Secondary Buyouts

A Specialized Strategy of the Private Equity Firm affecting the post-SBO Operating Performance of the Portfolio Company

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ABSTRACT

This paper examines the effects of a Private Equity (PE) firm's specialized investment strategy on the post-secondary buyout (SBO) operating performance of the portfolio company. SBOs are financial transactions in which both the buyer and seller are PE firms. The rise of SBOs has raised several concerns regarding value creation in these transactions. Previous research found that the returns of SBOs are significantly lower than primary buyouts (PBOs). Segmentation of the lead PE firm can generate insight which transactions create value. Practitioners found that specialization has positive effects on operating profitability in PBOs. Our study contributes to existing literature by examining the portfolio company's post-SBO performance with regards to a PE firm's specialization strategy based on industry and geographic region. The sample in this study contains 115 SBOs of UK-based portfolio companies during the period 2007 to 2012. We find that industry specialization enhances post-SBO operating profitability whereas a specialized focus on geographic region does not improve post-SBO profitability. Additionally, we find no statistically significant results regarding a specialized investment strategy on post-SBO turnover growth.

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF FIGURES & TABLES

Figures

Tables

INDEX OF ABBREVIATIONS

BvD ID	Bureau van Dijk Identification Number
CEO	Chief Executive Officer
EBIT	Earnings before Interest & Tax
EBITDA	Earnings before Interest, Tax, Depreciation & Amortization
EMEA	Europe, Middle-East and Africa
GBP	British Pound
GP	General Partner
HHI	Herfindahl-Hirschmann-index
ICA	Index of Competitive Advantage
IPO	Initial Public Offering
IRR	Internal Rate of Return
LBO	Leveraged Buyout
LP	Limited Partner
LPE	Listed Private Equity
MBO	Management Buyout
MIRR	Modified Internal Rate of Return
MSCI	Morgan Stanley Capital Index
OLS	Ordinary Least Squares
PBO	Primary Buyout
PE	Private Equity
PME	Public Market Equivalent
ROA	Return on Assets
SBO	Secondary Buyout
SMBO	Secondary Management Buyout
VC	Venture Capital
US	United States of America

1. INTRODUCTION

1.1. Background

The Private Equity (PE) industry has experienced tremendous growth (Cressy, Munari & Malipiero, 2007) and today manages roughly $3 trillion worth of assets, mostly associated with leveraged buyouts (LBOs). The PE industry is often portrayed as professionals scouring the earth for investment opportunities and enhancing the value of these diamonds-in-the-rough (The Economist, 2014a) through rigorous governance mechanisms (Jensen, 1986, 1989). Recently, PE firms have resorted to buying and selling portfolio companies to each other (Bonini, 2015). These transactions, known as secondary buyouts (SBOs), have increased from a rarity to represent 60% of the worldwide buyout activity (Bonini, 2015; Kaplan & Strömberg, 2009).

SBOs are motivated by either efficiency considerations or opportunistic behavior (Arcot, Fluck, Gaspar, & Hege, 2015). The rise of the market has raised several concerns regarding value creation for the limited partners (LPs) who invest in PE funds (Degeorge, Martin, & Phalippou, 2016). The transactions are particularly worrisome for LPs who own stakes in several PE funds as they could be represented in both the buy and sell side of the transaction (Degeorge et al., 2016; The Economist, 2014a).

An increase in committed but not yet invested capital indicates that PE firms are flooded with cash, even though investment opportunities are limited in the competitive market (Achleitner, Bauer, Figge & Lutz, 2012). Unspent capital comes with an opportunity cost (Arcot et al., 2015) as PE firms typically charge annual management fees on invested capital (Metrick & Yasuda, 2010). In parallel, the returns of SBOs are significantly lower than for primary buyouts (PBOs) (Bonini, 2015; Degeorge et al., 2016; Wang, 2012; Zhou, Jelic, & Wright, 2014). This results in agency costs since the PE firm aims to invest the unspent capital rather than maximizing the return for fund investors (Arcot et al., 2015).

The efficiency motive is related to the best-owner concept which states that the capabilities and experience of the parent company are related to the performance of the portfolio company (Goedhart, Koller, & Wessels, 2015). Several studies found that PE firm specialization is beneficial for the portfolio company (Arcot et al., 2015; De Clercq & Dimov, 2008; Hammer, Loos & Schwetzler, 2015; Wang, 2012).

1.2. Problem Statement

SBOs generate significantly lower returns to investors in comparison to PBOs (Bonini, 2015; Degeorge et al., 2016; Wang, 2012; Zhou, Jelic & Wright, 2014). However, since PE firms charge management fees on invested capital (Metrick & Yasuda, 2010), the PE firm has an incentive to maximally deploy the capital committed to the fund (Arcot et al., 2015). SBOs are attractive for PE firms with excess capital since the costs related to searching, screening and due-diligence practices are significantly lower (Bonini, 2015; Degeorge et al., 2016). This gives rise to agency conflicts between the GPs and LPs as the PE firm strives to maximally invest committed capital rather than ensuring high returns for investors.

In this paper, we focus on the perspective of the buying PE firm for the following reasons. Firstly, exits through SBOs are typically welcomed by the LPs on the sell side as the transaction results in quick and certain proceeds (Jenkinson & Sousa, 2015). Secondly, PE funds have a finite life which may require the selling PE firm to exit the investment even if there still is room for further operational improvements (Achleitner & Figge, 2014). The arguments for the PE firm on the buy side are questionable (Bonini, 2015; Wang, 2012; Wright et al., 2009).

A leveraged buyout (LBO) is a method to create value using a high leverage ratio, governance structure and operational restructuring (Jensen, 1989; Kaplan, 1989; Wang, 2012). Traditional arguments for LBOs include active monitoring, incentive alignments and constraining debt to encourage the portfolio company to improve (Jensen, 1986, 1989). These improvements are likely to generate a steep one-off increase in performance (Wright et al., 2009). Assuming that traditional governance mechanisms are already applied during the ownership of the first PE firm, the value creation potential in SBOs is questionable.

When governance mechanisms such as constraining debt, active monitoring and incentive alignments are in place, real operating performance growth can only be generated if the PE firm holds specific idiosyncratic knowledge and a skill set matching the newly acquired portfolio company (Jensen, 1993). This real growth can be realized by e.g. international expansion, in-depth industry knowledge, altering the business strategy of the acquired company or a new top management team (Wang, 2012). Even though the portfolio company has undergone a PBO, one cannot assume there is no value left to be captured in the SBO. As mentioned earlier, the previous owner may have chosen to exit early, leaving room for further efficiency gains (Achleitner & Figge, 2014). Furthermore, PE firms might apply different types

of value creation plans in the SBO. Under the ownership of the first PE firm, value creation might come from cost reduction or growth strategies, while the subsequent PE firm specializes in enhancing operating performance (Degeorge et al., 2016; Wang, 2012). Jensen (1989) conceptualized a vision, seeing the PE firm as a governance form due to the continuous process of operating performance improvements. Thus, the subsequent PE firm could further enhance the operating performance of the acquired company.

Existing research shows discouraging results. Portfolio companies acquired by management through secondary management buyouts (SMBO) display significant reductions in profitability and turnover growth (Zhou et al., 2014). Bonini (2015), Achleitner and Figge (2014), found no significant results concerning operational performance improvements of the portfolio company during an SBO. However, previous research indicates that complementary skill sets between the buyer and seller can enhance the performance of the portfolio company (Arcot et al., 2015; De Clercq & Dimov, 2008; Hammer et al., 2015; Wang, 2012).

The best-owner concept states that the capabilities and experience of the PE firm are related to the performance of the portfolio company (Goedhart et al., 2015). Segmentation of the lead PE firm can generate insights in which transactions are beneficial for the investors (Cressy et al., 2007; De Clercq & Dimov, 2008; Hammer et al., 2015). Cressy et al. (2007) found that portfolio companies exhibit significantly enhanced post-PBO operating performance when the buying PE firm is specialized in the industry of the portfolio company. This evidence supports the notion that a specialized investment strategy and skill set are beneficial for the acquired company. To our knowledge, this study is the first to investigate the effect of PE firm specialization on the portfolio company's post-SBO operating performance. The rapid rise of the SBO market coincides with concerns regarding value creation and agency conflicts. Further research is needed to investigate the rationale and value creation potential in SBO transactions.

1.3. Research Question & Purpose

This paper investigates the value creation potential in SBOs by concentrating on the strategic focus of the PE firm related to the characteristics of the portfolio company. The aim of this study is to outline the effects on post-SBO operating performance for the portfolio company due to a specialized investment strategy of the PE firm, matching the portfolio company. In other words, to what extent does specialization of the PE firm impact the post-SBO operating performance of the portfolio company?

1.4. Contributions

1.4.1. Academic

The main contribution of our study is to assess post-SBO operating performance of the portfolio company from a new perspective. Instead of focusing on general performance improvements in SBOs, we examine the influence of PE firm characteristics on the post-SBO operating performance of the portfolio company. From an academic perspective, this paper supports the best-owner concept (Goedhart et al., 2015). In line with previous studies, the results indicate that complementary skill sets of the buyer and seller can improve the operating performance of the portfolio company (Arcot et al., 2015; Cressy et al., 2007; De Clercq & Dimov, 2008; Hammer et al., 2015; Wang, 2012). This broadens the otherwise gloomy academic perception of SBO transactions.

1.4.2. Community

Institutional investors with stakes in multiple PE funds are likely to find themselves both on the buy and sell side of an SBO (Degeorge et al., 2016). These overlapping investments have raised controversy as LPs to some extent may buy companies from themselves. SBO transactions in which the LP is both on the buying and selling side, are commonly believed to infer significant additional transaction costs (The Economist, 2014a). However, as illustrated by Degeorge et al. (2016), overlapping investments do not generate additional transaction costs. LPs would still be paying two rounds of transaction costs: one at entry and one at the exit. Thus, alternative exits would only postpone the transaction costs. However, the overlapping investments problem does have further implications for LPs when considering the allocation of capital among PE funds. In case an institutional investor invests in PE funds with complementary skill sets, being more likely to be value enhancing, the LP might gain more in the eventuality of overlapping investments.

Previous research demonstrates that the motives to invest in SBOs are questionable and likely to result in agency costs for the LP (Arcot et al., 2015; Bonini, 2015; Degeorge et al., 2016; Wang, 2012; Zhou et al., 2014). This paper broadens the otherwise gloomy view of value creation in SBOs by showing that there are legitimate reasons to invest in SBOs when the buyer and seller possess complementary skill sets (Arcot et al., 2015; Cressy et al., 2007; Goedhart et al., 2015; Hammer et al., 2015; Wang, 2012).

Due to the competitiveness in the market, this evidence has real strategic implications for PE firms as this speaks in favor of specialization (Arcot et al., 2015; Cressy et al., 2007; Goedhart et al., 2015; Hammer et al., 2015; Wang, 2012) rather than the ongoing trend with large PE firms who diversify across a broad range of industries (The Economist, 2014b).

1.5. Outline

The paper is structured in seven main sections; introduction, theoretical framework, hypothesis, methodology, analysis & results, discussion & further implications and conclusion. The first section, the *introduction*, describes the background of the study, the problem discussion and the research question of this study. The second section, the *theoretical framework*, provides an overview of previous research regarding SBOs and PE firm specialization. The third section constructs the *hypotheses* to operationalize the research question. The fourth section, *methodology*, elaborates on the sample setting, data collection and variables. In addition, the validity and reliability of the study assess the credibility and generalizability of the results. The fifth section, *analysis & results,* elaborates on the conducted tests including an interpretation of the results with respect to the research question. The sixth section, *discussion & further implications*, discusses the findings of the study and proposes further fields of research. Lastly, the thesis is concluded, summarizing our findings.

2. THEORETICAL BACKGROUND

2.1. Secondary Buyouts

The rise of SBOs is captured by the increased frequency of these transactions (Bonini, 2015; Kaplan & Strömberg, 2009). In addition, portfolio companies stay longer under PE ownership, passing from one PE firm to another (Degeorge et al., 2016; Strömberg, 2008). SBOs are defined as transactions in which a PE firm (or group of PE firms) sells a portfolio company to another PE firm (or group of PE firms) (Arcot et al., 2015; Bonini, 2015; Degeorge et al., 2016; Wang, 2012). By definition, this excludes transactions in which managers buy the portfolio company (Nikoskelainen & Wright, 2007). In this paper; tertiary buyouts and fourth buyouts are classified as SBOs (Degeorge et al., 2016).

2.2. Structure of PE Funds

PE firms typically raise capital through PE funds, organized as limited partnerships with a finite life (Kaplan & Strömberg, 2009; Metrick & Yasuda, 2010). As illustrated in Figure 1, three parties are involved in the structure of a PE firm; limited partners (LPs), general partners (GPs) and the portfolio company. Institutional investors and wealthy individuals participate as LPs providing most of the capital. Once the closed-end fund is created, the PE fund is actively managed by investment managers who serve as GPs of the PE fund. Once capital is committed, LPs have few mechanisms to discipline the GPs (Arcot et al., 2015). As long as basic covenants are met, the LPs rely on compensation schemes as the main contractual mechanism (Kaplan & Strömberg, 2009). Exiting the fund is costly and typically subject to GPs approval. The income of PE firms consists of a fixed and a variable component, discussed at length in Appendix F (Kaplan & Strömberg, 2009; Metrick & Yasuda, 2010. PE firms obtain management fees as a percentage of invested or committed capital. In addition, they receive a variable component based on the performance of the fund. In Figure I, the typical structure of a PE fund is illustrated.

Figure I
Structure of a Private Equity Firm

The LPs' committed capital is managed by the GPs. The GPs use the funds to acquire portfolio companies and enhance their performance through active ownership. Towards the ending of the closed-end fund, the initial investment and excess return are distributed accordingly (HSBC, 2011).
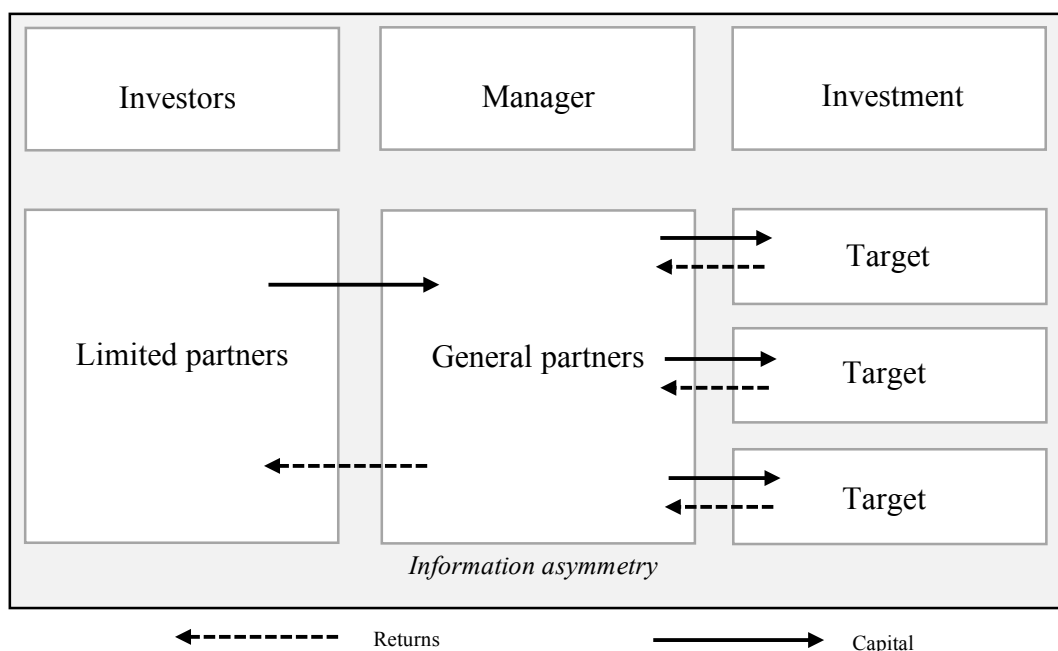
2.3. Misalignment of Incentives between LPs & GPs

The composition of a PE fund, especially the relationship between the LPs and GPs, is purely based on explicit contractual measures (Arcot et al., 2015; Kaplan & Strömberg, 2009; Steindl, 2013). The limited partnership structure gives the GP great freedom to maneuver. The LPs have limited mechanisms to exercise control. Accordingly, one can argue that this pre-occurring agency dilemma, within public companies, is shifted up the investment chain (Steindl, 2013). Due to the maturation of the PE industry and the rise of the SBOs (Achleitner & Figge, 2014; Degeorge et al., 2016; Hammer et al., 2015; Manchot, 2010), we believe that the interests of GPs and the LPs are diverging. One major problem is information asymmetry between the investment management (the GPs), and the LPs. Thus, the LPs are not able to perfectly assess the drivers and performance of newly acquired portfolio companies. For example, the LPs cannot interfere the GPs' willingness to take risk and diversions from the designated investment strategy. In addition, GPs want to maximize their own utility which

might influence the course of action even further. In other words, the GPs put their own interest before the LPs leading to a misalignment of fiduciary duties. SBOs, also described as "pass-the-parcel deals" by institutional investors, are a way to exploit self-interest. Eventually, this misalignment leads to the classical principal-agent conflict (Rose, 2011).

The GPs have an incentive to fully deploy the committed capital in the fund to maximize the collection of management fees (Degeorge et al., 2016). Ultimately, this setup will result in a conflict of interest between the LPs and GPs (Axelson et al., 2007). GPs who intend to invest in portfolio companies, to maximally deploy the committed capital, have incentives to be involved in SBOs as search costs are lower (Degeorge et al., 2016). Previous research has shown that SBOs executed late in the finite period of the closed-end fund, deliver less value creation for the LPs. We present a visualization of the principal-agent problem in Figure II.

