the age of the PE firm at the time of the buyout. *Bubble* is a dummy taking the value 1 for buyouts occurring in the years 2005-2007 and 0 elsewhere.

Table 4 presents a more detailed summary of the descriptive statistics for the dependent variables and separates the 101 deals of the sample into buyouts backed by specialists and generalists. As regards to PE specialization by industry, Panel A reports that 74 buyouts (73.3%) were backed by a PE firm specialized in the same industry and 26 (26.7%) by an PE firm not so-specialized. Turnover points to a median growth rate of 2.75% and 5.30% in the two groups respectively. Average operating profitability in year 0 to +3 after the buyout, as measured by EBIT/Sales, registered at 6.64% for specialists and 9.67% for generalists. By contrast, in the case of operating profitability scaled by assets, the table reports slightly higher returns to specialists (10.84%) compared to generalists (10.39%).

Table 4

Descriptive statistics on dependent variables for buyouts backed by PE specialists or generalists in relation to industry and stage.

<i>Panel A: Specialization by INDUSTRY</i>		(1) Specialists					(2) Generalists				
	Obs	Median	Std. Dev.	Min	Max	Obs	Median	Std. Dev.	Min	Max	
Turnover growth	74	2.75%	15.32%	-87.74%	1089.31%	27	5.30%	2.93%	-43.80%	43.50%	
EBIT/Sales*100	74	6.64%	6.33%	-348.37%	96.62%	27	9.67%	2.75%	-14.59%	69.20%	
EBIT/Assets *100	74	10.84%	2.22%	-80.03%	97.16%	27	10.39%	2.20%	-5.37%	45.61%	

<i>Panel A: Specialization by STAGE</i>		(1) Specialists					(2) Generalists				
	Obs	Median	Std. Dev.	Min	Max	Obs	Median	Std. Dev.	Min	Max	
Turnover growth	76	2.35%	14.57%	-87.74%	1089.31%	25	5.89%	10.72%	-11.55%	269.40%	
EBIT/Sales*100	76	6.80%	6.22%	-348.37%	96.62%	25	8.71%	2.34%	-43.18%	18.65%	
EBIT/Assets *100	76	10.50%	1.69%	-18.87%	97.16%	25	11.25%	4.81%	-80.03%	59.75%	

Note: The table presents descriptive statistics for the dependent variables that describe post-buyout performance. Panel A consists of 74 buyouts backed by industry-specialized PE firms, 27 buyouts by not so-specialized PE firms and 101 non-buyouts for all three variables. Panel B focusses on stage specialization and encompasses 76 buyouts backed by stage-specialized PE firms, 25 buyouts by not so-specialized PE firms and 101 non-buyouts.

Finally, as regards to PE specialization by stage (Table 4, Panel B), I register that 76 deals (75.2%) were backed by a PE firm specialized in the buyout/acquisition stage and 25 (24.8%) by a PE firm not so-specialized. Specialists still note a lower turnover growth rate compared to their competitors (2.35% vs 5.89% for the two groups respectively). The same holds for the average operating profitability scaled by sales, which reports median returns of 6.80% for specialists and 9.67% for generalists. In case of average operating profitability scaled by assets, statistics show that specialists underperform again with a median return of 10.50% versus 11.25% to generalists.

3.2.2 Testing for normality

Prior literature shows that many parametric statistical tests used in quantitative research are sensitive to the normality of sample data. When the study variables are non-normally distributed the results of the tests can be misleading or even completely erroneous. In this study, testing of normality was done by conducting the Shapiro-Wilk test for all continues variables in the sample. If the Shapiro-Wilk test showed a p-value greater than 0.05, this would indicate a normally distributed variable. For every variable that didn't meet this assumption, a data transformation was run in order to transform the variable into a normally distributed. As one can see in Table 5, none of the continues variables are normally distributed. The Shapiro-Wilk test shows a p-value of less than 0.05 for every variable, indicating that the variables significantly deviate from a normal distribution. Another way to assess normality is using the skewness and kurtosis statistics. A skewness- or kurtosis value of at least twice its standard error indicates a departure from the normal distribution (Field, 2009).

Table 5
Testing for normality.

Testing for normality: <i>Continues variable</i>	N <i>Statistic</i>	(1) Descriptive statistics				(2) Shapiro-Wilk	
		Skewness		Kurtosis		<i>Statistic</i>	<i>Sig.</i>
		<i>Statistic</i>	<i>Std. Error</i>	<i>Statistic</i>	<i>Std. Error</i>		
Turnover growth	202	12.332	0.171	164.272	0.341	0.163*	0,000
EBIT/Sales*100	202	-8.053	0.171	78.326	0.341	0.293*	0,000
EBIt/Assets*100	202	0.740	0.171	22.707	0.341	0.685*	0,000
Turnover_0	101	8.025	0.240	71.285	0.476	0.262*	0,000
Profitability_0	101	0.835	0.240	6.737	0.476	0.835*	0,000
Gearing_0	101	5.676	0.240	39.847	0.476	0.435*	0,000
PE Size	101	3.942	0.240	16.500	0.476	0.471*	0,000
PE Experience	101	6.424	0.240	52.489	0.476	0.435*	0,000
PE Age	101	3.227	0.240	17.041	0.476	0.733*	0,000
Target age	101	2.078	0.240	4.880	0.476	0.783*	0,000

Note: The descriptive statistics in the table present an overview of the skewness and kurtosis values of the continues variables in the sample. A skewness- or kurtosis value of more than twice its standard error indicates a departure from the normal distribution. The Shapiro-Wilk test shows whether a variable is normally distributed. If the sig. value of the Shapiro-Wilk Test is greater than 0.05, the data is normal. The asterisks denote the level of significance: *<0.01, **<0.05, ***<0.1.

Templeton (2011) argues that the use of transformation methods may improve causal inferences, including statistical power, hypothesis tests, effect sizes and generalizability. In particular financial data often includes outliers that causes heteroscedasticity in regression tests and produces bias in statistical results. Templeton (2011) states that such bias should be mitigated as much as possible in statistical analyses and is minimized as variable distributions approach normality. Following research done by Templeton (2011), who demonstrates a simple yet powerful approach to transform non-normally distributed continues variables toward statistical normality, a “Two Step” transformation was run on *Turnover Growth*, *EBIT/Sales*, *EBIT/Assets*, *Turnover_0*, *Profitability_0*, *Gearing_0*, *PE Size*, *PE Experience*, *PE Age* and *Target Age*. Table 6 presents the results of the transformed variables.

Table 6
Testing normal distributions for transformed variables.

Testing for normality:		(1) Descriptive statistics				(2) Shapiro-Wilk	
<i>Continues</i>	N	Skewness		Kurtosis			
<i>Transformed variable</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Std. Error</i>	<i>Statistic</i>	<i>Std. Error</i>	<i>Statistic</i>	<i>Sig.</i>
Turnover growth	202	0.194	0.171	0.338	0.341	0.996	0.929
EBIT/Sales*100	202	0.194	0.171	0.338	0.341	0.996	0.929
EBIt/Assets*100	202	0.194	0.171	0.338	0.341	0.996	0.928
Turnover_0	101	0.372	0.240	0.778	0.476	0.990	0.654
Profitability_0	101	0.372	0.240	0.778	0.476	0.990	0.654
Gearing_0	101	0.372	0.240	0.778	0.476	0.990	0.654
PE Size	101	0.358	0.240	0.786	0.476	0.986	0.375
PE Experience	101	0.373	0.240	0.767	0.476	0.981	0.159
PE Age	101	0.383	0.240	0.780	0.476	0.986	0.381
Target age	101	0.385	0.240	0.770	0.476	0.987	0.443

Note: This table presents the skewness and kurtosis values and the Shapiro-Wilk test results of the transformed variables. It should be noted that +1 was added to all variables that comprises percentages. Again, a skewness- or kurtosis value of more than twice its standard error indicates a departure from the normal distribution. If the sig. value of the Shapiro-Wilk Test is greater than 0.05, the data is normal. The asterisks denote the level of significance: *<0.01, **<0.05, ***<0.1.