Figure II
Principal-Agent Problem between the LPs and GPs

The LPs commit capital into the fund which is managed by the GPs. In this setting, information asymmetries create opportunities for the agent to maximize their own utility. For example, by acquiring portfolios through deploying late in the PE fund's investment period.
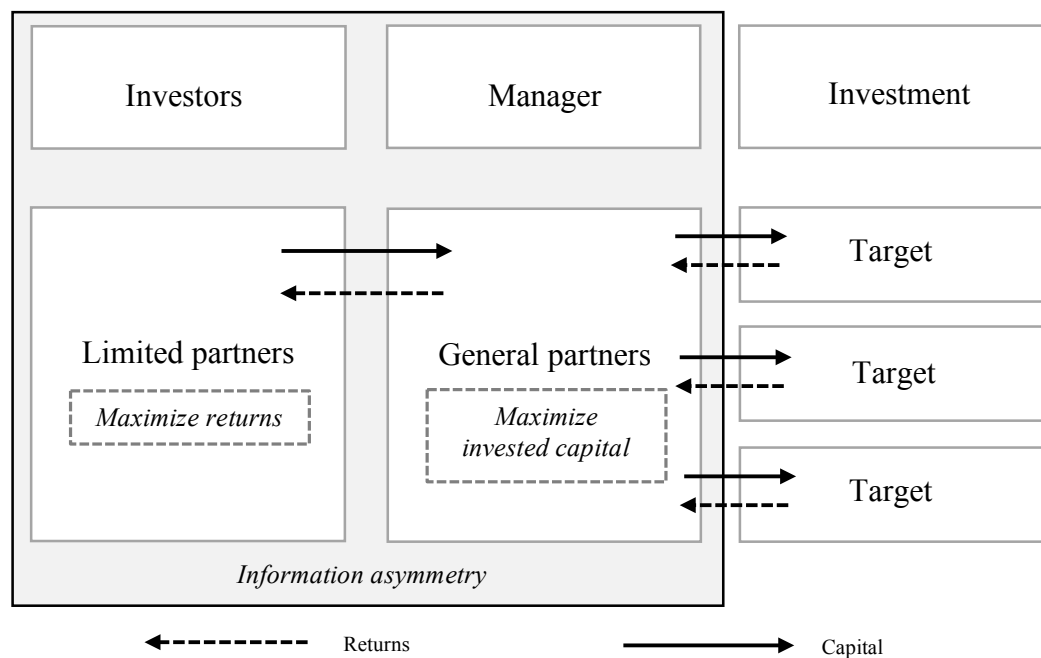
2.4. Non-Operational Drivers of SBOs

As previously stated, several studies found that SBOs exhibit lower operating performance improvements compared to primary buyouts (PBOs) (Bonini, 2015; Freelink & Volosovych, 2012; Jenkinson & Sousa, 2015; Wang, 2012). Degeorge et al. (2016) found that this occurs in particular for SBOs made late in the investment period. Achleitner et al. (2012), Achleitner and Figge (2014) found no difference in returns to LPs between SBOs and PBOs. This evidence indicates that operational value creation is unlikely to be the main driver of SBOs (Bonini, 2015).

2.4.1. Funds under Pressure

The life of a PE fund can be divided into two periods: the investment period and the harvesting period (Arcot et al., 2015). The GPs are expected to make investments in the first five years, called the investment period. The subsequent five years are known as the harvesting period. The PE funds reap the rewards of their investments by selling the fund's stakes in portfolio companies. PE funds with unspent capital, dry powder, at the end of the investment period, face pressure to deploy their capital for two reasons. The PE firms receive income as a percentage of the invested capital (Arcot et al., 2015; Metrick & Yasuda, 2010). Furthermore, funds with unallocated capital at the end of the investment period will have a hard time to raise capital for subsequent funds (Arcot et al., 2015). Dry powder puts pressure on the PE fund to generate income and ensure future funding. Funds with substantial amounts of dry powder are more likely to engage in suboptimal investments to create an investment record and use up the capital, thus minimizing the unspent capital (Arcot et al., 2015; Axelson et al., 2007; Degeorge et al., 2016). When funds under pressure engage in SBO transactions, they rely on less syndication and use less leverage to spend more equity capital (Arcot et al., 2015).

The pressure of allocating dry powder leads to suboptimal deals. If the selling PE firm does not see any value creation potential, exceeding the original costs of investment, it is willing to sell the portfolio company to another PE firm (Cumming & MacIntosh, 2003). Wang (2012) found that due to non-disclosure, a lack of regulations and the opaqueness of the PE industry, poor assets are traded at above-market prices. Achleitner et al. (2012) and Wang (2012) found in their samples that the purchase price of a portfolio company in SBOs is 7% respectively 16% more costly than PBOs. Higher prices paid results in weaker performance, occurring at the expense of investors (Arcot et al., 2015; Degeorge et al., 2016). Sousa (2010) argues that

questionable SBO transactions are used to manipulate returns by circulating these portfolio companies among a group of PE firms. Hence, the management fees of the GPs are maximized.

2.4.2. Market Conditions

When assessing the capital structure and pricing of a buyout, macroeconomic factors are critical determinants (Axelson et al., 2007). Jenkinson and Sousa (2015), Wang (2012) found that market conditions drive SBO transactions. The authors argue that SBOs are more likely to occur in environments with low IPO volumes and favorable debt conditions. An increase in market uncertainty limits IPO attractiveness, indicating that IPO volumes relate to equity market conditions. Sousa (2010) found that PE firms engage in SBOs as an exit strategy to exploit favorable debt market conditions. In general, credit market conditions influence the investment behavior of the PE firm. Kaplan and Strömberg (2009) found that PE investors respond to systematic mispricing in the debt and equity market. For example, when the cost of debt is low compared to the cost of equity, a PE firm can engage in arbitrage. Achleitner et al. (2012) state that PE firms engage in market arbitrage between the debt and equity markets in addition to market arbitrage between the public and private markets. Baker and Wurgler (2000) argue that these market frictions lead to segmented debt and equity markets. Ljungqvist et al., (2008) found that buyout funds, thus PE firms, react to loosening credit market conditions by accelerating their investments. This evidence supports the notion that PE firms react to changes in the performance of capital markets, explaining the increase in SBOs during favorable debt market conditions.

2.5. Operational Drivers of SBOs

Traditional arguments for value creation in LBOs include high leverage, incentive alignments and active monitoring of the companies' management (Jensen, 1986, 1989). The free cash flow hypothesis predicts that companies with failing control functions and excess cash will be common targets. However, the resolution of agency problems is likely to generate a steep one-off change in performance (Wright et al., 2009). As a consequence, SBOs are likely to generate little, if any, incremental performance (Bonini, 2015; Wang, 2012). In such cases, real operating growth can only be achieved through implementation of new investments and strategies (Jensen, 1993). Operational changes may consist of cost-cutting, productivity enhancements, strategic changes, repositioning, acquisitions as well as management changes and upgrades (Acharya, Hahn, & Kehoe, 2009). Freelink and Volosovych (2012) found that management replacements in SBOs lead to higher operating performance.

2.5.1. Knowledge & Governance

Studies based on partner background concerning deal strategy and performance indicate that human capital is related to persistent and significant outperformance in PE deals (Acharya et al., 2009). The authors found that GPs with financial backgrounds are more likely to engage in successful M&A activity and GPs with operational backgrounds outperform in deploying organic strategies. Furthermore, Degeorge et al. (2016) found that complementary skill sets in terms of educational or professional backgrounds are associated with greater value creation in SBOs. This evidence supports the notion of the best-owner concept since PE partners add value to portfolio companies by applying skills they have accumulated over time (Acharya et al., 2009; Goedhart et al., 2015). In a related paper, Bottazzi, Da Rin and Hellmann (2008) argue that prior business experience is related to a higher frequency of shareholder activism. This gives a key insight to the notion that human capital is an important driver of the activities performed by the investors. The authors also found that investor activism has a positive effect on performance.

2.5.2. Investor Activism & Performance

The main motivation for investor activism is to increase the value of the portfolio company (Gillan & Starks, 1998). Value creation of the portfolio company is essential for a PE fund since earnings and the likelihood of raising a subsequent fund depends on the performance of the fund (Arcot et al., 2015; Metrick & Yasuda, 2010). Large institutional investors are typically not active in the governance of the portfolio company and generate low-performance improvements from investor activism (Gillan & Starks, 1998). Partially for this reason, institutional investors invest as LPs in closed-end funds managed by GPs that specialize in investment management, thus improving the performance of portfolio companies (Demaria, 2015; Jensen, 1986, 1989). Informed shareholders can more efficiently reduce agency costs of the portfolio company (Brav et al., 2008; Hochberg, 2012). Investment specialists such as Hedge Funds and VC firms exhibit significant improvements as a result of their active involvement (Brav et al., 2012). In line with the view that investors with the right skill set can improve the performance of the portfolio company through active involvement (De Long, 1990), we expect that GPs are able to improve the performance of the portfolio company through investor activism. Activism is associated with portfolio companies exhibiting increased payouts, operating performance and higher CEO turnover (Brav et al., 2008). The

linkage between knowledge, frequency of shareholder activism and performance of the portfolio company suggests that specialized PE firms are able to improve operating performance of the portfolio company to a greater extent than PE firms with a diversified investment strategy (Bottazzi et al., 2008).

2.6. Specialization

The ability to earn a rate of return higher than the cost of capital is related to the attractiveness of the market and the PE firm's competitive advantage (Grant, 1991). A PE firm can outperform peers when focusing on markets where they have a competitive advantage. In addition, the PE firm needs to identify its core competencies concerning organizational abilities and resources. A competitive advantage arises from primarily two sources: reduction of information asymmetry and uncertainty (Eisenhardt, 1989). Continuous investments and experience in a certain domain will develop the in-depth knowledge of that domain (Cohen & Levinthal, 1990). According to De Clercq and Dimov (2008), a PE firm can enhance the portfolio companies' performance if they solely invest in industries where they possess in-depth knowledge. PE firms utilize their industry- and operating-specific knowledge to identify attractive investment opportunities and deploy value creation (De Clercq & Dimov, 2008; Kaplan and Strömberg, 2009). PE firms with in-depth knowledge in particular domains will be able to provide better advice and more effective monitoring, as they are aware of the competitive environment in addition to the strengths and weaknesses of the portfolio company (Cressy et al., 2007; Eisenhardt, 1989). Due to the active role of this investor, similarities can be drawn to the role of corporate management. Grant (1988) states that the effectiveness of corporate managers is determined by similarities among the underlying businesses as the top management can apply similar knowledge to different businesses within the firm. The portfolio company's performance will improve when GPs invest in industries where they have in-depth knowledge (De Clercq & Dimov, 2008) and a competitive advantage (Grant, 1991).

3. HYPOTHESES

3.1. Industry Specialization versus Diversification on post-SBO performance

PE firms need to redefine their investment strategy in order to differentiate and gain a competitive advantage over their peers (Cressy et al., 2007). Existing research conducted in the field of PE investment performance mainly focuses on returns (Nikoskelainen & Wright, 2007). Researchers have reasoned that PE firms have different skill sets and therefore a different focus when identifying and developing value creation plans for potential portfolio companies. Portfolio companies have different characteristics concerning maturity, leverage position, geographic region and industry (Achleitner & Figge, 2014; Arcot et al., 2015; Wang, 2012). PE firms can have a diversified or specialized investment strategy regarding the buyouts of portfolio companies. If the investment history of the PE firm matches the industry of the portfolio company, one can qualify the PE firm as a specialist (Cressy et al., 2007). Continuous investments in a domain lead to in-depth knowledge of that domain (Cohen & Levinthal, 1990). Hence, PE firms with a narrow investment scope in specific industries can use their in-depth knowledge (De Clercq & Dimov, 2008) and competitive advantage (Grant, 1991) to enhance the performance of the portfolio company within that domain. Instead, diversified PE firms tend to screen and assess a broad selection of available investment opportunities (Hammer et al., 2015). Little research has been conducted to examine the effects of a specialized investment strategy. (Gompers et al., 2008) found that US venture capitalists tend to outperform peers when implementing industry specialization in their investment strategy. We expect that post-SBO operating performance of the portfolio company is enhanced when the PE firm applies an industry specialized investment strategy. To assess the effect of industry specialization on post-SBO performance of the portfolio company, the following hypotheses are constructed:

Hypothesis 1a: The post-SBO operating profitability of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on industry.

Hypothesis 1b: The post-SBO turnover growth of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on industry.

3.2. Geographic Specialization versus Diversification on post-SBO performance

In line with the tremendous growth of the PE industry, the scope of investments is becoming more globally-oriented (Kaplan & Strömberg, 2009). This gives the PE firms an incentive to

compose a particular investment strategy based on geographic region. Knill (2009) found that there is a distinction between a domestic and international geographic focus. Nowadays, investments of PE firms are widely scattered across regions. This enables the PE firm to discover investment opportunities in a broader scope. In addition, it potentially enables the portfolio company to expand into new markets. In line with previous research of the VC industry, practitioners found that corporate VCs prefer a broader geographic focus (Gupta & Sapienza, 1992). Thus, a specialized investment strategy based on geographic region would reduce the post-SBO operating performance.

When focusing on a portfolio company with a specific geographic location, value creation arises from investments and the development of specialized assets such as network ties (Lossen, 2007b). As mentioned in the context of industry specialization, continuous investments in a certain domain leads to competitive advantage which can be used to identify and exploit investment opportunities (Cohen & Levinthal, 1990; De Clercq & Dimov; 2008). According to Degeorge et al. (2016), PE firms with a country-specific, or regional, focus can improve the market position of the portfolio company in the corresponding market. However, it lacks to expand the firm's position further across markets as described above. The setting of the portfolio company will ultimately determine whether a narrow geographic focus enhances the performance. We expect that PE firms with regional expertise will enhance the post-SBO economic performance of the portfolio company. We created the following hypotheses to investigate the effect of geographic focus on post-SBO performance of the portfolio company;

Hypothesis 2a: The post-SBO operating profitability of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on geographic region.

Hypothesis 2b: The post-SBO turnover growth of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on geographic region.

4. METHODOLOGY

4.1. Sample Setting

To test our hypotheses, we constructed a data set consisting of SBOs performed by PE firms over the period 2007 to 2012. We chose this time frame in order to retrieve post-buyout financial data of the portfolio companies, to be able to analyze the developments three years after the buyout. Data is collected from SBOs of portfolio companies with its headquarters in the United Kingdom to prevent market conditions and different accounting standards interfering our results. The transaction data is retrieved from Capital IQ and Zephyr to enlarge our sample as the two databases provide complementary transactions. Zephyr is taken as our main database as it has the largest coverage of UK deals. Furthermore, Zephyr conveniently provides ID-numbers for all companies involved in the transactions, which matches the company specific filings in the database Orbis (Freelink & Volosovych, 2012). The total number of SBOs consisting of a UK portfolio company over the period 2007 to 2012 amounted to 433. The sample size is reduced to 181 observations, taking the transactions with the following data available; Acquirer PE firm, closing date, code names of the acquired companies and main industry.

4.2. Data Collection

We complement the SBO transaction data with information from the PE firm engaging in the SBO. Accordingly, we accessed Capital IQ to collect; PE firm name, their portfolio composition covering the time span 2006-2015 and the breakdown of these companies to industry classification and geographic region focus.

In the second stage of the data collection, the annual filings are obtained using the portfolio company's company code (BvD ID number) in Orbis. To assess the post-buyout performance and thus the impact of the PE firm, we took data available from 0 to +3 years after the SBO. As noted by Achleitner and Figge (2014); Bonini (2015), this selection does not allow us to test the long-term performance. However, Guo et al. (2011); Kaplan and Strömberg (2009) argue that PE firms implement most of the performance changes occur during the first two years. A benefit of using a three-year window is that it minimizes potential noise that can arise from using a longer window (Wang, 2012). To expand our sample, we manually cross-checked annual filings for missing data in Capital IQ since we faced several issues when collecting data as the PE industry is to a great extent exempted from public disclosure requirements (Kaplan

& Schoar, 2005). Moreover, due to frequent name changes of firms, data was missing and had to be compiled manually. After combining the data from Zephyr, annual filings of Orbis and Capital IQ for both the SBO transactions and involved PE firms, the final data set consisted of 115 SBOs.

4.3. Variables

4.3.1. Dependent Variables

The dependent variables used to measure the post-SBO economic performance of the company are operating profitability (Profitability) and turnover growth (Growth). The use of operating profitability as a variable to test firm performance has been adopted in previous research on buyouts (Cressy et al., 2007; Kaplan, 1989).

Operating profitability is computed as EBIT scaled by total assets for the three-year window (year +1 to year +3) post-SBO (Cressy et al., 2007). We use this measure instead of ROA since net income could be subject to financial engineering (Cressy et al., 2007) and discretionary accounting policies (Bonini, 2015). Besides, operating profitability is a measure of economic efficiency that focuses on real operating performance instead of one-time improvements to boost growth (Jensen, 1993).

$$Average\ profitability\ post\ SBO = \frac{\sum_{+1}^{+3}(100*\frac{EBIT}{Total\ Assets})}{3} \tag{1}$$

Turnover growth: is computed as the geometric mean of operating revenues three years after the SBO according to the formula below (Cressy et al., 2007). x_1 is the growth over year one post-SBO, x_2 is the growth over year two post-SBO, x_3 is the growth over year three post-SBO.

$$Geometric\ turnover\ growth\ post\ SBO = (\prod_{i=1}^{3} x_i)^{1/3} = \sqrt[3]{x_1 x_2 x_3} \tag{2}$$

4.3.2. Independent Variable: Dummy Industry Specialized_Match

To measure the effect of a PE firm's specialized investment strategy on the post-SBO operating performance of the portfolio company, we create a dummy variable that captures the match between industry specialization of the PE firm and the industry of the acquired company. To construct this variable, we have to measure the degree of specialization of the PE firm

according to industry. In the case of several PE firms, we have chosen the PE firm with the largest stake in the company or the PE firm explicitly stated as the lead investor (Cressy et al., 2007; De Clercq & Dimov, 2008), since the lead investor is more active in management and monitoring (Bottazzi et al., 2008). Based on previous literature covering technology specialization, we construct the Index of Competitive Advantage (ICA) for the PE firms in our sample (Archibugi & Pianta, 1994). The ICA determines the level of concentration in a specific industry relative to peers.

$$ICA_{ij} = (C_{ij} / C_{.j}) / (C_{i.} / C_{..}) \qquad (3)$$

The dot indicates the sum related to the data set and description below:

C_{ij} is the number of portfolio companies of PE firm i in industry j
$C_{.j}$ is the total number of companies invested in industry 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 industries)

The numerator of the ICA formula ($C_{ij} / C_{.j}$) represents the PE firm i's share of all investment in industry j and the denominator ($C_{i.} / C_{..}$) its share in all investments across all industries. In other words, the ICA_{ij} measures a firm's investment strategy relative to their peers.

In case the PE firm is qualified as a specialist within industry j, we can detect the match with the industry of the acquired. The dummy PE Specialized_Match takes the value one when the PE firm's industry specialization equals the industry of the acquired firm, otherwise zero. To test various degrees of specialization, two specialization variables are constructed. The first variable assumes the PE firm to be specialized within the portfolio companies' industry with an ICA above one (ICA>1) as has been previously done by (Cressy et al., 2007). By this definition, we find a match between a PE firm and portfolio company based on industry classification for 87 transactions in our sample.

$\geq 1 = (C_{ij} / C_{.j}) \geq (C_{i.} / C_{..})$ indicates that the PE firm is relatively specialized in industry j.
$\leq 1 = (C_{ij} / C_{.j}) \leq (C_{i.} / C_{..})$ vice versa, the PE firm is relatively unspecialized in industry j.

Furthermore, we introduce a higher threshold for specialization to see the effect of a higher degree of specialization. This variable assumes the PE firm to be specialized within the portfolio company's industry when the ICA is above two (ICA>2). In this case, we find the

acquiring PE firm to be specialized within the portfolio company's industry for 53 transactions in our sample.

$\geq 2 = (C_{ij} / C_{.j}) \geq (C_{i.} / C_{..})$ indicates that the PE firm is highly specialized in industry j.

$\leq 2 = (C_{ij} / C_{.j}) \leq (C_{i.} / C_{..})$ vice versa, the PE firm is highly unspecialized in industry j.

4.3.3. Independent Variable: Dummy Geographic Region Specialized_Match

To test the match between geographic region specialization of the PE firm and the geographic region of the portfolio company, we have created a dummy in the same manner as the industry specialization match dummy. We considered using the Herfindahl-Hirschmann-index (HHI), previously adopted by Lossen (2007b), since the HHI is suitable to measure the geographic concentration within the portfolio of the PE firm (Rhoades, 1993). However, to be consistent with the methodology adopted in this paper, the ICA is used to assess the geographic specialization of the PE firm. The choice between ICA and HHI will not influence the results presented in this paper as both methods can be used to assess the concentration within an investment portfolio (Cressy et al., 2007; Lossen, 2007b)

The first variable classifies the PE firm as specialized within the portfolio company's geographic region with an ICA above one (ICA>1). By this definition, we find a match between a PE firm and portfolio company based on geographic region classification for 89 transactions in our sample.

$\geq 1 = (C_{ij} / C_{.j}) \geq (C_{i.} / C_{..})$ indicates that the PE firm is relatively specialized in region j.

$\leq 1 = (C_{ij} / C_{.j}) \leq (C_{i.} / C_{..})$ vice versa, the PE firm is relatively unspecialized in region j.

Furthermore, we introduce a higher threshold for specialization to see the effect of a higher degree of specialization due to a large number of classifications for ICA>1. This variable assumes the PE firm to be specialized within the portfolio company's geographic region when the ICA is above 2 (ICA>2). With this definition, we find the acquiring PE firm to be specialized within the portfolio company's geographic region for 35 transactions in our sample.

$\geq 2 = (C_{ij} / C_{.j}) \geq (C_{i.} / C_{..})$ indicates that the PE firm is relatively specialized in region j.

$\leq 2 = (C_{ij} / C_{.j}) \leq (C_{i.} / C_{..})$ vice versa, the PE firm is relatively unspecialized in region j.

4.3.4. Control Variables

Operating profitability and turnover during the year of the buyout are included as control variables. The turnover in our regression is expressed in relative terms, taking the log of turnover in the year of the SBO. Moreover, in order to isolate the effect of specialization, the following four control variables are included in the regression that could otherwise bias the result.

The use of EBIT in the explanatory variable operating profitability will remove the effects of financial engineering (Cressy et al., 2007). However, the effects of leverage may still affect the managers in the portfolio company as a governance mechanism which may provide operating improvements unrelated to specialization (Jensen, 1986). Therefore, the debt to equity ratio (gearing) of the portfolio company is included to mitigate the disciplinary effects of leverage.

Furthermore, the Morgan Stanley Capital Index (MSCI) which correlates with the volume of equity funds in the market is included as a control variable to mitigate the influence of the portfolio company's growth and profitability improvements (Cressy et al., 2007). According to Armour and Cumming (2006), the equity price index variable functions as a control for the condition of the stock market. Since we focus on SBOs performed in the UK, the MSCI UK return during the buyout year is included as a control variable.

The size of the PE firm is associated with economies of scale which could influence the performance of the portfolio company (Cressy et al., 2007). As a consequence, we include the total number of investments performed by the PE firm as a proxy for size.

Young portfolio companies grow faster, but are more likely to fail (Cressy, 2006). We include company age as a control variable to mitigate the performance effects related to the age of the portfolio company.

4.4. Validity & Reliability

4.4.1. Internal Validity

Internal validity is about whether we are measuring what we think we measure (Jacobsen et al., 2000). Hence, the extent to which causality between the post-SBO economic performance of the portfolio company and the investment strategy of the PE firm can be determined. The concepts and definitions used in this paper are adopted in previous research as measures for economic performance and concentration in an investment portfolio (Cressy et al., 2007). The data obtained to construct the variables for economic performance is collected from well-known databases such as Capital IQ, Zephyr, and Orbis. The data is retrieved from audited annual reports which we consider to ensure high validity.

Operating profitability defined as EBIT/Assets or EBITDA/Assets is widely adopted as a measurement of economic performance (Acharya et al., 2009; Achleitner & Figge, 2014;; Bonini, 2015; Cressy et al., 2007; Freelink & Volosovych, 2012; Hammer et al., 2015; Nikoskelainen & Wright, 2007; Wang, 2012; Zhou et al., 2014). Turnover growth has also been adopted as a measurement of the economic performance of a portfolio company in previous studies (Cressy et al., 2007; Degeorge et al., 2016; Nikoskelainen & Wright, 2007; Zhou et al., 2014). Turnover growth is arguably not a clean measure of improved operating performance as some companies may pursue unprofitable growth in turnover for various reasons (Goedhart et al., 2015). However, as most previous research on the PE industry, we lack access to necessary data to make a distinction between profitable and unprofitable turnover growth.

The ICA variable used to classify the PE firms as specialized or non-specialized in this paper follows the methodology laid out by (Cressy et al., 2007). Other studies have used the HHI, which is a similar measure of the concentration in an investment portfolio (Arcot et al., 2015; Degeorge et al., 2016). The ICA is based on the number of direct investments the PE firms have conducted over the period 2007-2015. This measure neglects the possibility that some PE firms make many small investments rather than a few large. The PE industry is to some extent exempted from public disclosure requirements, and the PE firms are known to have complex business structures (Kaplan & Schoar, 2005). This could lead to a bias in the ICA variable if the past investment history of the PE firm is not accurately captured by the direct investments as recorded in the database Capital IQ. Moreover, we rely on the industry and regional

classification presented in Capital IQ. If the classification in Capital IQ does not represent the true characteristics of the portfolio company, this could potentially bias the ICA match variable since the characteristics of the portfolio company has to correspond to the concentration of investments in that particular region or industry made by the PE firm. Like many studies in this area, we lack the data and time to address this potential bias and as a consequence, the validity is considered lower for the ICA variable.

4.4.2. External Validity

The external validity relates to the degree in which the results can be generalized and applied in other contexts (Jacobsen et al., 2002). The central question is whether the sample is an appropriate estimate of the population. In the selection process, 318 observations are excluded from the sample due to the lack of available data for all relevant variables. This implies a potential bias in our sample towards larger deals and portfolio companies, since information is more easily accessible for larger deals and companies. However, this bias is difficult to avoid and present in most previous research (De Clercq & Dimov, 2008; Kaplan & Schoar, 2005; Kaplan and Strömberg, 2009; Wang, 2012; Zhou et al., 2014). Furthermore, our sample only consists of portfolio companies which are regionally located in the UK. This could negatively influence the generalizability of our study. However, we argue that since the UK is the second most active buyout market the world after the US the results can be generalized for other geographic regions.

As presented in Appendix B, previous research across geographic regions, markets and time periods indicate that the results are generalizable for the PE industry. Cressy et al. (2007) found that PE firm specialization enhances post-PBO operating profitability for UK portfolio companies during the period 1995-2002. De Clercq and Dimov (2008); Gompers et al. (2009) examined the performance of portfolio companies acquired by specialized and diversified VC firms during the periods 1962-2002 and 1975-2003 respectively. They concluded that portfolio companies taken over by specialized VC firms exhibit performance improvements compared to portfolio companies acquired by diversified VC firms. In a broader definition of operating performance, specialization of the buyer seems to be beneficial for the portfolio company. Hammer et al. (2015) investigated differences in default probabilities for portfolio companies in a global setting during the period 1997-2010, when taken over by a specialized or diversified PE firm. They found that the probability of default is significantly lower for portfolio

companies acquired by a specialized PE firm. We argue that the results in our paper complement the above-described studies. In addition, we have supporting evidence proving that specialization benefits are generalizable to other markets. The above findings are in line with the best-owner concept, which states that the characteristics of the owner will influence the performance of the portfolio company (Goedhart et al., 2015).

4.4.3. Reliability

Reliability relates to the extent to which results are replicable and can be repeated (Jacobsen et al., 2000). To ensure reliability the process of this research paper thoroughly documented in the methodology chapter. Data has been systematically retrieved from well-known and reliable databases such as Capital IQ, Zephyr and Orbis. The investment strategy of the PE firm has been classified in a systematic manner using techniques based on previous research (Cressy et al., 2007).

5. RESULTS & ANALYSIS

In the methodology chapter, we elaborated on the sample setting, data collection process, the choice and construction relevant variables. Moreover, we discussed the reliability and validity of our study. In the following chapter, we present the results and analysis related to our research question. We discuss the descriptive statistics and the regression output to confirm or reject our hypotheses.

5.1. Descriptive Statistics

Our data set consists of 115 SBOs conducted during the period 2007-2012. The number of transactions vary per year, as exhibited in Table I. The highest number of SBO transactions in one year (35) is conducted in 2007 compared to only five transactions in 2009. A possible explanation could be the equity market conditions, as discussed in previous studies (Cressy et al., 2007; Jenkinson and Sousa, 2015; Wang, 2012). To examine the impact of market conditions on the number of SBO transactions, the MSCI annual index returns of the UK stock market are presented in Table II, including one year (2006) prior to our selected sample period.

Table I
Number of SBOs over Time

Table I displays the dispersion of performed SBOs in yearly frequency during the time window of our sample: 2007-2012.

Year	Number of SBOs	% of Total Deals
2007	35	30.0%
2008	17	15.0%
2009	5	4.0%
2010	19	17.0%
2011	30	26.0%
2012	9	8.0%
Total	**115**	**100%**

We observe a trend in the sample when examining the relation between the number of SBO transactions per year and the MSCI UK returns, as presented in Table II. The number of SBOs

increases in the years following strong positive returns, while the number of SBOs decreases in the years following negative returns in the MSCI UK. For example; in 2008, the MSCI index realized a return of -28.48%. In the following year, 2009, we retrieved data of only five SBOs. This pattern suggests a positive relationship between the MSCI UK returns and the number of SBOs in the subsequent year. Hammer et al. (2015) found that the majority of buyouts in their sample occurred during the period (2003-2007) with hot equity market conditions. The number of transactions declined during the financial crisis and gained momentum again post-crisis. These findings indicate that PE firms react to market conditions as stated by previous research (Jenkinson & Sousa, 2015; Wang, 2012). Cressy et al. (2007) found that the MSCI UK index correlates with the availability of equity funds for buyout activities. Besides, the state of the market during the initial year of the buyout is a factor influencing post-SBO profitability and growth (Cressy et al., 2007).

Table II
MSCI UK 2006-2012

Table II displays the Morgan Stanley Capital Index of the United Kingdom in British Pound (GBP). This control variable is used to assess the impact of market conditions during the buyout year. The annual performance of year 2006 is included to analyze a potential trend.

Year	MSCI UK	Number of SBOs
2006	*14.56%*	-
2007	6.54%	35
2008	-28.48%	17
2009	27.59%	5
2010	12.17%	19
2011	-1.84%	30
2012	10.19%	9

Table III reports the debt-to-equity ratio of the portfolio company in the buyout year (Gearing_0). The sample size is reduced from 115 to 89 observations due to missing data for 26 observations. The mean of gearing in the buyout year, containing 89 observations, is 111.44%. However, the mean fluctuates widely across the years of our data set. The average initial gearing of the portfolio company follows a similar pattern as between the number of

SBOs and the MSCI UK as described above. When the UK stock market realizes strong positive returns, the average gearing of the portfolio company performed in the subsequent year is higher. According to Freelink and Volosovych (2012), the number of SBO transactions depend on the liquidity in debt markets. Previous studies (Axelson et al., 2007; Jenkinson & Sousa, 2015; Wang, 2012) found that the market conditions strongly affect the capital structure in buyouts. In addition, previous research indicates that SBOs are more leveraged than PBOs (Achleitner & Figge, 2014; Hammer et al., 2015). Achleitner and Figge (2014) found that SBOs are 28% to 30% more leveraged than PBOs. When PE firms are able to increase the financial risk of the SBO by exploiting favorable debt market conditions, SBOs are an attractive investment opportunity. De Simon (2012) found the debt market is in general favorable when the overall macroeconomic conditions are good. Debt market conditions were attractive during the period 2005 to 2007, covering 20% of the total buyouts in the last decade (Harbula, 2011). In 2007/2008, conditions worsened due the drying-up debt markets (Sommer, 2012). The financial crisis put constraints on leverage ratios, affecting the number of buyouts post-crisis. Given these findings, we believe our sample set of 89 transactions during the period 2007 to 2012 is a good representation. Practitioners found similar trends as observed in our data set (Bonini, 2015; Freelink & Volosovych, 2012; Harbula, 2011; Sommer, 2012).

Table III
Gearing_0 2007-2012

Table III displays the dispersion of SBOs performed annually over the sample period. The control variable Gearing_0 measures the portfolio company's leverage position during the buyout year.

Year	Gearing_0	Observations
2007	184.80	28
2008	104.77	13
2009	6.86	4
2010	119.28	13
2011	65.72	23
2012	36.52	8
Mean	**111.44**	**89**

Table IV
Summary Statistics

Table IV presents the summary statistics of our sample containing 115 SBOs of a UK-based portfolio company from 2007 to 2014. The variables below are measured using the 115 observations (N=115) except gearing_0. Due to missing data, gearing_0 is based on 89 observations (N=89). For a detailed description of the variables, refer to Appendix A.

Variable Name	Mean	Median	Std. Dev.
Dependent Variables			
Operating Profitability	7.35	9.13	17.52
Turnover Growth	12.34	7.66	32.81
Independent Variables			
Industry_Specialized_Match_1	0.76	1.00	0.43
Industry_Specialized_Match_2	0.46	0.00	0.50
Geography_Specialized_Match_1	0.77	1.00	0.42
Geography_Specialized_Match_2	0.30	0.00	0.46
Control Variables			
Profitability_0	10.36	9.53	21.14
Turnover_0	10.28	10.30	1.33
MSCI UK	1.31	6.54	14.13
PE_Investments	67.71	112.02	20.30
Gearing_0	111.44	39.20	177.33
Company Age	20.24	15.00	20.30

Table IV reports the summary statistics for the complete sample. Profitability_0 is the operating profitability in the buyout year while the dependent variable operating profitability measures the three-year average post-SBO. When comparing initial and post-SBO operating profitability, we find that the mean of Profitability_0 (10.36) is higher than the mean of the post-SBO operating profitability (7.35). An explanation is that 6 observations for

Profitability_0 are the outliers in our data set. The inclusion of outliers is related to diagnostic testing to analyze the robustness of our data set (Brooks, 2014). We examine diagnostics in part 5.4. We believe that the outliers contain valuable information and include them in our sample. The standard deviation of post-SBO profitability (17.52) is lower than Profitability_0 (21.14). This observation implies that the effect of outliers is reduced, due to a lower spread of post-SBO operating profitability. Furthermore, the control variable MSCI UK has a low mean and high standard deviation due to the volatility of the markets during the period 2007 to 2012, see Table II. The mean of the portfolio company's age in our sample (20 years) is comparable to the study performed by Jenkinson and Sousa (2015), reporting a mean of 25 years. However, the age of the portfolio company in their paper is determined at the exit of the SBO. Kaplan and Strömberg (2009) found that the PE firm holds a portfolio company on average for three to five years in their portfolio, giving us a rough indication of the mean company age at the beginning of the SBO in their sample (21 years).