It can be observed that the Shapiro-Wilk test now reports a p-value greater than 0.05 for every transformed variable. In addition, the values of skewness and kurtosis are closer to 0 than before, indicating that the variables follow a more normal distribution. The results indicate that the variables have been successfully transformed toward statistical normality and can now be used for further statistical analysis.

3.2.3 Bivariate comparisons

In this section a matched paired methodology is adopted from Cressy et al. (2007) to test whether significant differences exist between PE and non-organizational forms. First, to examine whether a significant difference exist between buyouts and non-buyouts in relation to their post-buyout performance, an independent samples t-test is conducted. An important assumption of the test is that the variances of the two groups are equal. This is examined using Levene's test of homogeneity of variances. The output of the analysis can be found in Table 7.

Table 7

Differences in post-buyout performance between PE-backed companies and non-buyouts, using an independent t-test.

<i>Specialization by INDUSTRY</i>	Group statistic means		Levene's test for equality of variances		T-test for equality of means	
	<i>PE-backed buyouts</i>	<i>Non-buyouts</i>	<i>Levene's statistic</i>	<i>P-value</i>	<i>T-test</i>	<i>P-value</i>
Turnover Growth	1.269	0.950	25.509*	0.000	2.836*	0.005
EBIT/Sales*100	1.124	0.973	17.234*	0.000	3.213*	0.002
EBIT/Assets*100	1.118	1.058	41.544*	0.000	3.333*	0.001

Note: The table compares the mean values of the transformed dependent variables between buyouts and non-buyouts. The sample size is 101 for both categories and for all variables. The means of the three performance indicators are shown on the left. The results of Levene's test are shown in the middle. Significance levels, as determined by the independent samples t-test are shown on the right (equal variances not assumed). The asterisks denote the level of significance: * <0.01 , ** <0.05 , *** <0.1 .

The table shows that Levene's test is significant for all dependent variables. This indicates that heterogeneity in variances between groups exists. Therefore, I only reported the significance levels of the t-test that are based on unequal variances. The results show that there exists statistically significant differences in all three performance indicators between buyouts and non-buyouts. The difference in the mean value of post-buyout turnover growth between buyouts (1.269) and non-buyouts (0.950) is significant at the 1% level ($p=0.005$). Similarly, I find statistically significant differences in the mean values of both EBIT/Sales (1.124 for buyouts and 0.973 for non-buyouts) and EBIT/Assets (1.118 for buyouts and 1.058 for non-buyouts) between groups at the 1% level each ($p=0.002$ and $p=0.001$ respectively). These results indicate that companies backed by PE firms significantly do better than their matched peer groups in terms of post-buyout performance. This is in line with research done by Cressy et al. (2007), who find evidence that buyouts backed by PE firms experience higher turnover

growth and EBIT/Assets compared to non-buyouts, thereby lending support to the superiority of the PE organizational form.

More relevant for this study is to note if there exists a significant difference in performance between PE-backed buyouts and non-buyouts, and within the former group between PE specialists and PE generalists. To explore for possible differences between the three groups, an ANOVA-analysis is conducted. This test can be used to make direct comparisons between the means of two or more independent (unrelated) groups. However, before I choose to analyze the data using a one-way ANOVA-analysis the associated assumptions need to be checked. These include that the dependent variables should be measured at the interval or ratio level, be normally distributed and should not consist of significant outliers. In addition, the independent variables should consist of two or more categorical groups and there should be homogeneity of variances across groups once more. All of these assumptions are being met accept for the last one. The results of the analysis can be found in Table 8.

Table 8

Differences in post-buyout performance between three groups, using one-way ANOVA.

Variable	Group statistic means			Levene's test for equality of variances		One-way ANOVA	
	<i>Buyouts backed by PE</i>	<i>Buyouts backed by PE</i>	<i>Non-buyouts</i>	<i>Levene's statistic</i>	<i>P-value</i>	<i>F-test</i>	<i>P-value</i>
Turnover Growth	1.243	1.341	0.950	13.876*	0.000	4.155**	0.017
EBIT/Sales*100	1.093	1.209	0.973	9.416*	0.000	6.405*	0.002
EBIT/Assets*100	1.110	1.140	1.058	21.521*	0.000	6.109*	0.003

Variable	Group statistic means			Levene's test for equality of variances		One-way ANOVA	
	<i>Buyouts backed by PE</i>	<i>Buyouts backed by PE</i>	<i>Non-buyouts</i>	<i>Levene's statistic</i>	<i>P-value</i>	<i>F-test</i>	<i>P-value</i>
Turnover Growth	1.222	1.411	0.950	12.928*	0.000	4.548**	0.012
EBIT/Sales*100	1.128	1.111	0.973	8.953*	0.000	5.161*	0.007
EBIT/Assets*100	1.112	1.137	1.058	21.188*	0.000	5.930*	0.003

Note: This table presents a comparison of the mean values of the transformed dependent variables between buyouts and non-buyouts, and within the former group between buyouts backed by specialized PE firms and non-specialized PE firm by use of an one-way ANOVA-analysis. Panel A focuses on industry specialization and encompasses 74 buyouts backed by industry-specialized PE firms, 27 buyouts by not so-specialized PE firms and 101 non-buyouts for all three variables. Panel B focusses on stage specialization and encompasses 76 buyouts backed by stage-specialized PE firms, 25 buyouts by not so-specialized PE firms and 101 non-buyouts. This is the case for all three variables once more. The left side of the table presents the mean values of the performance indicators across groups. The middle presents Levene's test statistics. The right side of the table presents the results of the ANOVA-analysis. Levels of significance reported: *<0.01, **<0.05, ***<0.1.

As one can see the assumption of homogeneity of variances is violated for all observations in both panels. Whilst significant differences exist in all performance indicators across groups in terms of industry and stage, the results need to be interpreted with caution as Levene's test results are all significant at the 1% level. When there is heterogeneity in variances between groups, research shows that the critical values proposed by the Welch ANOVA are a better approximation. Brown & Forsythe (1974) state that both Welch's statistic and the modified F are robust under the inequality of variances. Therefore, I also conduct a Welch ANOVA test of which the results are presented in Table 9.

Table 9

Differences in post-buyout performance between three groups, using Welch ANOVA.

<i>Panel A: Specialization by INDUSTRY</i>	Group statistic means			Welch ANOVA	
	<i>Buyouts backed by PE specialists</i>	<i>Buyouts backed by PE generalists</i>	<i>Non-buyouts</i>	<i>Welch's statistic</i>	<i>P-value</i>
Turnover Growth	1.243	1.341	0.950	4.337*	0.017
EBIT/Sales*100	1.093	1.209	0.973	6.979*	0.002
EBIT/Assets*100	1.110	1.140	1.058	6.330*	0.003

<i>Panel B: Specialization by STAGE</i>	Group statistic means			Welch ANOVA	
	<i>Buyouts backed by PE specialists</i>	<i>Buyouts backed by PE generalists</i>	<i>Non-buyouts</i>	<i>F-test</i>	<i>P-value</i>
Turnover Growth	1.222	1.411	0.950	4.873*	0.011
EBIT/Sales*100	1.128	1.111	0.973	5.112*	0.009
EBIT/Assets*100	1.112	1.137	1.058	5.592*	0.006

Note: As heterogeneity in variances between groups is assumed, this table compares the mean values of *Turnover Growth*, *EBIT/Sales* and *EBIT/Assets* between groups using the Welch-ANOVA analysis. Levels of significance reported: *<0.01, **<0.05, ***<0.1.