5.1.1. Correlation Matrix

Appendix C presents the correlation matrix of our sample. We find moderate correlations between the variables, indicating absence of multicollinearity in our data set (Brooks, 2014). In line with (Cressy et al., 2007), we find that Profitability_0 is positively correlated at a 5% significance level with Turnover_0. This observation supports the concept of economies of scale as portfolio companies with higher turnover are associated with improved operating profit margins. A company exploits economies of scale if a marginal increase in input leads to a proportional increase in the output of goods and services, resulting in enhanced profit margins (Panzar & Willig, 1977). However, this finding cannot be determined within the framework of our paper. In contrast to Cressy et al. (2007), we find a positive correlation, significant at a 5% level, between the turnover in the base year and the number of investments by the PE firm. This finding points out that large PE firms, measured by the number of investments over the period 2007-2015, typically invest in larger portfolio companies, measured as turnover size in the base year. Our finding is supported by the claim that large and reputable PE firms have a greater ability to raise capital (Arcot et al., 2015; Bonini, 2015; Kaplan & Schoar, 2005). Refer to Appendix F for a more detailed description of PE firm value drivers. In contrast to Cressy et al. (2007), we find that the size of the PE firm is positively correlated with the gearing ratio of the portfolio companies, significant at the 10% level. This finding is supported by the claim that large and reputable PE firms have a greater ability to raise debt capital at more favorable terms (Demiroglu & James, 2007; Ivashina & Kovner, 2011), see Appendix F for further

discussion. Furthermore, we find a negative correlation between the number of investments made by the PE firm and the specialization variables both on geographic region and industry. This evidence, supported by Cressy et al. (2007), suggests that large PE firms are less likely to implement a specialized investment strategy in comparison to smaller PE firms. In line with (The Economist, 2014b), this finding supports the notion that large PE firms are diversifying.

5.2. Bivariate Comparisons

In line with previous research, we conduct an ANOVA-test in order to assess differences between specialized and diversified PE firms in the means of operating profitability and turnover growth of the portfolio company (Cressy et al., 2007). The results of industry and geographic specialization are presented in Table V (operating profitability) and Table VI (turnover growth).

Table V
Operating Profitability & Specialized_Match

Table V presents a simple ANOVA-test to assess whether there is a significant difference in means when classifying the dependent variable operating profitability. For a description of the variables, refer to Appendix A. The F-statistic denotes the significance as follows; * significance at 10% level; ** significance at 5% level; ***significance at 1% level.

	Ind_Match_1		Ind_Match_2		Geo_Match_1		Geo_Match_2		Overall
Dummy	0	1	0	1	0	1	0	1	-
O.P. Mean	4.50	8.27	3.96	11.32	3.73	8.41	5.28	12.09	7.35
Std. Dev.	21.62	16.02	20.95	11.34	10.87	18.95	18.20	15.07	17.52
No. of Obs.	28	87	62	53	29	89	80	35	115
F-stats	0.98		5.23**		1.44		3.76*		-

The ANOVA output exhibits a difference in means of post-SBO operating profitability between the groups based on the independent variable Industry_Specialization_Match_1, respectively 4.50% and 8.27%. However, this result is not statistically significant. We find statistically significant results at a 5% level when increasing the degree of specialization to ICA>2 using Industry_Specialization_Match_2. The post-SBO operating profitability is

11.32% for the group SBO transactions performed by a specialized PE firm, whereas the mean of an SBO performed by a PE firm implementing a diversified investment strategy is only 3.73%. These findings are consistent with hypothesis 1a: The post-SBO operating performance of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on industry. We observe no statistically significant result of a difference in means when the SBO is performed by a PE firm specializing in a geographic region and matching the portfolio company. When increasing the degree of geographic specialization by the PE firm, we find significance at the 10% level. The difference in means is 12.09% for specialized PE firms and 5.28% for diversified PE firms. This indicates that the post-SBO operating performance of the portfolio company could be enhanced when focusing on geographic specialization, consistent with hypothesis 2a.

Table VI
Turnover Growth & Specialized_Match

Table VI presents a simple ANOVA-test to assess whether there is a significant difference in means when classifying the dependent variable. For a description of the variables, refer to Appendix A. The F-statistic denotes the significance as follows: * significance at 10% level; ** significance at 5% level; ***significance at 1% level.

	Ind_Match_1		Ind_Match_2		Geo_Match_1		Geo_Match_2		Overall
Dummy	0	1	0	1	0	1	0	1	-
T.G. Mean	23.05	8.89	14.97	9.26	20.44	9.97	12.16	12.75	12.34
Std. Dev.	58.58	17.33	42.16	16.04	57.92	20.41	36.37	23.17	32.81
No. of Obs.	28	87	62	53	29	89	80	35	115
F-stats	4.05**		0.86		0.06		0.01		-

Table VI presents the analysis of means when classifying the dependent variable turnover growth with regards to the variables indicating specialization. We observe a significant difference in the means for the Industry_Specialization_Match_1 variable. A diversified PE firm has a post-SBO turnover growth for the portfolio company of 23.05%, whereas a specialized PE firm only yields a post-SBO turnover growth of 8.89%. This initial finding is in contrast to our hypothesis that specialization enhances the turnover growth of the portfolio company post-SBO. However, the result could be heavily influenced by outliers present in our

sample. For the other variables, testing specialization, we do not find statistically significant differences in the mean of operating profitability and turnover growth between groups for turnover growth. Based on these findings, we cannot confirm hypotheses 2a and 2b.

The bivariate comparisons are the first tests indicating that PE firms implementing an industry specialized investment strategy might enhance the post-SBO performance of the portfolio company, even though not all results are statistically significant. To be able to draw a conclusion regarding our hypothesis, we proceed with a more extensive analysis. The following part elaborates on the model used to conduct this research. In addition, diagnostic tests are performed to assess if our data set is applicable.

5.3. Ordinary Least Squares Regression

The Ordinary Least Squares (OLS) regression is the most common quantitative model. The mechanism is as follows; the regression approximates coefficients for the independent variables and the intercept to minimize the difference between the observations in the data set and predicted responses (Brooks, 2014). Our choice for the application of the OLS regression is justified by previous research conducted in assessing post-buyout performance (Achleitner & Figge, 2014; Cressy et al., 2007; Lossen, 2007a). The formula is given in the equation below:

$$y = \beta_0 + \sum_{k=1}^{K} \beta_k * x_k + u \tag{4}$$

β_0 = constant
β_k = parameter of independent variable x_k
x_k = independent variables (see Appendix A for a list of the variables).
u = error term

Five assumptions are required to hold in order for the OLS regression to deliver efficient and unbiased results. These five assumptions are discussed at length by Brooks (2014);

Assumption 1: $E(u_t) = 0$

Assumption 2: $var(u_t) = \sigma^2 < \infty$

Assumption 3: $cov(u_i, u_j) = 0 \; for \; i \neq j$

Assumption 4: $the \; x_t \; are \; non - stochastic$

Assumption 5: the disturbances are normally distributed

In the following part, we will determine whether the assumptions underlying the OLS hold.

5.4. Diagnostic Tests

The first OLS-assumption requires the average value of error terms to be zero (Brooks, 2014). By introducing a constant term in all regressions, this assumption is not violated.

The second OLS-assumption requires the variance of the error terms to be constant (Brooks, 2014). The White's test is used to test for heteroscedasticity in the regressions. We find significant heteroscedasticity for 10 of the 16 main regressions as presented in Appendix D. The coefficients will be unbiased in the presence of heteroscedasticity, however, the OLS estimators will be inefficient and no longer be the best linear unbiased estimators. As suggested by (Brooks, 2014), we use White's heteroscedasticity-consistent standard error estimates for the regressions that suffer from heteroscedasticity. This approach is also used by Cressy et al. (2007), to mitigate the consequences of heteroscedasticity in the regressions. White's standard errors will increase the standard errors for the slope coefficients relative to the original OLS regression (Brooks, 2014). This leads to more conservative hypothesis testing as more evidence is required to reject the null hypothesis.

The third OLS-assumption requires the covariance between the error terms in the cross-sectional data to be zero (Brooks, 2014). We find that the error terms are uncorrelated in all the regressions as exhibited in Appendix D.

The fourth OLS-assumption requires uncorrelated error terms in relation to the explanatory variable (Brooks, 2014). If the error terms are correlated with the explanatory variable, the regression could suffer from endogeneity which potentially causes biased and inconsistent estimates. This problem could occur if e.g. specialized PE firms are better at picking portfolio companies with more improvement potential than non-specialized PE firms. Compared to papers in this field of study, we lack suitable instruments to address the potential endogeneity problems and for this reason, the causality between investment strategy and post-SBO economic performance of the portfolio company cannot fully be determined. In order to minimize the likelihood of endogeneity in our regression, the methodology and variable construction is based on previous research (Cressy et al., 2007).

The fifth OLS-assumption requires the error terms in the regressions to be normally distributed (Brooks, 2014). The Jarque-Bera test is used to test for non-normality in the error terms. The error terms in our regressions are not normally distributed as presented in Appendix C. Non-

normality in the error terms will not have any consequence on the coefficient estimates if the sample size is sufficiently large and the other OLS-assumptions hold (Brooks, 2014). The non-normality in the error terms gives us two options; either outliers[1] are excluded to ensure that error terms are normally distributed or the non-normality of the error terms is ignored due to the central limit theorem, which states that the mean of a sufficiently large sample will be approximately normally distributed. Our model does not suffer from non-normality when excluding the outliers. We believe that our sample size is sufficient to ignore the non-normality in our sample and thereby include the outliers as they contain valuable information. To ensure that outliers had no significant impact, we ran the regressions presented in chapter 5 excluding the outliers and found little difference. Moreover, we find no indication of multicollinearity as demonstrated by the low correlations between the independent variables in the correlation matrix displayed in Appendix C.

Based on the diagnostic tests and the correlation matrix, we can confirm that the coefficient estimates used to test the hypotheses are a good representation of our sample when appealing to the central limit theorem in the case of non-normality in the error terms and including White's heteroscedasticity-consistent standard errors in the presence of heteroscedasticity. In the following sections, we present and analyze the regressions to test our hypotheses.

5.5. Hypothesis 1: Industry Specialization

We perform four OLS regressions, with and without gearing, to analyze the effects of a PE firm's specialized investment strategy on post-SBO operating profitability and turnover growth of the portfolio company. Due to an incomplete data set, the sample size decreases from 115 to 89 observations when including the control variable gearing_0. The exclusion of the 26 observations with missing gearing observations can alter our data output. However, gearing during the buyout year might play a relevant role in determining the initial performance of the company (Cressy et al., 2007). This procedure is adopted in all the following regressions to ensure consistency in our analysis.

5.5.1. Operating Profitability as Dependent Variable

The results are presented in Table VII for the first two regressions. In regression one, Industry_Specialized_Match_1 is included as the main independent variable along with the

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[1] Outliers are defined as observations of post-SBO turnover growth or operating profitability +/- two Std. Dev. from its mean.

control variables, described in detail in Appendix A. The goodness-of-fit of the model, R^2 (0.515), measures how well the regression is explained by our explanatory variables (Brooks, 2014). However, it is necessary to analyze the adjusted R^2 to determine the explanatory power of the variables included. A high adjusted R^2 (0.492), as exhibited in Table VII, indicates a strong fit and low variance (Brooks, 2014). When including the control variable gearing both our R^2 (0.554) and adjusted R^2 (0.521) increase, improving the fit of our model. This finding indicates that gearing plays a role in the post-SBO operating profitability, as suggested by Cressy et al. (2007). However, due to the insignificance of gearing_0, the effect of leverage cannot be fully determined.

Industry_Specialized_Match_1, the independent variable, is significant at a 10% level in the OLS excluding Gearing_0 (5.675), whereas it is significant at a 5% level in the OLS with gearing (4.766). When including Gearing_0, the coefficient of Industry_Specialized_Match_1 is lower, but the level of significance is higher. The higher significance level and improved fit of the regression can be explained by the lower standard deviation found in the sample with 89 observations (11.69) compared to the sample with 115 observations (17.52). In addition, the independent variable Gearing_0 adds explanatory power to the regression. In line with Cressy et al. (2007), we find that the control variable Profitability_0 is significant at 1% level, indicating that operating profitability in the buyout year has an influence on the post-SBO operating profitability. The positive coefficient indicates that portfolio companies with higher initial operating profitability are able to improve their margins more than firms with low initial operating profitability.

In the second regression, presented in Table VII, Industry_Specialized_Match_1 is replaced with Industry_Specialized_Match_2. This independent variable has a higher threshold for classifying the PE firm as specialized. Industry_Specialized_Match_2 requires the ICA>2 while the requirement for Industry_Specialized_Match_1 is an ICA>1. The inclusion of Industry_Specialized_Match_2 improves the explanatory power in terms of R^2 (0.543) and adjusted R^2 (0.522). The stricter classification reduces the variance in the sample for both specialized (11.34 compared 16.02) and diversified (20.95 compared 21.62) PE firms and thereby improve the fit of the model. In line with regression 1, we find that Gearing_0 enhances the fit of the model both in terms of R^2 (0.578) and adjusted R^2 (0.547).

Table VII
Operating Profitability & Industry Specialization

Table VII presents the regression output for Industry_Specialized_Match_1 and Industry_Specialized_Match_2 on the operating profitability 3 years post-SBO. For a description of the variables, refer to Appendix A. The coefficients and standards errors are given. We use White's heteroscedasticity-consistent standard errors. The significance level is denoted as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Variable	Regression 1		Regression 2	
	OLS O. Profitability without gearing	OLS O. Profitability with gearing	OLS O. Profitability without gearing	OLS O. Profitability with gearing
Intercept	-3.466	3.630	-2.549	4.230
	(4.655)	(3.302)	(3.488)	(2.898)
Industry_Specialized_Match_1	5.675*	4.766**	-	-
	(3.176)	(1.886)		
Industry_Specialized_Match_2	-	-	7.715***	5.649***
			(2.432)	(1.798)
Profitability_0	0.578***	0.412***	0.574***	0.408***
	(0.118)	(0.090)	(0.114)	(0.082)
MSCI UK	0.101	0.074	0.086	0.084
	(0.117)	(0.102)	(0.106)	(0.092)
PE_Investments	0.004	0.006	0.007	0.008
	(0.009)	(0.005)	(0.009)	(0.006)
Gearing_0	-	-0.004	-	-0.004
		(0.004)		(0.004)
Company Age	0.008	-0.076	-0.008	-0.070
	(0.056)	(0.052)	(0.054)	(0.053)
R^2	0.515	0.554	0.543	0.578
Adjusted R^2	0.492	0.521	0.522	0.547
No. of Observations	115	89	115	89
F-statistic	23.161	16.983	25.903	18.682
Probability (F-statistic)	0.00	0.00	0.000	0.000

The results are in line with regression 1 but with stronger significance levels and higher coefficients. We find positive coefficients at the 1% significance level, both without (7.715) and with Gearing_0 (5.649). Including the control variable Gearing_0 lowers the coefficient of Industry_Specialized_Match_2 but improves the fit of our model. The control variable Profitability_0 remains significant at the 1% level and the coefficients are virtually unchanged.

The positive and statistically significant coefficients of Industry_Specialized_Match_1 and Industry_Specialized_Match_2 provide strong support, hence confirming hypothesis 1a. The hypothesis states that industry specialization of the PE firm has a positive effect on the post-SBO operating performance of the portfolio company. In addition, the consistency in the coefficient estimates between the two regressions implies that our findings are robust.

5.5.2. Turnover Growth as Dependent Variable

In the following two regressions, 3 and 4, hypothesis 1b is tested using the post-SBO geometric turnover growth as the dependent variable. The results are presented in Table VIII. In all the regressions we find the R^2 and the adjusted R^2 to be low, which implies that the overall explanatory power of the model is low (Brooks, 2014). In addition, the highly significant intercept infers that variables that can explain the dependent variable are omitted (Brooks, 2014). This indicates that the combination of independent variables is not sufficient to explain the post-SBO turnover growth. For regression 3, the R^2 (0.11) and the adjusted R^2 (0.07) increases when the control variable Gearing_0 is included (0.16 and 0.09 respectively). The low R^2 (0.09) and adjusted R^2 (0.05) in regression 4, again increases with Gearing_0 (0.15 and 0.09 respectively).

In contrast to Cressy et al. (2007), the coefficients for the industry specialization variables are consistently negative in the regressions. In regression 3, the coefficient is lower for Industry_Specialized_Match_1 without gearing (-10.28) in comparison to with gearing (-5.48). In regression 4, the coefficient for Industry_Specialized_Match_2 without gearing (-3.64) is lower than with gearing (-1.78). However, in line with Cressy et al. (2007), we find no statistically significant results any of the regressions. This indicates that industry specialization of the PE firm is not an important determinant of post-SBO turnover growth of the portfolio company.

Table VIII
Turnover Growth & Industry Specialization

Table VIII presents the regression output for Industry_Specialized_Match_1 and Industry_Specialized_Match_2 on the geometric mean of turnover growth three years post-SBO. For a description of the variables, refer to Appendix A. The coefficients and the standard errors are included. Due to the absence of heteroscedasticity, we do not include White's heteroscedasticity-consistent standard errors. The significance level is denoted as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Variable	Regression 3		Regression 4	
	OLS Turnover Growth without gearing	OLS Turnover Growth with gearing	OLS Turnover Growth without gearing	OLS Turnover Growth with gearing
Intercept	88.170***	74.927***	86.786***	75.886***
	(23.360)	(20.090)	(23.520)	(20.238)
Industry_Specialized_Match_1	-10.283	-5.480	-	-
	(7.284)	(5.859)		
Industry_Specialized_Match_2	-	-	-3.643	-1.784
			(6.151)	(5.101)
Turnover_0	-6.500***	-5.506***	-7.052***	-5.929***
	(2.350)	(2.005)	(2.327)	(1.955)
MSCI UK	0.084	0.091	0.133	0.109
	(0.219)	(0.185)	(0.218)	(0.186)
PE_Investments	0.011	0.020	0.017	0.023
	(0.027)	(0.026)	(0.028)	(0.026)
Gearing_0	-	0.003	-	0.003
		(0.014)		(0.014)
Company Age	-0.104	-0.156	-0.079	-0.151
	(0.153)	(0.127)	(0.153)	(0.126)
R^2	0.112	0.161	0.098	0.154
Adjusted R^2	0.071	0.099	0.057	0.092
No. of Observations	115	89	115	89
F-statistic	2.741	2.629	2.377	2.481
Probability (F-statistic)	0.023	0.022	0.043	0.030

According to Degeorge et al. (2016), PE firms can have a strategic focus to either grow sales or improve margins. This would suggest that some PE firms have the objective to increase turnover growth while others focus on improving margins. Our classification of the PE firm as specialized or diversified does not incorporate the difference in strategic focus, as performed by Degeorge et al. (2016). This would implicate that the regression is not valid. Moreover, the low R^2 and adjusted R^2 indicate that other factors, not present in our sample and model, determine turnover growth.

Moreover, we find no statistically significant coefficients for the control variables except for turnover in the buyout year. In line with Cressy et al. (2007), we find that the level of turnover in the buyout year has a negative coefficient. In regression 3, the coefficient is lower when excluding gearing (-6.5) compared to when gearing is included (-5.5). In regression 4, the results are -7.05 and -5.92 respectively. In contrast to Cressy et al. (2007), we use the log of turnover in the buyout year, hence, the results are not directly comparable. However, due to the low fit of the model and large, statistically significant intercept, we suspect regression 3 and 4 are not completely reliable. Cressy et al. (2007) examined the effect of specialization on turnover growth post-LBO and found similar results. The F-ratios testing specialization on turnover growth is insignificant at 10% level, compared to our findings (5% level). Hence, we are unable to confirm that the post-SBO operating performance in terms of revenue growth of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on industry, rejecting hypothesis 1b.

5.6. Hypothesis 2: Geographic Specialization

To analyze the effects of a PE firm's specialized investment strategy on post-SBO operating profitability and turnover growth, we four OLS regression. As in 5.5 Hypothesis 1, the sample size is decreased from 115 to 89 observations due to an incomplete data set when including the control variable Gearing_0. In the following regressions, we analyze the impact of a specialized investment strategy by the PE firm based on geographic region.

5.6.1. Operating Profitability as Dependent Variable

In the first two regressions, presented in Table IX, Geography_Specialized_Match_1 is included as the main independent variable along with the control variables, as shown in Appendix A. In regression 5, we find that the R^2 (0.506) and adjusted R^2 (0.483) increases with Gearing_0 included (0.546 and 0.513 respectively). We observed the same pattern in regression

6, where the R^2 (0.508) and adjusted R^2 (0.485) increases with gearing (0.524 and 0.489 respectively). With high R^2 and adjusted R^2, we conclude that the explanatory power of the model is good.

We find insignificant positive coefficients for the specialization variable in all the regressions except regression 6 without Gearing_0, as shown in Table IX. The coefficient for Geography_Specialized_M_1 is 4.552 with Gearing_0 and 4.101 without. For Geography_Specialized_M_2, with a higher degree of specialization, the coefficients are 0.327 respectively 4.037. The low coefficient of Geography_Specialized_M_2 (0.327) in regression 6 with Gearing_0 can be explained due to a small number of observations (29 out of 89) classified as a specialized PE firm and fulfilling the criterion of ICA>2. To investigate the impact of this small number of observations, we ran a regression with a less strict criterion, ICA>1.9. The result showed that the coefficient increased to a level comparable to the other regression in Table IX. The difference in results indicates that our sample is too small for such a strict criterion on geographic specialization when gearing is included.

Comparable to our first two regressions testing the effect of industry specialization on profitability, the operating profitability in the buyout year is significant at a 1% level with positive coefficients. Unsurprisingly, this finding indicates that profitability in the buyout year is a determinant of the post-SBO operating profitability. As discussed in part 5.5.1., initial profitability has influence on the post-SBO performance.

Due to the insignificance of the results, we cannot fully determine the effect post-SBO operating performance if the PE firm applies a specialized investment strategy based on geographic region. Therefore, hypothesis 2a is rejected.

Table IX
Operating Profitability & Geographic Specialization

Table IX presents the regression output for Geography_Specialized_Match_1 and Geography_Specialized_Match_2 on the 3 years post-SBO operating profitability. For a description of the variables, refer to Appendix A. The coefficients and standard errors in parentheses are given. We use White's heteroscedasticity-consistent standard errors. The significance level is denoted as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Variable	Regression 5		Regression 6	
	OLS O. Profitability without gearing	OLS O. Profitability with gearing	OLS O. Profitability without gearing	OLS O. Profitability with gearing
Intercept	-2.053	3.439	-0.134	7.350**
	(3.134)	(3.545)	(3.261)	(3.014)
Geography_Specialized_M _1	4.101	4.552	-	-
	(2.652)	(2.748)		
Geography_Specialized_M_2	-	-	4.037*	0.327
			(2.353)	(1.934)
Profitability_0	0.574***	0.397***	0.566***	0.403***
	(0.126)	(0.092)	(0.123)	(0.093)
MSCI UK	0.072	0.053	0.071	0.050
	(0.104)	(0.009)	(0.108)	(0.098)
PE_Investments	0.003	0.006	0.003	0.002
	(0.007)	(0.005)	(0.008)	(0.006)
Gearing_0	-	0.0003	-	-0.003
		(0.004)		(0.004)
Company Age	-0.001	-0.080	0.006	-0.078
	(0.053)	(0.051)	(0.052)	(0.052)
R^2	0.506	0.546	0.508	0.524
Adjusted R^2	0.483	0.513	0.485	0.489
No. of Observations	115	89	115	89
F-statistic	22.330	16.438	22.483	15.041
Probability (F-statistic)	0.000	0.000	0.000	0.000

5.6.2. Turnover Growth as Dependent Variable

Regression 7 and 8, as displayed in Table X, test the effect of geographic specialization on post-SBO turnover growth is examined. In regression 7, we find that the R^2 (0.129) and adjusted R^2 (0.089) increases with Gearing_0 included (0.17 and 0.109 respectively). The same pattern is found in regression 8, where the R^2 (0.097) and adjusted R^2 (0.056) increases with gearing (0.161 and 0.099 respectively). Observing the low R^2 and adjusted R^2, we conclude that the explanatory power of the model is not sufficient. Also, we find the intercept to be highly significant in all regressions which indicate that important explanatory variables are omitted.

The specialization variables based on geographic region is insignificant for all the regressions. Geography_Specialized_M_1 in regression 7 is insignificant for both with gearing (-8.368) and without (-15.159). While, Geography_Specialized_M_2 in regression 8 is insignificant for both with gearing (-4.808) and without (-3.018). Moreover, we do not find significance in the control variables except for Turnover_0. The coefficients are negative for all the regressions both with and without gearing. This evidence suggests that the geometric mean of turnover growth decreases with the size of the portfolio company's turnover in the buyout year.

Hypothesis 2b, stating that the post-SBO geometric turnover growth of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on geographic region, is thereby rejected.

Table X
Turnover Growth & Geographic Specialization

Table X presents the regression output for Geography_Specialized_Match_1 and Geography_Specialized_Match_2 on the geometric mean of turnover growth 3 years post-SBO. For a description of the variables, refer to Appendix A. The coefficients and the standard errors in parentheses are given. White's heteroscedasticity-consistent standard errors are not used due to the absence of heteroscedasticity. Only regression 7 without gearing includes White's heteroscedasticity-consistent standard errors. The significance level is denoted as: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Variable	Regression 7		Regression 8	
	OLS Turnover Growth without gearing	OLS Turnover Growth with gearing	OLS Turnover Growth without gearing	OLS Turnover Growth with gearing
Intercept	106.863***	87.149***	88.898***	70.764***
	(45.487)	(21.921)	(24.342)	(20.735)
Geography_Specialized_M_1	-15.159	-8.368	-	-
	(12.906)	(6.382)		
Geography_Specialized_M_2	-	-	-3.018	4.808
			(6.711)	(5.379)
Turnover_0	-7.983***	-6.387***	-7.333***	-5.751***
	(3.393)	(1.957)	(2.351)	(1.958)
MSCI UK	0.134	0.113	0.140	0.132
	(0.185)	(0.182)	(0.218)	(0.183)
PE_Investments	0.007	0.017	0.019	0.030
	(0.016)	(0.026)	(0.028)	(0.026)
Gearing_0	-	-0.003	-	0.003
		(0.016)		(0.014)
Company Age	-0.070	-0.143	-0.085	-0.131
	(0.097)	(0.124)	(0.153)	(0.127)
R^2	0.129	0.170	0.097	0.161
Adjusted R^2	0.089	0.109	0.056	0.099
No. of Observations	115	89	115	89
F-statistic	3.237	2.795	2.345	2.614
Probability (F-statistic)	0.009	0.016	0.046	0.023

5.7. Joint Regressions

In order to test the robustness of our results, we also perform joint regressions including both industry and geographic specialization. Based on the previous regressions, we can conclude that Gearing_0 in the buyout year improves the explanatory power of the model in terms of R^2 and adjusted R^2 as discussed in 5.5.1. Therefore, we present the results for the joint regressions including the control variable Gearing_0, as exhibited in Table XI. In line with Cressy et al. (2007), we find that industry specialization is statistically significant with positive coefficients in the joint regressions. This evidence confirms hypothesis 1a as discussed in part 5.5.1. Geographic specialization is only significant in one regression, when the ICA>1 for both industry and geographic specialization. Based on all regressions with geographic specialization, we cannot confirm hypothesis 1b as discussed in 5.6.1. The coefficients of the control variables of the joint regressions are roughly the same as in the individual regressions with post-SBO operating profitability as the dependent variable, see Table XII and XIII. Due to the increased significance of the industry specialization variables and the consistent results regarding the control variables, we conclude that our model is robust.

We also performed joint regressions for post-SBO turnover growth and found, consistently, insignificant results. In line with Cressy et al. (2007), this evidence implies that specialization of the PE firm is not an important determinant of post-SBO turnover growth. Hypotheses 2a and 2b are therefore once again rejected, as previously shown in 5.5.2 and 5.6.2.

To conclude our analysis, we confirm that specialization based on industry enhances the post-SBO operating profitability of the portfolio company. Specialization based on geographic region is not an important determinant of post-SBO operating profitability. We find no statistically significant evidence that specialization of the PE firm has an impact on the turnover growth for the portfolio company. The results are further discussed and compared to related studies in the following chapter.

Table XI
Operating Profitability & Joint Specialization

Table XI presents the regression output for the joint effects of specialization on post-SBO profitability. For a description of the variables, refer to Appendix A. The coefficients and the standard errors in parentheses are given. The coefficients and standards errors are given. We use White's heteroscedasticity-consistent standard errors. The significance level is denoted as: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Variable	Regression 9	Regression 10	Regression11	Regression12
Intercept	-0.498	3.705	4.593	1.159
	(3.574)	(3.281)	(2.910)	(3.438)
Industry_Specialized_M_1	4.796***	4.791***	-	-
	(1.790)	(1.952)		
Industry_Specialized_M_2	-	-	5.860***	5.262***
			(1.861)	(1.711)
Geography_Specialized_M_1	4.592*	-	-	3.687
	(2.660)			(2.531)
Geography_Specialized_M_2	-	-0.200	-1.010	-
		(1.930)	(1.870)	
Turnover_0	0.406	0.412	0.409	0.403
	(0.089)	(0.090)	(0.081)	(0.083)
MSCI UK	0.078	0.074	0.083	0.085
	(0.094)	(0.102)	(0.092)	(0.086)
PE_Investments	0.012*	0.006	0.007	0.011**
	(0.005)	(0.005)	(0.007)	(0.006)
Gearing_0	-0.001	-0.004	-0.004	-0.001
	(0.005)	(0.004)	(0.004)	(0.005)
Company Age	-0.076	-0.076	-0.071	-0.071
	(0.052)	(0.053)	(0.053)	(0.053)
R^2	0.577	0.554	0.579	0.592
Adjusted R^2	0.540	0.516	0.543	0.557
No. of Observations	89	89	89	89
F-statistic	15.769	14.383	15.915	16.782
Probability (F-statistic)	0.000	0.000	0.000	0.000

6. DISCUSSION & FURTHER IMPLICATIONS

6.1. Discussion

The aim of this study is to outline the effects of a PE firm's investment strategy on the post-SBO operating performance, in terms of operating profitability and turnover growth, of the portfolio company. We find that post-SBO operating profitability is enhanced when the PE firm specializes in the industry of the portfolio company.

As shown in Table VII, PE firms with moderate industry specialization (ICA>1) increase the post-SBO operating profitability of the portfolio company with 4.77% (at 5% significance level) in comparison to diversified PE firms. The evidence is consistent with PE firms that are highly specialized (ICA>2), in which the post-SBO operating profitability of the portfolio increases by 5.659% (at 1% significance level). These findings are consistent with Cressy et al. (2007) who found that the post-PBO operating profitability for the portfolio company increased by 8.50% (at 1% significance level) when the PE firm applied a specialized investment strategy based on industry. The difference in coefficients indicates that SBOs have less potential for operating improvements in comparison to PBOs. A potential explanation is that the previous owner captured most of the performance improvements (Jensen, 1986, 1989) and that incremental performance in the subsequent ownership was low (Bonini, 2015; Wang, 2012).

Due to the characteristics of the transactions, where both the buying and selling parties are PE firms, traditional arguments for value creation (Jensen, 1986, 1989) are not applicable since the resolution of agency problems is likely to generate a steep one off-change when acquired by the first PE firm (Wright et al., 2009). Therefore, the operating performance improvements in the portfolio company are likely to be related to the specific idiosyncratic knowledge and skill set held by the PE firm (Jensen, 1993). The evidence presented in this paper supports the notion of the best-owner concept in which the capabilities and experience of the PE firm are related to the performance of the portfolio company (Goedhart et al., 2015). The PE firm gains direct experience through multiple investments in certain industries (Cohen & Levinthal, 1990), which leads to a reduction in information asymmetry and uncertainty (Eisenhardt, 1989; Norton and Tenenbaum, 1993). PE firms that focus on markets or in industries in which they have a competitive advantage can outperform their peers (Grant, 1991). In-depth knowledge of a certain industry will enhance the PE firm's capabilities to improve the performance of

portfolio companies within that industry (Cressy et al., 2007; De Clercq & Dimov, 2008). In addition to improved operating profitability, portfolio companies acquired by a specialized PE firm exhibit lower probabilities of default (Hammer et al., 2015). This finding is not directly comparable to the post-SBO operating profitability. However, the studies are complementary in a broader definition of post-SBO performance. Research on the VC market shows other benefits of specialization (De Clercq & Dimov, 2008; Gompers et al., 2009). Portfolio companies acquired by industry specialized VC firms have a higher probability of a successful exit through an IPO compared to companies owned by diversified VC firms. These two studies, conducted in the US market, imply that the benefits of specialization can be generalized to other geographic regions and other parts of the PE industry. Furthermore, the extensive time periods used in the articles (1962-2002 and 1975-2003) indicate that this relation is consistent over time.

In line with Cressy et al. (2007), we do not find evidence that suggests specialization of the PE firm has an impact on the turnover growth of the portfolio company as shown in Table VIII. However, (Degeorge et al., 2016) found that some PE firms focus on improving margins for the portfolio company while other PE firms focus on sales growth. Insignificance in the turnover growth regressions might be subject to bias if most of the PE firms included in our sample are classified as margin growers. Creating a subsample with PE firms classified as sales growers might generate better insights whether specialization enhances the turnover growth for PE firms with a sales growth strategy (Degeorge et al., 2016).

We would expect geographic specialization to enhance the performance of the portfolio company since a specific region focus could lead to greater network ties (Lossen, 2007b) and greater abilities to improve the market position of the portfolio company in the corresponding market (Degeorge et al., 2016). However, as shown in Table IX and X, specialization based on geographic region is not an important determinant of post-SBO operating profitability or turnover growth of the portfolio company. The benefits of specialization as described above does not have a significant influence when it comes to geographic specialization.

6.2. Further Implications

Although specialized PE firms enhance the operating profitability of the portfolio company, this does not necessarily lead to a higher IRR. In fact, Lossen (2007a) found that PE firms with a specialized investment strategy exhibit lower IRRs in PBOs compared to diversified PE firms. The price a PE firm has to pay, when engaging in an SBO transaction, is crucial as it affects the return on the investment (Achleitner & Figge, 2014; Wang, 2012). Previous research found that SBOs occur at higher valuation multiples than PBOs, making these transactions on average 15% more expensive than PBOs (Achleitner & Figge, 2014; Wang, 2012). According to Wang (2012), this premium cannot be explained by the characteristics of the portfolio company. Achleitner and Figge (2014); Wang (2012) found that the buying and selling PE firm have a similar set of negotiating skills and market timing, affecting the pricing of SBOs. However, due to differences among PE firms in track record and reputation, experienced PE firms are able to use their bargaining power to enhance negotiation (Lossen, 2007b). As discussed in Appendix F, we find that PE firms who diversify across industries and geographic regions are on average larger in terms of total assets in comparison to specialized PE firms. Moreover, the potential operating improvements related to the portfolio company might already be assumed in the price, regardless of the negotiation skills of the involved parties. In our study, we lack the data to determine entry and exit multiples related to the transactions in this sample. For this reason, the real value creation related to the transactions in this sample cannot be determined. Bonini (2015) found that returns of SBOs are positive, yet significantly lower than PBOs. However, to examine the net IRR of SBOs performed by specialized PE firms, further research needs to be conducted.