First, Panel A compares buyouts backed by PE industry specialists, buyouts backed by PE generalists and non-buyouts. In contrast to Hypothesis 1, greater PE industry specialization is not associated with higher post-buyout turnover growth. Specialists report a mean turnover growth of 1.243, which is lower than the growth of generalists (1.341). Further, buyouts backed by PE firms outperform non-buyouts (0.950), all differences being significant at the 5% level ($p=0.017$). This is in line with Meuleman et al. (2009), who also find a higher turnover growth for buyouts compared to non-buyouts. Similarly, PE industry specialists report lower returns

(1.093) compared to PE generalists (1.209) in terms of post-buyout EBIT/Sales, which are in turn higher than non-buyouts (0.973). All differences are significant at the 1% level ($p=0.002$), thereby contradicting hypothesis 2. As regards to the third performance indicator (EBIT/Assets), I find evidence that PE industry specialists underperform their competitors once more, with mean values of 1.11 and 1.14 for the two groups respectively and all differences being significant at the 1% level ($p=0.003$). All these findings are not in line with Cressy et al. (2007), who find evidence that PE industry specialists outperform their competitors significantly in terms of post-buyout EBIT/Assets. In addition, the authors find that no significant difference exists between PE industry specialists, PE generalists and non-buyouts in relation to post-buyout turnover growth, whilst this research reports a significant higher growth for PE generalists.

Second, Table 9 Panel B shows the Welch ANOVA results for PE specialization by stage. The statistics show that buyouts backed by stage specialized PE firms yield lower turnover growth in the three years after the buyout (1.222) compared to buyouts by not so-specialized PE firms (1.411), thereby contradicting Hypothesis 4. However, both groups report a higher growth compared to non-buyouts (0.950), all differences being significant at the 5% level ($p=0.011$). The same holds for Hypothesis 5. PE buyout specialists report lower post-buyout EBIT/Sales compared to PE generalists, all differences being significant at the 1% level ($p=0.009$). Finally, statistics show that the returns in terms of post-buyout EBIT/Assets of companies acquired by PE generalists (1.137) are somewhat higher than those of companies acquired by PE specialists (1.112), which are in turn higher than non-buyouts (1.058). All differences between the three groups are significant at the 1% level ($p=0.006$), thereby providing no direct support for Hypothesis 6. When comparing these statistics with the findings of Cressy et al. (2007) I find some interesting results. Similar as in the research of Cressy et al. (2007) I find evidence that greater stage diversification is associated with higher returns in terms of post-buyout EBIT/Assets. However, in contrast to Cressy et al. (2007) I find evidence that greater stage diversification is also associated with higher post-buyout turnover growth. Nevertheless, these findings only explain whether or not significant differences exists between the three groups. To explore what factors causes the differences, multiple regressions will need to be conducted.

3.2.4 Sample correlation matrix

Table 10 presents the correlation matrix of the sample principally to assess potential co-linearity

Table 10

Sample correlation matrix for PE-backed firms.

	PE Industry Specialized	PE Stage Specialized	Turnover_0	Profitability_0	Gearing_0	Independent PE	PE Size	Syndicated	PE Experience	PE Age	Target age	Bubble
PE Industry Specialized	1											
PE Stage Specialized	0.703	1										
Turnover_0	-0.120	0.037	1									
Profitability_0	-0.008	-0.141	-0.037	1								
Gearing_0	-0.039	0.029	0.013	-0.162	1							
Independent PE	0.228	0.254	0.091	-0.090	0.059	1						
PE Size	-0.164	0.040	0.253	-0.170	0.028	0.250	1					
Syndicated	-0.068	0.025	-0.102	-0.080	-0.004	0.099	-0.012	1				
PE Experience	-0.231	-0.177	0.223	-0.011	0.028	-0.074	0.564	-0.021	1			
PE Age	-0.014	-0.147	0.171	0.038	-0.009	0.001	0.208	-0.101	0.597	1		
Target age	-0.127	-0.020	0.221	-0.011	-0.120	0.027	0.089	-0.150	-0.060	0.070	1	
Bubble	0.020	-0.259	0.043	-0.101	0.068	-0.133	-0.035	-0.153	-0.043	-0.094	-0.029	1

Note: This table presents simple correlations between the variables in the subsample of PE-backed firms. In this table the highly correlated variables are indicated in bold. *PE Industry Specialized*, *PE Stage Specialized* and *Independent PE* are dummy variables taking the value 1 if the company is acquired respectively by an industry-specialized PE firm, by a buyout-specialized PE firm or by an independent PE firm and 0 elsewhere. *Turnover_0*, *Profitability_0*, *Gearing_0* and *Target Age* measure respectively turnover, operating EBIT/Assets, debt-equity ratio and age of the target company at the year of the buyout. *PE Size* encompasses the PE firm's total capital under management. *Syndicated* is a dummy variable taking the value 1 for syndicated buyout deals. *PE Experience* encompasses the experience of the acquiring PE firm measured as the total number of investments of the lead PE firm up until the buyout. *PE Age* is the age of the PE firm at the time of the buyout. *Bubble* is a dummy taking the value 1 for buyouts occurring in the years 2005-2007 and 0 elsewhere.

amongst independent variables. High correlations amongst explanatory variables are likely to create multicollinearity problems in the regression analysis. In the table one can observe that whilst most correlations are moderate there is one high correlation. Cressy et al. (2007) and Meuleman et al. (2009) eliminate all independent variables that have a correlation of 0.7 or higher. In this study a high correlation of 0.703 (or 70.3%) exists between *PE Industry Specialized* and *PE Stage Specialized*. However, these variables cannot simply be dropped since this study attempts to test the effect of these variables on post-buyout performance. Because of this I decided to conduct multiple regressions to separately test the effect of these variables.

3.2.5 Regressions

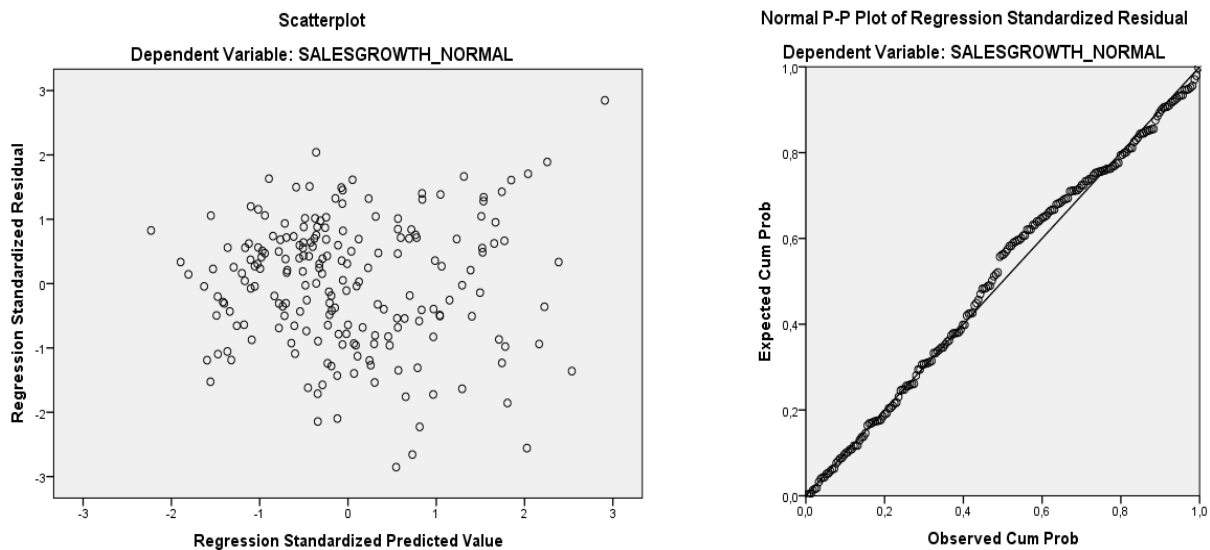
In this section the effects of organizational and strategic differences on the three different performance measures are being analyzed. The results of the independent samples t-test and the Welch ANOVA-analysis only tells us whether there exists a statistical difference in performance between the groups of interest. To test whether there exists a causal relationship between the PE form itself or PE specialization and superior performance of acquired companies, multiple regression are conducted. In this chapter three regressions are conducted on the full sample of companies (PE-backed vs. non-PE-backed) including a PE firm dummy and six regressions on the subsample of PE buyouts (specialized vs. non-specialized) including a PE industry- or stage-specialization dummy. The effects of the variables on post-buyout performance are estimated using ordinary least square (OLS) –regressions. Whilst running the regressions, it is imperative that the assumptions are being analyzed. These include linearity, independence of errors, homoscedasticity, collinearity and normality.

To check for linearity and homoscedasticity between the dependent variable and the predictor variables, I conduct the residual plot for every regression showing the standardized residuals vs. the predicted variables. According to Stevens (2009) this is a very useful strategy to detect violations in linearity and homoscedasticity. To detect independence of errors terms I include the Durban-Watson statistic in all regressions. If Durban-Watson's statistic is between 1.5-2.5, it can be assumed that error terms are independent. Finally, collinearity and normality was already corrected for. However, in order to be certain that the residuals of the regressions follow a normal distribution, I will check the skewness and kurtosis values of the residuals and the p-plots to spot deviations from normality. To illustrate an example Figure 2 presents the residual plot and p-plot of the Turnover Growth –regression with Private Equity as the main predictor variable. The residual plot in Figure 2 shows that there's no departure from linearity

or homoscedasticity as there's a random scatter about the horizontal line. Fan and butterfly shapes are common patterns of violations of linearity and homoscedasticity. However, these are not visible in the figure. As regards to normality of the residuals, this can be checked by observing the P-plot. If the plot follows a relatively straight line, one can assume no departure from normality. As one can see the P-plot follows a relatively straight line so it can be assumed that the residuals of the regression follow a normal distribution. Whilst analyzing these figures for all regressions in this chapter I experienced no violations of linearity, homoscedasticity or normality for all regressions.

Figure 2

Residual Plot and P-plot with Turnover Growth as the dependent variable and Private Equity as the main predictor variable.



Note: This figure illustrates an example of the ways in which assumptions of linearity, homoscedasticity and normality are being analyzed for the regressions that are conducted on the full sample of companies (PE-backed vs. non-PE-backed) and the regressions on the subsample of PE buyouts (specialized vs. non-specialized). In the figure one can observe the residual plot and the p-plot of the *Turnover Growth*–regression with *Private Equity* as the main predictor variable. The residual plot (on the left) shows a random scatter about the horizontal line so there's no departure from linearity or homoscedasticity. The p-plot (on the right) follows a relatively straight line so it can be assumed that the residuals of the regression are normally distributed.

(i) Regressions for PE and non-PE-backed companies (full sample)

Before moving to the hypotheses, this research attempts to find evidence that the PE form itself is associated with superior post-buyout performance of acquired companies. Table 11 shows the regressions regarding the PE and non-PE-companies' turnover growth, EBIT/Sales and EBIT/Assets in the three years after the buyout, whilst controlling for other possible factors that might influence performance. It should be noted that the Durban-Watson's statistic is between 1.5-2.5 for all regressions, so it can be assumed that error terms are independent.

Table 11

Summary regressions for PE and non-PE-companies' turnover growth, operating EBIT/Sales and operating EBIT/Assets in the three years after the buyout (impact of the PE form itself)

Variable	(1) Turnover Growth			(2) EBIT/Sales *100			(2) EBIT/Assets *100		
	Coefficient	Significance	(Standardized)	Coefficient	Significance	(Standardized)	Coefficient	Significance	(Standardized)
		Level	Coefficient		Level	Coefficient		Level	Coefficient
Private Equity	0.299**	0.012	0.184	0,104**	0.031	0.152	0.024	0.138	0.093
Turnover_0	-3.131E-07***	0.073	-0.123	-2.194E-07*	0.002	-0.204	-3.522E-08	0.143	-0.086
Profitability_0	-0.725**	0.041	-0.144	0.569*	0.000	0.269	0.426*	0.000	0.528
Gearing_0	0.013**	0.023	0.164	0.001	0.642	0.032	0.001	0.333	0.059
Bubble	-0.114	0.304	-0.070	-0.064	0.154	-0.094	-0.022	0.152	-0.084
F ratio for regression	4.379*	0.001		8.273*	0.000		19.974*	0.000	
Adjusted R-squared	0.078			0.153			0.311		
Durban-Watson	1.698			1.806			1.816		
N. obs in regression	202			202			202		

Note: This table reports the results of the OLS –regressions on the full sample (PE-backed and non-PE-backed companies. The dependent variables are *Turnover Growth* (Regression 1), *EBIT/Sales* (Regression 2) and *EBIT/Assets* (Regression 3) in the three years after the buyout. The variable *Private Equity* is a dummy variable taking the value 1 for buyout firms and 0 elsewhere. *Turnover_0*, *Profitability_0*, *Gearing_0* are control variables and measure respectively turnover, operating EBIT/Assets and debt-equity ratio of the company at the year of the buyout. *Bubble* is a dummy taking the value 1 for buyouts occurring in the years 2005-2007 and 0 elsewhere. Coefficients that are significantly different from zero are indicated in bold. Levels of significance reported: *<0.01, **<0.05, ***<0.1. Standardized coefficients indicate the magnitude of effects.

When observing the regression for post-buyout turnover growth (model 1), one can examine that the model has a significant explanatory power at the 1% level ($F=4.379$, $p=0.001$). The adjusted R-squared reports a value of 0.078, indicating that the model explains 7.8% of the variance in turnover growth. The *Private Equity* variable is positive in sign and significant at the 5% level ($p=0.012$). In order to compare magnitudes of the effects, I also reported standardized regression coefficients. Private Equity has the strongest effect on the change in turnover growth, as a one-standard-deviation increase in the *Private Equity* variable is associated with a 0.184-standard-deviation increase in the company's post-buyout turnover growth. This is in line with Meuleman et al. (2009), who report a higher sales growth for PE-backed companies in the three years following the buyout compared to non-PE-backed companies and that the higher growth is at least partly due to the extent of value adding services delivered by PE firms.

Moving to the profitability regressions, model 2 for post-buyout EBIT/Sales shows that the *Private Equity* variable is once more significant at the 5% level ($p=0.031$) and positive in sign. In addition, the model as a whole is highly significant at the 1% level ($F=8.273$, $p=0.000$) with an adjusted R-squared of 15.3%. This suggests that PE firms have a positive and significant influence on post-transaction efficiency levels. This is in line with previous research (Nikoslainen & Wright, 2007; Acharya et al., 2013, Alperovych et al., 2013), lending support to the literature that PE firms use their experience to enter substantial organizational changes and strategic changes in order to improve EBIT Margins immediately after the LBO transaction.