Another implication for further research is the tradeoff between a specialized and diversified investment strategy, both profitable for the PE firm (GPs) and the LPs. As mentioned previously, the contractual relationship between GPs and LPs gives the LPs a large freedom to maneuver as LPs only have limited measures of control (Arcot et al., 2015; Kaplan & Strömberg, 2009; Steindl, 2013). Due to the high upfront fees, refer to Appendix F for a detailed description, the GPs have an incentive to prioritize a full deployment of committed capital rather than screening for targets with substantial value creation potential. Especially since up-front fees account for 60% of the NPV of the GP's income (Metrick & Yasuda, 2010). In our study we find that post-SBO operating profitability of the portfolio company is enhanced when PE firms apply a specialized investment strategy based on industry. This could

potentially lead to an alignment of interests between the GPs and LPs. The GPs will benefit through carried interest, as described in Appendix F. The question is whether the application of a specialized investment strategy will truly result in enhanced returns for the PE firm instead of focusing on upfront management fees. Therefore, further research is necessary to investigate the effect of a specialized investment strategy on PE firm (GPs) income. This would enable practitioners to draw a conclusion on the tradeoff between a specialized and diversified investment strategy in the best interest for both GPs and LPs.

7. CONCLUSION

This paper extends the research on potential value creation in SBOs by concentrating on the strategic focus of the PE firm related to the characteristics of the portfolio company. We investigate the following hypotheses: (1) The post-SBO operating profitability and turnover growth of the portfolio company is enhanced if the PE firm applies a specialized investment strategy based on industry or geographic region: and (2) The post-SBO turnover growth is enhanced if the PE firm applies a specialized investment strategy based on industry or geographic region. To test these hypotheses, we constructed a sample consisting 115 SBO transactions of a UK-based portfolio company during the period 2007-2012. In addition, we created two explanatory variables, dummy Industry_Specialized_Match and Geography_Specialized_Match, to classify the corresponding PE firms engaging in the SBO on their investment strategy. Including a set of control variables, to rule out external factors, we found that (1) the post-SBO operating profitability of the portfolio is enhanced when the PE firm applies a specialized investment strategy based on industry. No significant results were found for geographic region specialization. For the second hypothesis (2) we found that a specialized investment strategy has no statistically significant effects on post-SBO turnover growth.

BIBLIOGRAPHY

Acharya, V. V., Hahn, M., & Kehoe, C. (2009). *Corporate Governance and Value Creation: Evidence from Private Equity*. C.E.P.R. Discussion Papers, CEPR Discussion Papers: 7242.

Achleitner, A.-K., Bauer, O., Figge, C., & Lutz, E. (2012). *Exit of Last Resort? Empirical Evidence on the Returns and Drivers of Secondary Buyouts as Private Equity Exit Channel*.

Achleitner, A.-K., & Figge, C. (2014). Private Equity Lemons?Evidence on Value Creation in Secondary Buyouts. *European Financial Management, 20*(2), 406-433.

Achleitner, A.-K., Figge, C., & Lutz, E. (2014). Value Creation Drivers in a Secondary Buyout--The Acquisition of Brenntag by BC Partners. *Qualitative Research in Financial Markets, 6*(3), 278-301.

Archibugi, D., & Pianta, M. (1994). Aggregate convergence and sectoral specialization in innovation. *Journal of Evolutionary Economics, 4*(1), 17-33.

Arcot, S., Fluck, Z., Gaspar, J.-M., & Hege, U. (2015). Fund managers under pressure: Rationale and determinants of secondary buyouts. *Journal of Financial Economics, 115*, 102-135.

Armour, J., & Cumming, D. (2006). The legislative road to Silicon Valley. *Oxford Economic Papers*.

Axelson, U., Strömberg, P. J., & Weisbach, M. (2007). Why are Buyouts Leveraged? The Financial Structure of Private Equity Firms.

Baker, M., & Wurgler, J. (2000). The Equity Share in New Issues and Aggregate Stock Returns. *The Journal of Finance, 55*(5), 2219-2257.

Bonini, S. (2015). Secondary Buyouts: Operating Performance and Investment Determinants. *Financial Management, 44*(2), 431-470.

Bottazzi, L., Da Rin, M., & Hellmann, T. (2008). Who are the active investors?: Evidence from venture capital. *Journal of Financial Economics, 89*(3), 488-512.

De Long, J. (1990). Did JP Morgan's Men Add Value. *A Historical Perspective on Financial*.

Brav, A., Jiang, W., Partnoy, F., & Thomas, R. (2008). Hedge Fund Activism, Corporate Governance, and Firm Performance. *The Journal of Finance, 63*(4), 1729-1775.

Brooks, C. (2014). *Introductory econometrics for finance*: Cambridge university press.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128-152.

Cressy, R. (2006). Determinants of small firm survival and growth. *The Oxford handbook of entrepreneurship*, 161-193.

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*(4), 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.

De Clercq, D., & Dimov, D. (2008). Internal knowledge development and external knowledge access in venture capital investment performance. *Journal of Management Studies, 45*(3), 585-612.

De Simon, M. (2012). Private Equity: overview of European Secondary Buyouts.

Degeorge, F., Martin, J., & Phalippou, L. (2016). On secondary buyouts. *Journal of Financial Economics, 120*(1), 124-145.

Demaria, C. (2015). *Alignment of Interests of Fund Investors and Fund Managers in Private Equity.*

Demiroglu, C., & James, C. M. (2007). Lender control and the role of private equity group reputation in buyout financing.

Eisenhardt, K. M. (1989). Agency Theory: An Assessment and Review, *57.*

Freelink, S., & Volosovych, V. (2012). Do Secondary Buyouts Create Value? Evidence from the United Kingdom.

Gao, L. S. (2011). Portfolio Industry Strategy in Venture Capital Investments. *The Journal of Private Equity, 14*(2), 59.

Gejadze, M., Giot, P., & Schwienbacher, A. (2012). *Private Equity Fundraising, Fund Performance and Firm Specialization.*

Ghai, S., Kehoe, C., & Pinkus, G. (2014). Private equity: Changing perceptions and new realities. *McKinsey Quarterly.*

Gillan, S., & Starks, L. T. (1998). A survey of shareholder activism: Motivation and empirical evidence.

Goedhart, M., Koller, T., & Wessels, D. (2015). *Valuation: measuring and managing the value of companies*: John Wiley & Sons.

Gompers, P., Kovner, A., & Lerner, J. (2009). Specialization and Success: Evidence from Venture Capital. *Journal of Economics and Management Strategy, 18*(3), 817-844.

Gompers, P., Kovner, A., Lerner, J., & Scharfstein, D. (2008). Venture capital investment cycles: The impact of public markets. *Journal of Financial Economics, 87*, 1-23.

Grant, R. M. (1988). On 'dominant logic', relatedness and the link between diversity and performance. *Strategic Management Journal, 9*(6), 639-642.

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California management review, 33*(3), 114-135.

Guo, S., Hotchkiss, E. S., & Song, W. (2011). Do Buyouts (Still) Create Value?*, 479.*

Gupta, A. K., & Sapienza, H. J. (1992). Determinants of venture capital firms' preferences regarding the industry diversity and geographic scope of their investments. *Journal of Business Venturing, 7*(5), 347-362.

Hammer, B., Loos, R., & Schwetzler, B. (2015). *Exit Through Exitus in Private Equity Buyouts.*

Harbula, P. (2011). Operating performance, valuation, leverage, and corporate governance of leveraged buy-out transactions: a continental European perspective. *Valuation, Leverage, and Corporate Governance of Leveraged Buy-Out Transactions: A Continental European Perspective (July 1, 2011).*

Hochberg, Y. V. (2012). Venture capital and corporate governance in the newly public firm. *Review of Finance, 16*(2), 429-480.

HSBC, (2011). *HSBC Private Bank France - Features of private equity funds.* Retrieved 24 April 2016, from http://hsbc-pbf09.isotools.fr/english/Features-Private-Equity.asp

Ivashina, V., & Kovner, A. (2011). The private equity advantage: Leveraged buyout firms and relationship banking. *Review of Financial Studies.*

Jacobsen, D. I., Sandin, G., & Hellström, C. (2002). *Vad, hur och varför: om metodval i företagsekonomi och andra samhällsvetenskapliga ämnen*: Studentlitteratur.

Jenkinson, T., & Sousa, M. (2015). What determines the exit decision for leveraged buyouts? *Journal of Banking & Finance, 59*, 399-408.

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers*, 323.*

Jensen, M. C. (1989). Eclipse of the Public Corporation. *Harvard Business Review, 67*(5), 61-74.

Jensen, M. C. (1993). The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. *Journal of Finance, 48*(3), 831-880.

Kaplan, S. (1989). The effects of management buyouts on operating performance and value. *Journal of Financial Economics, 24*(2), 217-254.

Kaplan, S.N., & Schoar, A. (2005). Private Equity Performance: Returns, Persistence, and Capital Flows*, 1791.*

Kaplan, S. N., & Strömberg, P. (2009). Leveraged Buyouts and Private Equity*, 121.

Knill, A. (2009). Should Venture Capitalists Put All Their Eggs in One Basket? Diversification versus Pure-Play Strategies in Venture Capital. *Financial Management, 38*(3), 441-486.

Ljungqvist, A., Richardson, M., & Wolfenzon, D. (2008). *The Investment Behavior of Buyout Funds: Theory and Evidence*. National Bureau of Economic Research, Inc, NBER Working Papers: 14180.

Lossen, U. (2007a). Performance of private equity funds: does diversification matter? *Portfolio Strategies of Private Equity Firms: Theory and Evidence*, 95-133.

Lossen, U. (2007b). *Portfolio Strategies of Private Equity Firms. [Elektronisk resurs] : Theory and Evidence*: Wiesbaden : Deutscher Universitäts-Verlag / GWV Fachverlage GmbH, Wiesbaden, 2007.

Manchot, P. (2010). Untersuchungsgegenstand Secondary Buyout *Secondary Buyouts: Eine empirische Untersuchung von Werttreibern* (pp. 65-83). Wiesbaden: Gabler.

Metrick, A., & Yasuda, A. (2010). The Economics of Private Equity Funds*, 2303.

Nikoskelainen, E., & Wright, M. (2007). The impact of corporate governance mechanisms on value increase in leveraged buyouts. *Journal of Corporate Finance, 13*, 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.

Panzar, J. C., & Willig, R. D. (1977). Economies of scale in multi-output production. *The Quarterly Journal of Economics*, 481-493.

Rhoades, S. A. (1993). Herfindahl-Hirschman index, the. *Fed. Res. Bull., 79*, 188.

Rose, E. K. (2011). The Principal Agent Problem, Asymmetric Information and Leveraged Buyouts: How Who Does the Buying Affects Who Gets Bought.

Sommer, C. (2012). *Private Equity Investments: Drivers and Performance Implications of Investment Cycles*: Springer Science & Business Media.

Sousa, M. (2010). *Why do private equity firms sell to each others?* University of Oxford. Unpublished, Saïd Business School.

Steindl, M. (2013). *The Alignment of Interests between the General and the Limited Partner in a Private Equity Fund—the Ultimate Governance Nut to Crack?* Paper presented at the The Harvard Law School Forum on Corporate Governance and Financial Regulation.

Strömberg, P. (2008). The new demography of private equity. *The global impact of private equity report, 1*, 3-26.

The Economist. (2014a). *Buy-in barons, 410*(8870), 75-75.

The Economist. (2014b). *Private equity: Barbarians at middle age, 410* (8879).

Wang, Y. (2012). Secondary buyouts: Why buy and at what price? *Journal of Corporate Finance, 18*(5), 1306-1325.

Wright, M., Amess, K., & Gilligan, J. (2009). The economic impact of private equity: What we know and what we would like to know. *Venture Capital, 11*(1), 1-21.

Zhou, D., Jelic, R., & Wright, M. (2014). SMBOs: Buying time or improving performance? *Managerial and Decision Economics, 35*(2), 88-102.

APPENDIX A

Variable Definitions

Variable Name	Description
Independent Variables	
Operating Profitability	Mean of operating performance over the 3-year period post-SBO. Computed as (EBIT/Total Assets) * 100
Turnover Growth	Geometric mean of the turnover growth over the 3-year period post-SBO.
Dependent Variables	
Industry_Specialized_Match_1	Dummy variable taking the value 1 when the PE firm's industry specialization (ICA>1) equals the industry of the acquired firm.
Industry_Specialized_Match_2	See above, the PE firm applies a higher degree of industry specialization (ICA>2).
Geography_Specialized_Match_1	Dummy variable taking the value 1 when the PE firm's geographic specialization (ICA>1) equals the regions of the acquired firm.
Geography_Specialized_Match_2	See above, the PE firm applies a higher degree of geographic specialization (ICA>2).
Control Variables	
Profitability_0	Operating performance in the buyout year, measure of initial profitability pre-SBO.
Turnover_0	The log of turnover during the buyout year: ln(Turnover_0). A measure of the portfolio company's initial size.
MSCI UK	Morgan Stanley Capital Index returns to assess the impact of market conditions during the buyout-year.
PE_Investments	Number of investments by the acquiring PE firm over the period 2007-2014,
Gearing_0	The portfolio company's leverage position measured as a debt-equity ratio during the buyout year. Retrieved from Capital IQ
Company Age	The age of the portfolio company in the buyout year. Computed as the difference between date of incorporation and buyout year.

APPENDIX B

Literature Review

This table presents previous research related to our study. The key articles below are used as a basis in our analysis for the literature review and comparisons among statistical results.

Study	Study Purpose	Sample Size	Location	Time Frame	Findings
Venture Capital					
De Clercq, D., & Dimov, D. (2008).	Study examining the effect of VC firms only investing in industries in which it has superior knowledge.	200 VC firms	US	1962 - 2002	A VC firm that applies a specialized investment strategy based on industry enhances their overall firm performance.
Gompers, P., Kovner, A., & Lerner, J. (2009).	Research on how organizational structure affects behavior and outcome on different types of VC firms.	11297 targets 822 VC firms	US	1975 – 2003	The degree of specialization is significant and positive related to a VC firm's performance. Poor performance of diversified VC firms is due to inefficient investments (across industries).
Knill, A. (2009).	Paper examining the outcomes of a "pure-play" specialization strategy versus diversification in VC.	1893 VC firms	US	1998 - 2006	A diversification strategy could undermine the expertise role of the VC/PE, potentially harming the portfolio company.
Norton, E., & Tenenbaum, B. H. (1993).	Investigate specialization versus diversification as an investment strategy in VC.	Survey; 98 Responses	US	1990	Specialization in connected stages is in favor from an information-sharing point of view.

Study	Study Purpose	Sample Size	Location	Time Frame	Findings
Private Equity					
Achleitner, A.K., & Figge, C. (2014).	Research on SBOs: do they have a value creation profile and differ their returns from PBOs?	2456 buyouts (448 SBOs)	EU	1990 - 2010	No significant evidence that SBOs generate lower returns than PBOs. Finding that SBOs are 28-30% more leveraged and 6-9% more expensive.
Achleitner, A.K., Figge, C., & Lutz, E. (2014)	Identification of potential value drivers in SBO transactions	Case	DE	2003	There is value creation potential in case the skills of the buying PE firm match the skills of the selling PE firm.
Bonini, S. (2015).	Identification of the variables affecting the large growth in SBO transactions & return differences LBOs -SBOs	1513 buyouts	EU	1998 - 2008	No significant result for differences in operating growth improvements between LBOs and SBOs. SBOs generate positive, yet lower returns than first round buyers.
Cressy, R., Munari, F., & Malipiero, A. (2007).	Examine the effect of PE firm specialization on the target's post-LBO performance.	122 LBOs	UK	1995-2002	Industry specialization of the PE firm enhances operating profitability. No significant results were found for turnover growth. Stage financing has no impact on post-LBO profitability .
Degeorge, F., Martin, J., & Phalippou, L. (2016).	Paper examining the concerns arising from the growth in SBO transactions	548 SBOs	Global	1996 – 2012	SBOs destroy value when the PE firm engage in these transactions under pressure. SBOs under no pressure perform comparable to PBOs.
Hammer, B., et al. (2015).	Study assessing the impact of PE firm characteristics and the buyout on the probability of default (PD).	5093 buyouts	Global	1997 – 2010	An overall diversified investment strategy lowers the PD of the PE firm. A PE firm with industry specialization lowers the PD when matching the industry of the target.
Lossen, U. (2007a)	Examine the effect of a PE firm's diversified investment strategy on fund IRR.	2871 buyouts 34 PE firms	US-EU	1979 – 1998	PE firm diversification with regards to industry enhances their fund IRR, while diversification across financing stages lowers the fund return.