But whilst positive in sign in the EBIT/Assets –regression (model 3), *Private Equity* achieves no statistical significance in this model ($p=0.138$). This is not in line with Cressy et al. (2007), who find a strong significant effect of PE on post-buyout EBIT/Assets. Closest to this result is the finding of Meuleman et al. (2009) who use ROCE (return on capital employed) as a profitability measure. ROCE was calculated by dividing EBIT by total assets from which current liabilities were subtracted. Meuleman et al. (2009) also found no significant effect of PE on the change in ROCE following the buyout. Nonetheless, the results of the regressions show that PE-backed buyouts experience higher post-buyout turnover growth and EBIT margins compared to the matched sample of non-PE-backed companies and that this difference is at least partly due the superior governance of PE firms.

Moving to the effect *Profitability_0* on post-buyout performance, Table 11 shows that the initial profitability of the company is significant in the growth regression (at the 5% level) and highly significant in both the profitability regressions (at the 1% level). In addition, the predictor shows strong magnitudes of effects and is positive in sign for all models, indicating

that the companies' initial profitability is an important factor for their success in the years that follow. As mentioned in the literature, Acharya et al. (2009) suggest that PE firms select companies in a segment with relatively high EBITDA levels so it should be noted that PE firms may select companies that are (at least initially) better performers.

When observing the other effects on post-buyout performance, I note in passing that initial gearing has no effect on either post-buyout EBIT/Sales or EBIT/Assets of the PE-backed companies. Leverage does seem to generate faster growth, as *Gearing_0* is significant in the model for turnover growth ($p=0.023$) and positive in sign. However, there seems no systematic effect on profitability. This is in line with the findings of Cressy et al. (2007), who also find no significant positive relationship between initial gearing and post-buyout profitability of PE-backed companies. The authors only find a marginal effect on turnover growth, but this is rather weak in the three years after the buyout. In a similar U.K. study, Nikoskelainen and Wright (2007) examined a sample of 321 buyouts (which include failures) but also find no significant effect of leverage on profitability improvement. As regards to macro effects, it should be noted that there is no systematic effect on either profitability or growth. The coefficients are negative in sign and none of the effects are significant.

(ii) Regressions for PE-backed firms (subsample)

Finally, Table 12 and Table 13 present the results of the regressions regarding the hypotheses of this chapter. Again, Durbin-Watson's statistic is between 1.5-2.5 for all regressions so independence of error terms can be assumed for all models. In Table 12 one can find a summary of the regressions regarding the effect of industry specialization on companies' turnover growth, EBIT/Sales and EBIT/Assets, whilst controlling for other possible factors that might influence post-buyout performance. To start with Hypothesis 1, Table 12 shows that the regression (model 1) has no statistically significant explanatory power ($F=1.217$, $p=0.288$). The adjusted R-squared reports a positive value of 0.023, which indicates that the model explains only 2.3% of the variance in turnover growth. This is in line with Cressy et al. (2007), who also find no significant explanatory power of their regression in relation to turnover growth. As the regression has no significant explanatory power and does not prove to have a strong tendency towards explaining the variance in turnover growth, no effort will be taken to further analyze the individual results. Further, Meuleman et al. (2009) examined the effect of PE industry specialization on turnover growth whilst controlling for other factors that may influence performance, however no significant positive impact on growth of the post-buyout firm was

Table 12

Summary regressions for PE firms' turnover growth, operating profitability and operating efficiency in the three years after the buyout (impact of industry specialization)

Variable	(1) Turnover Growth			(2) EBIT/Sales *100			(3) EBIT/Assets *100		
	Coefficient	Significance (Standardized)		Coefficient	Significance (Standardized)		Coefficient	Significance (Standardized)	
		Level	Coefficient		Level	Coefficient		Level	Coefficient
PE Industry Specialized	-0.069	0.772	-0.032	-0.127	0.182	-0.141	-0.016	0.628	-0.044
Turnover_0	-4.766E-07	0.114	-0.170	-2.523E-07**	0.037	-0.218	-2.442E-08	0.556	-0.053
Profitability_0	-0.361	0.429	-0.082	0.543*	0.004	0.298	0.404*	0.000	0.557
Gearing_0	0.015**	0.028	0.227	0.005***	0.071	0.179	0.009**	0.047	0.172
Independent PE	0.080	0.790	0.030	-0.085	0.475	-0.078	-0.077***	0.066	-0.176
PE Size	-1.600E-08	0.731	-0.047	1.728E-08	0.353	0.123	3.788E-09	0.558	0.068
Syndicated	0.304	0.512	0.068	-0.045	0.806	-0.025	0.034	0.594	0.047
PE Experience	0.001	0.364	0.149	-3.887E-04	0.319	-0.158	-1.618E-04	0.233	-0.164
PE Age	-0.012	0.169	-0.182	0.003	0.378	0.112	-4.587E-05	0.970	-0.004
Target age	0.001	0.891	0.015	0.000	0.910	0.012	0.001	0.164	0.126
Bubble	-0.149	0.457	-0.077	-0.086	0.280	-0.107	-0.034	0.226	-0.105
F ratio for regression	1.217	0.288		1.929**	0.046		5.111*	0.000	
Adjusted R-squared	0.023			0.093			0.311		
Durban-Watson	1.692			1.781			1.804		
N. obs in regression	101			101			101		

Note: This table presents a summary of the OLS regressions for PE-backed firms and the impact of industry specialization on post-buyout performance. The dependent variables are *Turnover Growth* (Regression 1), *EBIT/Sales* (Regression 2) and *EBIT/Assets* (Regression 3) in the three years after the buyout. The variables *PE Industry Specialized* and *Independent PE* are dummy variables taking the value 1 if the company is acquired respectively by an industry-specialized PE firm or by an independent PE firm and 0 elsewhere. *Turnover_0*, *Profitability_0*, *Gearing_0* and *Target Age* measure respectively turnover, operating EBIT/Assets, debt-equity ratio and age of the target company at the year of the buyout. *PE Size* encompasses the PE firm's total capital under management. *Syndicated* is a dummy variable taking the value 1 for syndicated buyouts. *PE Experience* encompasses the experience of the acquiring PE firm measured as the total number of investments of the lead PE firm up until the buyout. *PE Age* is the age of the PE firm at the time of the buyout. *Bubble* is a dummy taking the value 1 for buyouts occurring in the years 2005-2007 and 0 elsewhere. Coefficients that are significantly different from zero are indicated in bold. Levels of significance reported: *<0.01, **<0.05, ***<0.1. Standardized coefficients indicate the magnitude of effects.

Table 13

Summary regressions for PE firms' turnover growth, operating profitability and operating efficiency in the three years after the buyout (impact of stage specialization)

Variable	(1) Turnover Growth			(2) EBIT/Sales *100			(2) EBIT/Assets *100		
	Coefficient	Significance Level	(Standardized) Coefficient	Coefficient	Significance Level	(Standardized) Coefficient	Coefficient	Significance Level	(Standardized) Coefficient
PE Stage Specialized	-0.335	0.172	-0.150	0.057	0.566	0.061	-0.002	0.952	-0.006
Turnover_0	-4.386E-07	0.141	-0.156	-2.461E-07**	0.043	-0.212	-2.277E-08	0.584	-0.049
Profitability_0	-0.450	0.325	-0.102	0.566*	0.003	0.311	0.405*	0.000	0.558
Gearing_0	0.015**	0.024	0.231	0.005***	0.059	0.188	0.002**	0.043	0.175
Independent PE	0.126	0.667	0.047	-0.137	0.249	-0.125	-0.082**	0.048	-0.187
PE Size	-1.108E-08	0.810	-0.033	1.836E-08	0.328	0.131	4.034E-09	0.533	0.072
Syndicated	0.280	0.541	0.063	-0.010	0.959	-0.005	0.038	0.557	0.051
PE Experience	0.001	0.429	0.128	-2.689E-04	0.491	-0.109	-1.515E-04	0.262	-0.154
PE Age	-0.013	0.125	-0.200	0.003	0.467	0.092	-1.355E-04	0.909	-0.012
Target age	0.000	0.930	0.009	0.001	0.706	0.039	0.001	0.139	0.133
Bubble	-0.232	0.261	-0.120	-0.077	0.359	-0.096	-0.035	0.232	-0.108
F ratio for regression	1.407	0.184		1.766***	0.072		5.076*	0.000	
Adjusted R-squared	0.043			0.078			0.310		
Durban-Watson	1.738			1.764			1.804		
N. obs in regression	101			101			101		