APPENDIX C

Correlation Matrix

This table presents the pairwise correlations between the independent variables. For a description of the variables, refer to Appendix A. The correlation matrix below is based on using all the 115 observations ($N = 115$). Due to missing data points in our sample, the correlation of Gearing_0 with the other independent variables is based on 89 observations ($N= 89$). The significance level is denoted as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

	Turnover_0	Profitability_0	MSCI UK	PE_Investments	Gearing_0	Company Age
Profitability_0	0.214**					
MSCI UK	-0.060	0.134				
PE_Investments	0.205**	-0.002	0.007			
Gearing_0	0.112	-0.152	0.006	0.182*		
Company Age	0.141	0.008	-0.236**	-0.054	-0.184*	
Industry_Specialized_Match_1	0.146	-0.041	-0.167*	-0.202**	0.056	-0.016
Industry_Specialized_Match_2	0.042	0.006	-0.066	-0.221**	0.036	0.065
Geography_Specialized_Match_1	-0.213**	0.111	-0.013	-0.272**	-0.366***	0.029
Geography_Specialized_Match_2	-0.203**	0.029	0.018	-0.211**	-0.035	-0.052

APPENDIX D

Diagnostic Tests on OLS Regressions Operating Profitability

The White's test is conducted to test for heteroscedasticity in the regressions (Brooks, 2014). White's test 1 does not include modified standard errors and is a pure measure for heteroscedasticity. White's test 2 includes modified standards in order to measure heteroscedasticity and specification errors. The Durbin-Watson, Breusch-Godfrey 1 (lagged 2) and Breusch-Godfrey (lagged 4) measures correlation in the error terms (Brooks, 2014). The Jarque-Bera tests for the normality in the residuals (Brooks, 2014). Ramsey RESET tests the functional form of the specification (Brooks, 2014). The F-stats are given, including the significance level as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Test	With gearing				Without gearing			
	Industry 1	Industry 2	Geography 1	Geography 2	Industry 1	Industry 2	Geography 1	Geography 2
White's test 1	3,2***	2,74***	2,99***	3,28***	2,89***	2,66***	2,99***	3,86***
White's test 2	4,5***	4,14***	4,6***	4,92***	5,83***	3,77***	4,03***	4,89***
Durbin-Watson	2,25	2,14	2,08	2,24	2,11	2,23	2,16	2,10
Breusch-Godfrey 1	0,09	0,03	0,03	0,18	0,49	1,01	0,57	0,46
Breusch-Godfrey 2	0,18	0,06	0,06	0,22	1,20	1,01	1,25	1,05
Jarque-Bera	28,9***	9,07***	12,66***	21,24***	271,2***	275,18***	319,7***	262,37***
Ramsey RESET	0,4	0,01	0,1**	4,76	2,64	4,45**	3,29*	0,01

APPENDIX E

Diagnostic Tests on OLS Regressions Turnover Growth

The White's test is conducted to test for heteroscedasticity in the regressions (Brooks, 2014). White's test 1 does not include modified standard errors and is a pure measure for heteroscedasticity. White's test 2 includes modified standards in order to measure heteroscedasticity and specification errors. The Durbin-Watson, Breusch-Godfrey 1 (lagged 2) and Breusch-Godfrey (lagged 4) measures correlation in the error terms (Brooks, 2014). The Jarque-Bera tests for the normality in the residuals (Brooks, 2014). Ramsey RESET tests the functional form of the specification (Brooks, 2014). The F-stats are given, including the significance level as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Test	With gearing				Without gearing			
	Industry 1	Industry 2	Geography 1	Geography 2	Industry 1	Industry 2	Geography 1	Geography 2
White's test 1	0,98	0,76	1,79	0,76	2,66**	1,39	3,18***	1,25
White's test 2	0,45	0,31	1,10	0,29	1,49	0,82	2,26***	0,55
Durbin-Watson	2,29	2,29	2,28	2,36	2,05	2,06	2,06	2,05
Breusch-Godfrey 1	0,17	0,16	0,07	0,17	0,55	0,68	0,82	0,55
Breusch-Godfrey 2	0,00	0,00	0,00	0,00	0,27	0,33	0,42	0,29
Jarque-Bera	2289,28***	2519,29***	1876,3***	3061,29***	2049,63***	2295,65***	1555,7***	2268,78***
Ramsey RESET	1,19	1,1	3,12*	0,81	2,06	1,69	9,44***	1,11

Private Equity

Investment Strategy & Growth of the Private Equity Firm

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TABLE OF CONTENTS

LIST OF TABLES

1. INTRODUCTION

1.1. Problem Statement

Our findings in the main paper indicate that portfolio companies acquired by an industry specialized PE firm show greater improvements in the post-SBO operating profitability. The increase in profitability is expected to lead to more value creation when the PE firm has a specialized investment focus. The thesis supports the best-owner concept and previous research on specialization in LBOs (Cressy et al., 2007; Goedhart et al., 2015). However, PE firms are becoming more diversified due to the maturation of the PE industry (The Economist, 2014b). Lossen (2007a) found that PE firms with a specialized investment strategy exhibit lower IRRs. Besides, Knill (2009) found similar results in his study on VCs and stated that a diversified strategy results in potential misalignments between the VCs and the portfolio company. Hence, industrial diversification undermines the expertise role in the partnership between the investors and the portfolio company, while the investor itself benefits from diversification in terms of growth. The contradictory empirical results suggest a trade-off for the PE firm since specialization improves the operating profitability of the target firm (Cressy et al., 2007) and diversification on the other hand increases IRR of the PE fund (Lossen, 2007a). To our knowledge, limited research investigates the trade-off between a specialized and diversified investment strategy of PE firms. Further research is required to determine the effect of a specialized investment strategy on the PE firm performance.

1.2. Research Question

This working paper extends on the research conducted by Lossen (2007a). We examine the effects of the investment strategy on PE firm growth. The aim of this paper is to outline potential benefits and drawbacks from specialization concerning the PE firm. We attempt to answer the following research question: to what extent does a specialized investment strategy affect growth of the PE firm?

2. THEORY

2.1. Drivers of PE Firm Performance

2.1.1. Ability to Raise Capital

The ability to raise capital for subsequent funds is critical for the GPs. A substantial part of their wealth is tied to management fees on invested capital (Chung et al., 2012). Successful fundraising is a function of the GPs experience in the fundraising process (Arcot et al., 2015; Kaplan & Schoar, 2005). Experienced GPs are likely to have more connections with potential investors who are willing to invest in the PE fund (Zhou et al., 2014). This can enhance the ability to raise debt capital at favorable terms. Prominent PE firms can obtain cheaper financing with less stringent debt covenants (Demiroglu & James, 2007; Ivashina & Kovner, 2011). Moreover, a PE firm's track record is also a critical determinant of the ability to raise capital for subsequent funds (Kaplan & Schoar, 2005). According to (Nikoskelainen & Wright, 2007), the main factor to ensure future fundraising are historical returns earned by the fund. In addition, the reputation of a PE firm is related to the ability to raise capital (Bonini, 2015). Large PE firms are typically more reputable (Bonini, 2015) while young firms with less reputation rely more on their track record to raise capital (Arcot et al., 2015).

2.1.2. Reputation

The reputation of a PE firm has a significant impact on the performance of the portfolio companies and the performance of the PE fund (Arcot et al., 2015; Bonini, 2015; Degeorge et al., 2016; Zhou et al., 2014). According to Bonini (2015), highly reputable funds are able to hire superior managers and create more value in comparison to inexperienced funds with less reputation. In addition, less reputable PE firms are more likely to engage in suboptimal deals such as SBOs and more likely to pay higher multiples (Arcot et al., 2015; Bonini, 2015; Degeorge et al., 2016). Another factor affected by reputation is negotiation power (Bonini, 2015). Highly reputable firms have stronger bargaining skills while firms with low reputation are the weaker party in a negotiation. Strong negotiation skills are associated with higher returns and firms with better reputation are expected to provide higher returns. The negotiation power will also impact the financing terms (Demiroglu & James, 2007, 2010; Ivashina & Kovner, 2011; Kaplan & Strömberg, 2009). More prominent PE firms can obtain favorable financing with less stringent debt covenants and lower borrowing costs. Given the fact that PE

firms apply highly leveraged financing structures, more favorable financing conditions will have a positive impact on the returns (Kaplan, 1989; Wang, 2012).

2.1.3. Knowledge

Human capital is an important driver of performance and value creation in the PE firm (De Clercq & Dimov, 2008). PE firms utilize their industry and operating knowledge to identify attractive investment opportunities and develop value creation plans for investments made (De Clercq & Dimov, 2008; Kaplan & Strömberg, 2009). Reputable PE firms will use their extensive network and experience to exploit growth opportunities for the portfolio companies (Zhou et al., 2014). Experience of the PE firm is positively correlated with growth of the PE firm (Zhou et al., 2014) and the performance of the portfolio company (De Clercq & Dimov, 2008; Kaplan & Schoar, 2005). In general, experience enables PE firms to: successfully raise larger funds (Metrick & Yasuda, 2010), significantly increase the probability of successful exits (Strömberg, 2008) and reduce the probability of default of the portfolio companies (Hammer et al., 2015; Strömberg, 2008; Tykvová & Borell, 2012).

Firms can strive to develop a broader knowledge base or in-depth knowledge in certain domains (De Clercq & Dimov, 2008). The value created in deals is determined by how well knowledge and experience can be applied in different situations. A broader knowledge base can be implemented in more areas while in-depth knowledge should be associated with outperformance within their domain. Continuous investments and experience in a certain domain will further develop in-depth knowledge of that domain (Cohen & Levinthal, 1990). The capabilities of the PE firm will be enhanced within that domain as a source of competitive advantage (Grant, 1996). In addition, PE firms with in-depth knowledge in certain industries will be able to provide better advice and more effective monitoring as they are more aware of the competitive environment in addition to the strengths and weaknesses of the target firms (Cressy et al., 2007; Eisenhardt, 1989). Dimov and Shepherd (2005) found that broad general knowledge has a positive impact on the probability of successful exits while more specific in-depth knowledge reduces the probability of portfolio companies defaulting.

Experience comes directly from engaging in deals as well as prior business experience of the GPs (Bottazzi et al., 2008; Degeorge et al., 2016; Nikoskelainen & Wright, 2007). The GPs knowledge and experience will influence a PE firm's investment activities (Bottazzi et al.,

2008). The nature of the GPs background is related to which types of deals they outperform in (Acharya et al., 2009; Degeorge et al., 2016). GPs with prior consultancy experience are associated with outperformance in internal value-creation strategies while GPs with finance background tend to outperform in M&A deals (Acharya et al., 2009; Degeorge et al., 2016). Moreover, reputable PE firms are associated with the recruitment of professionals with different backgrounds (Kaplan & Strömberg, 2009).

2.1.4. Size

The size of the PE firm captures many important dimensions related to performance, such as reputation, economies of scale and learning (Phalippou & Zollo, 2005). Knowledge is related to the size of the PE firm. Large PE firms make more investments which in turn enhances the experience of the PE firm (Nikoskelainen & Wright, 2007). Moreover, the size of the PE firm is associated with economies of scale and cost efficiency of the funds and thereby performance of the PE firm (Cressy et al., 2007). However, with too many acquired companies, it becomes increasingly difficult for the PE firm to be actively involved in the operations and monitoring of the portfolio companies (Phalippou & Zollo, 2005).

The width of the firm's network is also related to the size of the PE firm (Cressy et al., 2007). A wider network is associated with better performance since it provides information flows, capabilities (Burt, 2009) and investment opportunities that otherwise might not be available to the PE firm (Cressy et al., 2007). The network is also an important value driver for the investments since PE firms will use their network to exploit growth opportunities for the target companies (Zhou et al., 2014). This creates growth incentives for PE firms in order to establish a greater reach of their network to access information and resources.

2.1.5. Investments

PE firms screen the market for potential investment opportunities, in particular for targets with failing control functions and excess cash flows (Jensen, 1986, 1989). The value of these underperforming portfolio companies is enhanced through rigorous control mechanisms such as monitoring, incentive alignments and high leverage. Moreover, PE firms use their experience and knowledge to generate returns by active involvement in the management of the firm (Jensen, 1993). The target firms are improved through strategic changes, productivity enhancements, management replacements, strategic changes, acquisitions and divestments

(Acharya et al., 2009). The IRR is determined by the entry and exit values of the portfolio company, incurred costs and the holding period (Damodaran, 2010). A PE firm can maximize the IRR when more value creation is realized within the portfolio company in a shorter period.

2.2. Management Fees and Carried Interest

Roughly 84% of the total PE firms engaging in buyouts have the same fee structure (Metrick and Yasuda, 2010). Management fees and carried interest are two components that determine a PE firm's turnover (Ghai et al., 2014). Management fees provide the GPs an incentive to invest committed capital early throughout the investment period of the PE fund (Arcot et al., 2015). Metrick and Yasuda (2010) found that management fees account for 60% of the NPV of the GP's income. The fees are in the range of 1.5% to 2.0% of the total amount of committed capital during the investment period (Gompers & Lerner, 1996; Kaplan & Schoar, 2005; Ljungqvist et al., 2008).

The second main source of income is carried interest, which is a variable component determined by the performance of the fund (Metrick & Yasuda, 2010). Towards the end of the PE fund, the portfolio companies are divested, and the realized return is divided. In case the PE firm manages to maximize value creation, carried interest will be higher, leading to an increased earnings. Carried interest represents the share of the PE firm on the profits, covering roughly 20% (Kaplan & Strömberg, 2009).

To measure PE fund performance based on management fees is a recurring debate (Gottschalg, et al., 2004; Kaplan & Schoar, 2005; Phalippou & Zollo, 2005). Jensen (1989) argues that incentives for completing more transactions, "money-chasing-deals", becomes stronger than delivering good deals (Gompers & Lerner, 1996). This results in a higher compensation base earned with front-end fees (management fees) than profits due to the enhancement of the portfolio company (carried interest). Intuitively, PE firms obtaining growth based on front-end fees exercise a diversified investment strategy while maximizing value creation potential is closely related to specialization.

2.3. Turnover and IRR of the PE Firm

The key measure many practitioners use to assess PE fund performance is the internal rate of return (IRR) (Ljungqvist et al., 2008; Phalippou & Gottschalg, 2009). According to Damodaran (2010), the discount rate that sets the cash flows to a NPV of zero is the IRR. The gross IRR is

calculated as the return on invested capital excluding the incurred costs (1). To compute the net IRR (2), one has to deduct all fees related to the investment; management fees, carried interest and other operational costs (Demaria, 2015).

$$Gross\ IRR = Return\ on\ invested\ capital \qquad (1)$$

$$Net\ IRR = Return\ on\ invested\ capital - Management\ Fees - \qquad (2)$$
$$Carried\ Interest - Other\ Expenses$$

As discussed before, management fees and carried interest are the two key determinants generating income for the GPs and their PE firm. Since we are unable to access databases providing PE Fund returns (IRRs), we examine the effect of investment strategy on turnover growth of the PE firm. According to Damodaran (2008), turnover growth tends to be a more predictable and persistent measure compared to the IRR, due to a smaller effect of accounting standards. However, to neglect differences across periods due to time-value, the geometric mean of turnover growth is computed (Sommer, 2012). Despite it is a rough measure, we believe that this variable will capture the impact of a diversified versus specialized investment strategy on turnover growth, given the fact that carried interest and management fees are the two key components of the PE firm turnover (3).

$$PE\ Firm\ Turnover = Management\ Fees + Carried\ Interest \qquad (3)$$

2.4 Specialization and Diversification

PE firms benefit from specialization as information asymmetries associated with investments are reduced (Eisenhardt, 1989). Furthermore, similarities between different portfolio companies should improve the efficiency for GPs to manage and improve portfolio companies actively (Grant, 1988). The portfolio company's performance will improve when GPs only invest in industries where they have more knowledge (De Clercq & Dimov, 2008) and a competitive advantage (Grant, 1991). On the contrary, PE firms with a diversified investment strategy could benefit from other sources of value creation. A diversification strategy will naturally broaden the market for investment opportunities as they will face a greater number of potential targets in more industries and geographic regions (Lossen, 2007a). Moreover, a diversified PE firm will accumulate a broader range of knowledge within the PE firm (Hamel, 1991). A broader skill set in the PE firm will influence performance if internalized knowledge is shared within the organization and can be applied to new geographic markets and new industries (Fang, Wade, Delios, & Beamish, 2007).

3. HYPOTHESES

3.1. Specialization and PE firm performance

A specialized investment strategy has many potential benefits. Due to a higher degree of specialized knowledge, the PE firm engages in superior investments ultimately enhancing the potential return (Gupta & Sapienza, 1992; Lossen, 2007a; Norton & Tenenbaum, 1993).

Gompers et al. (2009) found that industry specialized VCs improve the likelihood of investing in a portfolio company with greater value creation potential. PE firms are expected to benefit from specialization as information asymmetries associated with investments are reduced (Eisenhardt, 1989). Furthermore, a higher degree of specialization will enable the investment management of the PE to manage investment risks and reduce the probability of default of the portfolio company (Bygrave, 1987, 1988; Hammer et al., 2015). Another benefit from specialization is the access to more detailed information through networks and industry or geography specific human capital gained by the investment management (Bygrave, 1987, 1988; Cohen and Leventhal 1990; Gompers et al., 2009).

Each PE firm has a particular strategy to acquire targets based on size, industry, region, stage. This investment strategy is determined by the capabilities and experience of the GPs. However, the tremendous growth of the PE industry makes the PE firms' screening process for investment opportunities increasingly difficult (The Economist, 2014b). A diversification strategy gains popularity as it enables the PE firm to access a broader scope of potential portfolio companies. In line with the maturing industry, PE firms prefer a diversified, less risky, portfolio simply ensuring returns (Lossen, 2007b).

To remain viable in the increasingly competitive and maturing PE industry, we expect a specialized investment strategy to enhance the growth of the PE firm. We expect diversified PE firms to exhibit lower turnover growth in comparison to specialized PE firms. (Gupta & Sapienza, 1992; Lossen, 2007a; Norton & Tenenbaum, 1993);

Hypothesis 1a: The PE firm turnover growth is enhanced if the PE firm applies a
specialized investment strategy based on industry.

Hypothesis 1b: The PE firm turnover growth is enhanced if the PE firm applies a specialized
investment strategy based on geographic area.

4. METHODOLOGY

4.1. Sample Setting & Data Collection

To test the effect of a diversified or specialized investment strategy of the PE firm on its performance, we create a data set of PE firms over the period 2007 to 2014. We retrieve the data from the Capital IQ database. The sample set is reduced to 179 observations, taking only the PE firms with the following data available; portfolio dispersion across industries/regions and headquarters locations.

After setting the sample, we gathered PE firm-specific information to be able to assess performance. We collected data regarding the date of incorporation and turnover figures during the period 2007 to 2014. PE firms are to some extent exempted from public disclosure requirements, making it difficult to retrieve data for the 179 PE firms (Kaplan & Schoar, 2005). Due to lack of available data for 56 observations, the final sample set includes the data of 123 PE firms.