Note: This table presents a summary of the OLS regressions for PE-backed firms and the impact of stage specialization on post-buyout performance. The dependent variables are *Turnover Growth* (Regression 1), *EBIT/Sales* (Regression 2) and *EBIT/Assets* (Regression 3) in the three years after the buyout. The variables *PE Industry Specialized* and *Independent PE* are dummy variables taking the value 1 if the company is acquired respectively by an industry-specialized PE firm or by an independent PE firm and 0 elsewhere. *Turnover_0*, *Profitability_0*, *Gearing_0* and *Target Age* measure respectively turnover, operating EBIT/Assets, debt-equity ratio and age of the target company at the year of the buyout. *PE Size* encompasses the PE firm's total capital under management. *Syndicated* is a dummy variable taking the value 1 for syndicated buyouts. *PE Experience* encompasses the experience of the acquiring PE firm measured as the total number of investments of the lead PE firm up until the buyout. *PE Age* is the age of the PE firm at the time of the buyout. *Bubble* is a dummy taking the value 1 for buyouts occurring in the years 2005-2007 and 0 elsewhere. Coefficients that are significantly different from zero are indicated in bold. Levels of significance reported: *<0.01, **<0.05, ***<0.1. Standardized coefficients indicate the magnitude of effects.

found. Overall, Hypothesis 1 is not supported.

Considering Hypothesis 2, which predicts the post-buyout EBIT/Sales of an PE-backed company to be higher if the lead PE firm is specialized in the industry in which the company is located, Table 12 (model 2) shows that PE industry specialization has no significant effect ($p=0.182$) and is negative in sign. The regression as a whole is statistically significant at the 5% level ($F= 1.929$, $p=0.046$). Whilst controlling for other factors that might influence post-buyout EBIT/Sales, the model reports a marginal adjusted R-squared of 9.3% ($R^2= 0.093$). As regards to the effects that the independent variables have on the company's profitability over the post-buyout period, one can observe a significant negative effect of the company's size in the year of the buyout. In contrast, the company's initial profitability- and gearing have a significant positive impact on the change in post-buyout EBIT/Sales. When comparing the magnitudes of effects, one can observe that the company's initial profitability has the strongest effect on the change in returns, as a one-standard-deviation increase in the company's initial profitability is associated with a 0.298-standard-deviation increase in the company's post-buyout EBIT/Sales. Nevertheless, in contrast to Cressy et al. (2007) PE industry specialization has no significant effect and Hypothesis 2 has to be rejected.

As regards to Hypothesis 3, which predicts that greater PE industry specialization is associated with an improvement in post-buyout EBIT/Assets, the regression (Table 12, model 3) is born out strongly with a significant explanatory power at the 1% level ($F=5.111$, $p=0.000$). The adjusted R-square reports a positive value of 0.311, indicating that the model explains 31.1% of the variance in the post-buyout operating EBIT/Assets. However, the effect of *PE Industry Specialized* is once again not significant ($p=0.628$) and negative in sign, lending no support to Hypothesis 3. Thus, against expectations and in contrast to the findings of Cressy et al. (2007), PE industry specialization is not a useful strategy for gaining competitive advantage over its peers. This is in line with Meuleman et al. (2009), who find no significant effect of specialization on the change in ROCE following the buyout. The results suggest that the advantages of being specialized in a certain industry does not seem to outweigh the countervailing higher risk from lower portfolio diversification. Moving to the other individual relationships, it can be observed that *Profitability_0* is highly significant at the 1% level and positive in sign. In addition, the company's initial profitability has the strongest magnitude of the effects once more, indicating that past performance exerts a strong upward effect on post-buyout performance. Likewise, Table 12 shows that *Gearing_0* has a significant positive impact on all three performance measures and is positive in sign all regressions. In addition, the effects are quite substantial in magnitude (0.227, 0.179 and 0.172 respectively). Again, this suggests

that there may be some upward movement of returns as a consequence of leverage (Guo et al., 2011; Cumming et al., 2007). As regards to all other explanatory variables, no significant result has been found.

Moving on to Hypotheses 4, 5 and 6 regarding PE specialization by buyout/acquisition stage, Table 13 shows the output of the final regressions. Examining model 1 that predicts turnover growth, it can be observed that the model fails completely once more ($F=1.407$ $p=0.184$). Therefore, further in-depth analysis of the individual relationships in the model will be futile and Hypothesis 4 has to be rejected.

As regards to Hypothesis 5, Table 13 shows that the regression for EBIT/Sales (model 2) has a statistically significant explanatory power at the 5% level ($F=1.766$, $p=0.072$). The adjusted R-squared reports a positive value of 0.078, which indicates that the model explains only 7.8% of the variance in EBIT/Sales. Further, a higher intensity of PE buyout specialization is not associated with improvements in EBIT/Sales following the buyout. This is not in line with expectations and thus lending no support for Hypothesis 5. Not surprisingly, initial profitability and gearing are once again significant ($p=0.003$ and $p=0.059$ respectively), positive in sign and quite substantial in magnitude, thereby amplifying the importance of these factors.

Finally, model 3 in Table 13 uses EBIT/Assets in the three years following the buyout as a profitability measure. It was expected that PE firms specialized in the buyout/acquisition stage of the acquired company should yield higher returns in terms of post-buyout EBIT/Assets as compared to PE firms not so-specialized. In the Welch ANOVA-analysis I found evidence that a statistical difference between the two groups exists and that specialized PE firms earned lower returns compared to non-specialized PE firms. However, as explained the Welch ANOVA-analysis does not tell us what causes the difference in returns. The regression shows that stage specialization does in fact play no important role in the post-buyout profitability of the firm. The *PE stage specialization* coefficient reports a negative value of -0.002 and is not significant (0.952), indicating that stage specialization adds nothing to the profitability of the PE firm's typical investment. In addition, the model as a whole is highly significant ($F=5.076$, $p=0.000$) with an adjusted R-square of 31%, thus the model has a relative strong explanatory power. Therefore, Hypothesis 6 is also not supported. This is in line with Cressy et al (2007), who also find no significant effect of buyout specialization on the change in EBIT/Assets following the buyout. Moving to the individual relationships, *Profitability_0* and *Gearing_0* are once more significant at the 1% level, suggesting that initial profitability and gearing play an important role in the post-buyout profitability of acquired companies. As regards to the significance of *Profitability_0* in all regressions, this raises expectations that PE firms are

merely better at picking the winners since no significant relationship has been found between PE specialization and post-buyout performance.

3.3 Conclusion

In this chapter, an empirical test of six hypotheses is conducted in order to learn more about the impact of the PE form itself and PE specialization by industry or stage on the post-buyout performance of acquired companies in the Benelux – and in particular the improvement in turnover growth and operating profitability. To test these hypotheses, I constructed a sample of 101 buyouts and a control sample of industry peer groups over the period 2003-2011 and collected accounting information from years 0 to +3 after the buyout. Considering all observed variables, their coefficient and their significance in the regressions, the part where one needs to draw conclusions remains challenging. However, I do observe some common results with existing literature on post-buyout performance.

First, to summarize my findings in relation to the superior performance of PE, buyouts are associated with significant increases in turnover growth and EBIT scaled by sales or assets compared to non-buyouts. In addition, the change in growth and EBIT margin is at least partly due to the value adding services of PE firms in relation to governance and operational changes. As regards to the change in EBIT/Assets following the buyout, no systematic effect of PE involvement has been found. Nonetheless, these results emphasize the superior performance of buyouts and the ability of PE firms to add value to investee companies once more.

Moving to the specialization effect in PE the first three hypotheses focused on the impact of PE industry specialization on post-buyout performance. As regards to turnover growth, it was expected that buyouts backed by industry specialized PE firms would grow faster than buyouts by not-so specialized PE firms. However, no evidence to support this expectation has been found. This is in line with research done by Cressy et al. (2007) and Meuleman et al. (2009), who also found no significant effect on turnover growth following the buyout. Whilst PE-backed buyouts experience higher growth compared to their industry peer groups, the conclusion can be made that industry specialization has no systematic effect on growth. More interesting are the effects of PE industry specialization on the buyout company's post-buyout operating profitability. The Welch ANOVA test showed that PE firms specialized in the buyout company's respective industry experienced lower returns compared to PE firms not so specialized. In line with these results, I found controlling for a range of factors that over the first three post-buyout years PE industry specialization showed no significant effect in both of

the profitability regressions. Therefore, the conclusion can be made that PE industry specialization does in fact play no important role in the post-buyout performance of acquired companies.

The final three hypotheses described the expectations regarding the effect of PE stage specialization on post-buyout performance. In this research no evidence has been found to support the assumption that greater PE buyout specialization increases turnover growth. In fact, the Welch ANOVA test showed that companies acquired by generalists experienced higher turnover growth in the first three post-buyout years compared to companies acquired by specialists. The difference between the groups was economically significant. Further, with respect to Hypothesis 5 and 6 and in line with the Welch ANOVA results, I found no significant effect of buyout specialization on either post-buyout EBIT scaled by sales or assets once more. For example, the results indicated that companies backed by generalists experienced on average higher returns (11.25%) in terms of EBIT/Assets compared to buyouts backed by specialists (10.5%). In relation to these results, the conclusion can be made that also buyout specialization is not a very useful strategy for gaining competitive advantage over peers. These findings are not in line with the results of Cressy et al. (2007), who find that buyout specialization has no effect on profitability but may provide a spur to growth.

Remarkably and in line with Cressy et al. (2007), this study showed that the profitability of the PE-backed company in the buyout year played an important role in explaining post-buyout profitability. This raises expectations that PE firms may select targets that are initially better performers, indicating that skill in investment selection and financial engineering techniques may play a more important role in the value creation process of buyouts than managerial incentives. Furthermore, the company's initial gearing is borne out to play a marginal role in the target's post-buyout operating profitability, suggesting that there may be some upward movement of returns as a consequence of leverage.

4. CONCLUSION & DIRECTIONS FOR FUTURE RESEARCH

In recent years, the specialization effect in PE has become an important phenomenon in the M&A industry. PE firms are increasingly selecting their investments based on specific industries or stage of development, with the aim of gaining deeper industry or stage expertise. This thesis has looked into the role of specialization in PE and its impact on post-buyout performance of acquired companies. This research contributes to the existing literature on three major areas. First, this research contributes to the literature that examine post-buyout performance of acquired companies in the Benelux. Second, it contributes to the literature that examine buyouts which occurred during the second wave of buyouts and thereafter. Finally, this research contributes to the literature that examine the role of organizational and investment strategy differences amongst PE firms and their possible impact on the selection and post-buyout performance of acquired companies.

There are numerous factors that explain the post-buyout performance of acquired companies. First, the empirical study in this thesis shows controlling for a range of factors that buyouts experience higher growth and profitability over the first three post-buyout years compared to non-buyouts and that these increases in performance are at least partly due to the strong governance of PE firms. Further, it should be mentioned that the profitability of the PE-backed company in the year of the buyout showed a significant effect in raising post-buyout performance in all regressions. Although my findings suggest that the governance and operational engineering of PE firms are important elements in the success of PE investment activity, the significance of initial profitability suggests that PE firm selection decisions is at least if not more important in raising post-buyout performance than PE firm monitoring and advise. Third, the most important part of this study shows that PE specialization in terms of industry or stage is not associated with higher levels of either turnover growth or operating profitability. This can be explained by a number of reasons.

First, previous literature has acknowledged the fact that PE firms may hire specialists from outside the firm by using their extensive network of contacts in various industries that can be exploited to the benefit of the buyout transaction (Berg & Gottschalg, 2003; Kaplan & Strömberg, 2009). Second, PE firms may select targets where there's already a competent management team in place (Acharya et al. (2009). This way PE firms can benefit from the buyout companies' skills and expertise, thereby offsetting the disadvantage of having less specialized expertise themselves (Acharya et al., 2009). Finally, previous literature suggests that PE funds are often specialized within their organization (Lossen, 2007; Aigner et al., 2008).

From this perspective, there might be experts for the different financing stages and industries who, together, create a diversified and well-performing organization. Overall, this thesis concludes that the advantage of being specialized does not outweigh the increased costs due to reduced portfolio diversification.

However, recalling the adopted research design, the sample and data sources, the constructed variables and the derived results it should be mentioned that this thesis – as the case in all research papers – has its limitations too. Although I do observe similar results with existing literature on post-buyout performance, a critical eye should be directed to the boundaries and limitations of this research and suggestions for future research should be given. First, the explanatory power of this research is limited due to the fact that this study examined a relatively small sample. Although a sample size of 50-100 buyouts is common in similar research (Kaplan, 1989; Bergström et al., 2007; Alperovych et al., 2013), small sample sizes might show biased results. In addition, the number of observations are quite imbalanced between the groups within the sample (specialists vs. generalists), thereby making the results more difficult to interpret. Several databases have been used in this thesis to overcome the issue of a small sample. However, due to missing data it was further impossible to create a larger sample. As a relatively small sample size has been used, the results should be interpreted with caution.

Second, this study ignores the fact that the buyout companies' skills and expertise could play an important role in raising post-buyout performance. If PE firms select targets where there's already a competent management team in place, this raises expectations that the performance of buyout companies following the buyout is at least partly due to the buyout company's expertise. In contrast, if PE firms select target's where there's an extremely underperforming management team in place, this raises expectations that PE firms simply select underperforming companies. Hence, for a repetitive study it is suggested to take into account the capabilities of the target's management and PE firm selection decisions.

Third, as regards to the constructed variables in this thesis, one should interpret the specialization index adopted from Cressy et al. (2007) with caution as the index has certain weaknesses. For example, for a lead PE firm that was involved in a relatively small amount of investments, one deal more or less in a certain industry or stage decided if the PE firm was categorized as specialized or not. This could result in biased outcomes. Furthermore, the specialization index is currently focused on firm-level specialization. However, as PE funds are often specialized within their organization a paradox might arise if a PE firm is composed of multiple specialized funds in different industries or financial stages, thereby appearing to be a

generalist in Cressy et al.'s (2007) specialization index. Hence, it might be worthwhile for future research to validate whether the PE firm in the sample is a specialist or not by taking other techniques into account that define specialism.

5. BIBLIOGRAPHY

- Acharya, V. V., Gottschalg, O. F., Hahn, M., & Kehoe, C. (2013). Corporate governance and value creation: Evidence from private equity. *Review of Financial Studies*, 26(2), 368-402.
- Acharya, V. V., Hahn, M., & Kehoe, C. (2009). Private equity target selection: Performance and risk measurement based on propensity score matching. Unpublished working paper, London Business School.
- Aigner, P., Albrecht, S., Beyschlag, G., Friederich, T., Kalepky, M., & Zagst, R. (2008). What Drives PE? Analyses of Success Factors for Private Equity Funds. *The Journal of Private Equity*, 11(4), 63.
- Alperovych, Y., Amess, K., & Wright, M. (2013). Private equity firm experience and buyout vendor source: What is their impact on efficiency?. *European Journal of Operational Research*, 228(3), 601-611.
- Axelson, U., Jenkinson, T., Strömberg, P., & Weisbach, M. S. (2013). Borrow cheap, buy high? The determinants of leverage and pricing in buyouts. *The Journal of Finance*, 68(6), 2223-2267.
- Berg, A., & Gottschalg, O. F. (2005). Understanding value generation in buyouts. *Journal of Restructuring Finance*, 2(01), 9-37.
- Bergström, C., Grubb, M., & Jonsson, S. (2007). The operating impact of buyouts in Sweden: A study of value creation. *The journal of Private equity*, 11(1), 22.
- Brigl, M., Herrera, A., Liechtenstein, H., Meerkatt, H., Prats, M. J., & Rose, J. (2008). The Advantage of Persistence: How the Best Private Equity Firms Beat the Fade. The Boston Consulting Group, Inc., and the IESE Business School of the University of Navarra.
- Brown, M. B., & Forsythe, A. B. (1974). The small sample behavior of some statistics which test the equality of several means. *Technometrics*, 16(1), 129-132.
- Brown, J., Goetzmann, W., Ibbotson, R. & Ross, S. (1992). Survivorship Bias in Performance Studies. *The Review of Financial Studies* 5(4), 553-580
- Chapman, J. L., & Klein, P. G. (2009). Value creation in middle-market buyouts: A transaction-level analysis.
- Cornelli, F., & Karakaş, O. (2008). Private equity and corporate governance: Do LBOs have more effective boards?. In *AFA 2009 San Francisco Meetings Paper*.
- Cornelius, P., Juttman, K., & de Veer, R. (2009). Industry cycles and the performance of

- buyout funds. *The Journal of Private Equity*, 12(4), 14.
- Cressy, R., Munari, F., Malipiero, A. (2007). Playing to their strengths? Evidence that specialization in the private equity industry confers competitive advantage. *Journal of Corporate Finance* 13, 647-669
- Cumming, D. J., & MacIntosh, J. G. (2003). Venture-capital exits in Canada and the United States. *The University of Toronto Law Journal*, 53(2), 101-199.
- Cumming, D., Siegel, S. D., Wright, M. (2007). Private equity, leveraged buyouts, and governance. *Journal of Corporate Finance* 13, 439–60.
- DePamphilis, D. (2009). Mergers, acquisitions, and other restructuring activities: An integrated approach to process, tools, cases, and solutions. Academic Press.
- Field, A. (2009). *Discovering statistics using SPSS*. Sage publications.
- Giot, P., & Schwienbacher, A. (2007). IPOs, trade sales and liquidations: Modelling venture capital exits using survival analysis. *Journal of Banking & Finance*, 31(3), 679-702.
- Gompers, P., Kovner, A., Lerner, J., Scharfstein, D. (2008). Venture capital investment cycle: the impact of public markets. *Journal of Financial Economics* 87, 1-23.
- Guo, S., Hotchkiss, E. S., & Song, W. (2011). Do buyouts (still) create value? *The Journal of Finance*, 66(2), 479-517
- Harris, R., Siegel, D., Wright, M. (2005). Assessing the impact of Management Buyouts on Economic Efficiency: Plant-level Evidence from the United Kingdom. *The Review of Economics and Statistics* 87(1), 148-153
- Hoskisson, R., Shi, W., Yi, X., Jin, J. (2013). The Evolution and Strategic Positioning of Private Equity Firms. *Academy of Management Perspectives* 27 (1), 22-38
- Jensen, M. (1986). Agency costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review* 76 (2), 323-329.
- Jungwirth, J. & Moog, P. (2004). Selection and support strategies in venture capital financing: high-tech or low-tech, hands-off or hands-on?. *Venture Capital* 6(2/3),1 05-123
- Kaplan, S. (1989). The effects of management buyouts on operating performance and value. *Journal of financial economics*, 24(2), 217-254.
- Kaplan, S. N. (1991). The staying power of leveraged buyouts. *Journal of Financial Economics*, 29(2), 287-313.
- Kaplan, S., Schoar, A. (2005), Private equity performance: Returns, persistence and capital flows, *Journal of Finance* 60(4), 1791–1823.
- Kaplan, S. (2009). The future of private equity. *Journal of Applied Corporate Finance*, 21(3), 8-20.

- Kaplan, S. N., & Strömberg, P. (2009). Leveraged buyouts and private equity. *The Journal of economic perspectives*, 23(1), 121-146.
- Koller, T., Dobbs, R., & Huyett, B. (2010). *Value: the four cornerstones of corporate finance*. John Wiley & Sons.
- Lichtenberg, F. R., & Siegel, D. (1990). The effects of leveraged buyouts on productivity and related aspects of firm behavior. *Journal of Financial Economics*, 27(1), 165-194.
- Ljungqvist, A., & Richardson, M. (2003). The cash flow, return and risk characteristics of private equity (No. w9454). National Bureau of Economic Research.
- Long, W. F., & Ravenscraft, D. J. (1993). LBOs, debt and R&D intensity. *Strategic Management Journal*, 14(S1), 119-135.
- Lossen, U. (2007). Performance of private equity funds: does diversification matter?. *Portfolio Strategies of Private Equity Firms: Theory and Evidence*, 95-133.
- Manigart, S., Lockett, A., Meuleman, M., Wright, M., Landström, H., Bruining, H. & Hommel, U. (2006). Venture capitalists' decision to syndicate. *Entrepreneurship Theory and Practice*, 30(2), 131-153.
- Manigart, S., De Waele, K., Wright, M., Robbie, K., Desbrières, P., Sapienza, H. J., & Beekman, A. (2002). Determinants of required return in venture capital investments: a five-country study. *Journal of Business Venturing*, 17(4), 291-312.
- Meuleman, M., Wright, M., Manigart, S., & Lockett, A. (2009). Private equity syndication: Agency costs, reputation and collaboration. *Journal of Business Finance & Accounting*, 36(5- 6), 616-644.
- Nikoskelainen, E., & Wright, M. (2007). The impact of corporate governance mechanisms on value increase in leveraged buyouts. *Journal of Corporate Finance*, 13(4), 511-537.
- Norton, E., & Tenenbaum, B. H. (1993). Specialization versus diversification as a venture capital investment strategy. *Journal of Business Venturing*, 8(5), 431-442.
- Opler, T., & Titman, S. (1993). The determinants of leveraged buyout activity: Free cash flow vs. financial distress costs. *The Journal of Finance*, 48(5), 1985-1999.
- Renneboog, L., Simons, T., & Wright, M. (2007). Why do public firms go private in the UK? The impact of private equity investors, incentive realignment and undervaluation. *Journal of Corporate Finance*, 13(4), 591-628.
- Schmidt, D., Steffen, S., & Szabo, F. (2010). Exit strategies of buyout investments: an empirical analysis. *The Journal of Alternative Investments*, 12(4), 58.
- Schwienbacher, A. (2005). An empirical analysis of venture capital exits in Europe and the United States. In *EFA 2002 Berlin Meetings Discussion Paper*.

- Smith, A. J. (1990). Corporate ownership structure and performance: The case of management buyouts. *Journal of financial Economics*, 27(1), 143-164.
- Stevens, J. P. (2009). *Applied Multivariate Statistics for the Social Sciences*. Taylor & Francis.
- Templeton, G. F. (2011). A two-step approach for transforming continuous variables to normal: implications and recommendations for IS research. *Communications of the Association for Information Systems*, 28(4), 41-58.