4.2. Variables

4.2.1. Dependent Variable

We measure the effect of a specialized versus diversified investment strategy on the PE turnover growth. The turnover growth of the PE is computed as the geometric mean of operating revenues for all the PE firms over the period 2007 to 2014. The geometric mean of turnover growth is computed (Sommer, 2012):

$$Geometric\ turnover\ growth\ PE\ Firm = \ (\textstyle\prod_{i=1}^{7} x_i)^{1/7} = \ \sqrt[7]{x_1 x_2 \ldots x_7} \qquad (4)$$

4.2.2. Independent Variable: Dummy Industry Diversification

To measure differences in growth between industry specialized and diversified PE firms, we constructed a dummy variable for diversification. In order to construct this variable, we first determine the dispersion of investments in the portfolio of the PE firm across industries using the Index of Competitive Advantage (ICA) (Archibugi and Pianta, 1994).

$$ICA_{ij} = (\ C_{ij}\ /\ C_{.j}\ )\ /\ (C_{i.}\ /\ C_{..})\qquad\qquad\qquad\qquad (5)$$

The dot indicates the sum related to the data set and description below:

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

$C_{.j}$ is the total number of companies invested in industry 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 industries)

The numerator of the ICA formula ($C_{ij}\ /\ C_{.j}$) represents the PE firm i's share of all investment in industry j and the denominator ($C_{i.}\ /\ C_{..}$) its share in all investments across all industries. In other words, the ICA_{ij} is measuring a firm's investment strategy relative to their peers.

There are ten different industries, according to the broad industry classification of Capital IQ, a PE firm can invest in: consumer discretionary, industrials, healthcare, financials, information technology, consumer staples, energy, materials, utilities and telecom. According to Cressy et al., (2007), a PE firm is specialized in a specific industry when the ICA is above one. To determine whether the PE firm applies an overall specialized investment strategy, we have to examine all the ICA scores for the industries in which the PE is active. We define the investment strategy as specialized or diversified based on the following qualifications:

- In case the ICA $\geq 1 = (\ C_{ij}\ /\ C_{.j}\ ) \geq (C_{i.}\ /\ C_{..})$ for ≤ 3 industries, the PE firm applies a specialist investment strategy.
- In case the ICA $\geq 1 = (\ C_{ij}\ /\ C_{.j}\ ) \geq (C_{i.}\ /\ C_{..})$ for ≥ 3 industries, the PE firm applies a diversified investment strategy.

By this definition we classify 67 PE firms as industry specialized in our sample (N=123) and 56 PE firms as industry diversified.

4.2.3. Independent Variable: Dummy Geographic Diversification

Using the same method as described above, we construct a dummy for PE firms that apply a diversified investment strategy on geographic region. Capital IQ applies a geographic classification based on the following five regions; USA, Europe, APAC, Latin America, AMEA. We define the investment strategy as specialized or diversified based on the following qualifications:

- In case the ICA $\geq 1 = (C_{ij} / C_{.j}) \geq (C_{i.} / C_{..})$ for $= 1$ region, the PE firm applies a specialist investment strategy.

- In case the ICA $\geq 1 = (C_{ij} / C_{.j}) \geq (C_{i.} / C_{..})$ for ≥ 2 regions, the PE firm applies a diversified investment strategy.

By this definition, we qualify 85 PE firms as specialized in a geographic region and 38 PE firms diversified.

4.2.4. Control Variables

Initial turnover and the total assets during the first year (2007) of our period are included as control variables. Initial turnover and total assets in our regression are expressed in relative terms, taking the log of the measures in the base year of our sample.

The age of the PE firm is added as a control variable to mitigate the effects of experience. It is measured as the number of years from the date of incorporation to the base year, 2007, of our sample set. Previous research that examines the relation between PE fund experience and the rate of return reported a significant positive impact (Gottschalg et al., 2004; Kaplan & Schoar, 2005).

An additional control variable is included to distinguish PE firms based on their headquarters. The dummy indicates whether the PE firm is located in the EMEA region or US/Canada. According to Phalippou and Zollo (2005), the age of the PE industry differs among regions. The US market is more mature and at a higher point in the learning curve. In addition, this dummy variable mitigates the effects of differences in regulations, market conditions and accounting standards in our sample set.

Furthermore, a control variable is added to mitigate the effects of a listed PE firm. This is an additional indicator of size as large PE firms are more likely to be listed.

The number of portfolio companies acquired by the PE firm is included as a proxy for fund size (Lossen, 2007a). The size of the PE firm is associated with economies of scale which could influence the performance of the portfolio company (Cressy et al., 2007). As a consequence, we include the total number of investments performed by the PE firm as a proxy for size.

4.3 Validity and Reliability

4.3.1. Internal Validity

Internal validity is about whether we actually measure what we think we measure (Jacobsen et al., 2002). In particular, the extent to which causality between the investment strategy of the PE firm and growth of the PE firm can be determined. Concepts and definitions used in this paper are adopted in previous research. The geometric growth in turnover has been used in previous research to determine company growth and performance (Cressy et al., 2007; Degeorge et al., 2016; Nikoskelainen and Wright, 2007). The data used in this paper comes from audited annual reports which we consider to ensure high validity. However, turnover growth is a suboptimal proxy for the performance of the PE firm. Arguably, it is not a clean measure of improved operating performance as some companies may pursue unprofitable growth in turnover for various reasons (Goedhart et al., 2015). However, as most previous research on the PE industry, we lack access to necessary data to make a distinction between profitable and unprofitable turnover growth. A better measure for the performance of the PE firm would be the internal rate of return as adopted by (Lossen, 2007a). Data on IRR of the PE firms is inaccessible to us at this point. The Index of Competitive Advantage (Cressy et al., 2007) and similar measures such as the Herfindahl-Hirschman Index (Arcot et al., 2015; Degeorge et al., 2016; Lossen, 2007a) are widely adopted as measures for the level of concentration in an investment portfolio. The PE industry is known for complex business structures (Kaplan & Schoar, 2005). Since our classification of the PE firm depends on past investment history recorded in the database Capital IQ, omission of transactions and inaccurate classifications in terms of industry or region, could lead to biased the classifications of degree of specialization or diversification of the PE firms. Like many studies in this area, we lack the data and time to address this potential bias and as a consequence, the validity is considered lower for the ICA variable.

4.3.2. External Validity

The external validity relates to the degree in which the results can be generalized and applied in other contexts (Jacobsen et al., 2002). The main question is whether the sample is an appropriate estimation of the population. The sample consists of PE firms worldwide, which enhances the generalizability of the sample. However, the PE industry is to some extent exempted from public disclosure requirements (Kaplan & Schoar, 2005). This might bias the sample to contain mostly large PE firms, PE firms that are publicly listed or PE firms in regions

with stricter disclosure requirements. Furthermore, 56 observations were excluded from the sample in the selection process due to the lack of available data for all relevant variables. This could again bias our sample towards large and publicly listed PE firms as information is more easily accessible for large and publicly listed companies. However, these potential biases are difficult to avoid and present in most previous research (De Clercq & Dimov, 2008; Kaplan & Schoar, 2005; Kaplan & Strömberg, 2009; Wang, 2012; Zhou et al., 2014).

4.3.3. Reliability

Reliability relates to the extent to which results are replicable and can be repeated (Jacobsen et al., 2002). To ensure reliability the process of this research paper thoroughly documented in the methodology chapter. Data has been systematically retrieved from well-known and reliable databases such as Capital IQ, Zephyr and Orbis. The investment strategy of the PE firm has been classified in a systematic manner using techniques based on previous research (Cressy et al., 2007).

5. RESULTS AND ANALYSIS

In the methodology chapter, we elaborated on the sample setting and data collection process. The chapter also contained a detailed description of the variables and method used to test the hypotheses. In the following chapter, we present and analyze the results to reject or confirm the hypotheses.

5.1. Descriptive Statistics

Table I reports the summary statistics for our data set. The mean of PE firm turnover growth during the period 2007-2014 is 8.31%, while total asset growth is 9.45%. The average age of the PE firm, at the beginning of our sample period, is 16.7 years. The majority of the PE firms in our sample (N=1123) are classified as diversified on industry (N=67) and (N=85) on geographic region. The average number of investments conducted by the PE firm during the period 2007-2014 is 42.36 with a standard deviation of 45.62.

The correlation between independent variables in the final regression are moderate and indicate no multicollinearity. The correlation matrix is presented in Table II. The statistically significant correlation between PE firm age and initial turnover (0.423) implies that more mature firms have higher turnover numbers. This finding is intuitive since older PE firms has been able to grow over a longer time period. Moreover, we find a strong correlation (0.381) between turnover and whether the PE firm is listed. This finding indicates that PE firms with higher turnover are more likely to be publicly listed. Listed firms are also likely to be older as shown by the positive correlation (0.272) between Listed and PE Firm Age. Another observation worth mentioning is the correlation between the number of investments and the main independent variables industry and geographic diversification, see Table II. The positive correlations (0.195 and 0.357 respectively) indicate that PE firms are more likely to be diversified when they engage in many investments. In Table II, we find that the correlation between the number of investments and the size of the PE firm in terms of assets (0.221) and revenues (0.204). This suggests that large PE firms are more likely to be diversified. To clarify if this is the case in our sample, we proceed with an ANOVA-test as shown in Table III.

Table I
Summary Statistics

Table I presents the summary statistics of our sample containing 123 PE firms (*N*=123) over the period 2007-2014. Turnover Growth and Total Assets Growth is measured as the geometric growth in turnover and total assets over the sample period. The dummy variable Industry Diversification takes on the value 1 if the PE firm has an ICA>1 in three or more industries. Geographic Diversification is a dummy variable with value 1 if the PE firm has an ICA > 1 in two or more regions. Control variables in the sample are Turnover_0 (log turnover in the base year 2007), Total Assets_0 (log total assets in the initial year 2007), PE Firm Age (age of the PE firm in the year 2007), Listed (dummy variable, 1 if the PE firm is publicly listed), EMEA (dummy variable, 1 if PE firm is based in the EMEA region) and the number of investments (direct investments in the period 2007-2014).

Variable Name	Mean	Median	Std. Dev.
Dependent Variables			
Turnover Growth	8.31	6.15	16.82
Total Asset Growth	9.45	6.41	16.81
Independent Variables			
Industry Diversification	0.45	0.00	0.50
Geographic Diversification	0.30	0.00	0.46
Control Variables			
Turnover_0	9.10	8.89	1.89
Total Assets_0	9.12	8.73	2.32
PE Firm Age	16.74	11.00	29.13
Listed	0.14	0.00	0.35
EMEA	0.91	1.00	0.28
Number of Investments	42.36	23.00	45.62

Table II
Correlation Matrix

Table II presents the pairwise correlations between the independent variables for the 123 observations (*N*=123). The significance level is denoted as following, * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

	PE Age	Listed	EMEA	T_0	TA_0	No. of Investments
Listed	0.272***					
EMEA	0.007	-0.434***				
Turnover_0	0.423***	0.381***	-0.193**			
Total Assets_0	0.388***	0.593***	-0.379***	0.845***		
Number of Investments	-0.041	0.049	-0.240***	0.204**	0.221**	
Geographic Diversification	-0.039	0.121	-0.098	0.279***	0.173*	0.195**
Industry Diversification	-0.092	0.037	-0.056	0.042	0.220**	0.357***

5.2. Hypothesis Testing

5.2.1. ANOVA-tests

In Table III, we present the results from a simple ANOVA-test on the size of the PE firm based on revenues and total assets. We use the test to clarify if there are significant differences in size between PE firms diversified on geographic region or industry in comparison to specialized PE firms. We find significant results indicating that PE firms, diversifying on geographic region, are typically larger in terms of turnover (at 1% significance level). Furthermore, we find significant differences in the size of total assets for diversification in industry (at 10% significance level) or geographic region (at 5% significance level). However, we do not find significant differences in size of turnover between specialized and diversified PE firms based on industry. Overall, we can conclude that PE firms classified as diversified in this sample are typically larger than specialized PE firms. The Economist (2014b), stated that large PE firms are diversifying. This seems to be true for our sample as shown in Table III.

Table III
Diversification & Size of the PE Firm

Table III presents a simple ANOVA-test to assess whether there are significant differences in average size for diversified and specialized PE firms in terms of turnover or total assets in the initial year, 2007. The F-statistic denotes the significance as follows; * significance at 10% level; ** significance at 5% level; ***significance at 1% level.

	Log Turnover_0					Log Total Asset_0				
	Industry Diversification		Geographic Diversification		Total Sample	Industry Diversification		Geographic Diversification		Total Sample
Dummy	0	1	0	1	-	0	1	0	1	-
Mean	9.03	9.19	8.75	9.89	9.10	8.76	9.56	8.78	9.89	9.12
Std. Dev.	1.79	2.01	1.69	2.08	1.89	2.17	2.43	2.08	2.65	2.32
No. of Obs.	67	56	85	38	123	67	56	85	38	123
F-stats	0.219		10.24***			3.77*		6.20**		

Table IV
Diversification & Dependent Variables

Table IV presents a simple ANOVA-test to assess whether there is a significant difference in means for diversified or specialized PE firms concerning turnover growth or asset growth. The F-statistic denotes the significance as follows; * significance at 10% level; ** significance at 5% level; ***significance at 1% level.

	Turnover Growth					Total Asset Growth				
	Industry Diversification		Geographic Diversification		Total Sample	Industry Diversification		Geographic Diversification		Total Sample
Dummy	0	1	0	1	-	0	1	0	1	-
Mean	4.69	12.65	8.36	8.21	8.31	9.83	9.00	10.54	7.02	9.45
Std. Dev.	13.03	19.73	17.70	14.91	16.82	16.73	17.06	18.45	12.28	16.81
No. of Obs.	67	56	85	38	123	67	56	85	38	123
F-stats	7.167***		0.001			0.074		1.148		

To examine the differences in growth for the diversified and specialized PE firms, we compute a simple ANOVA-test as shown in Table IV. The result shows that the mean of turnover growth significantly differs (at 1% significance level) when PE firms diversify on industries compared to specialization. As we proceed, we will only focus on the differences between industry diversified and specialized PE firms for the dependent variable turnover growth. The mean geometric turnover growth in the sample period is 8.31% for all observations (N=123). PE firms that diversified among industries had a turnover growth of 12.65% (N=56) while specialized PE firms had an average of 4.69% (N=67).

5.2.2. Diagnostic tests

We perform diagnostic tests to ensure that the OLS-assumptions hold and the regression estimates are unbiased and efficient, before analyzing the results of our regressions, White's test for heteroscedasticity shows the presence of heteroscedasticity in the error terms at a 5% significance level. We use White's heteroscedasticity-consistent error terms in the regression to prevent that the model suffers from heteroscedasticity in the error terms. Also, we find that the residuals are not normally distributed (at 1% significance level). However, we believe that our sample size is sufficiently large (N=123) to ignore the non-normality in our sample and thereby include the outliers as they contain valuable information. To ensure that outliers had no significant impact, we ran the regressions presented in chapter 5 excluding the outliers and found little difference. The Ramsey RESET-test shows that our regression suffers from misspecification (at 1% significance level). Since the F-statistic in the Ramsey RESET test (15.59) is higher than in our regression (11.89), we are aware that there are missing independent variables that can explain turnover growth. Using the Breusch-Godfrey test, we find no correlation between the error terms for the cross-sectional data. As previously mentioned in Table II, we find no indication of multicollinearity between the independent variables used in the regression.

5.2.3. OLS regression

In Table V, we present the regression output used to test hypothesis 1a. The coefficient for the variable industry diversification is positive and statistically significant (at 5% significance level). PE firms that diversified across industries had higher turnover growth in comparison to specialized PE firms. On average, the turnover growth was 6.46% higher for diversified PE firms. Based on this evidence, we can reject hypothesis 1a. The turnover growth of the PE firm

is enhanced when a diversified investment strategy based on industry is applied. In this regression, we also find that PE firms that initially had high turnover as measured by the variable Turnover_0, have lower turnover growth.

To conclude our analysis, we acknowledge that specialization on geographic region or industry does not enhance the performance of the PE firms in terms of turnover growth or growth in total assets. We find no statistically significant results for differences in turnover growth for diversified and specialized PE firms. PE firms that diversify across industries exhibit higher turnover growth in comparison to specialized PE firms. However, as discussed in the diagnostic tests, the results are not completely reliable since the model suffers from misspecification. The misspecification is likely to derive from omitted variables, which is also indicated by the low R^2 (0.343) and adjusted R^2 (0.309). Further research on the tradeoff between specialization and diversification for PE firms should identify and include additional variables that can explain the turnover growth to extract more reliable results. These results will be discussed further in the following chapter.

Table V
Turnover Growth & Industry Diversification

This table presents the regression output for Industry Diversification on the geometric mean of turnover growth over the time period 2007-2014. The coefficients and the standard errors are included. White's heteroscedasticity-consistent standard errors are used due to the presence of heteroscedasticity. The significance level is denoted as following: * significance at 10% level; ** significance at 5% level; *** significance at 1% level.

Variable	OLS Turnover Growth
Intercept	55.216***
	(11.203)
Industry Diversification	6.462**
	(2.915)
Turnover_0	-5.392***
	(1.194)
PE Firm Age	0.052
	(0.048)
EMEA	-6.010
	(5.343)
Number of Investments	0.070**
	(0.025)
Listed	6.153
	(6.274)
R^2	0.343
Adjusted R^2	0.309
No. of Observations	123
F-statistic	10.109
Probability (F-statistic)	0.000

6. DISCUSSION & IMPLICATIONS

The aim of this study was to outline potential benefits and drawbacks from specialization of the PE regarding performance. To investigate this, we examined the effect of differences in total asset growth and turnover growth for specialized and diversified PE firms, both across industries and geographic regions. As presented in Table IV, we found no statistically significant differences in asset growth among PE firms classified as diversified or specialized. We found no statistically significant difference in turnover growth for PE firms classified as diversified or specialized on geographic region. However, we found statistically significant differences in turnover growth for diversification across industries. As shown in Table V, PE firms classified as diversified, experienced a turnover growth of 6.46% higher (at 5% significance level) than PE firms with a specialized investment strategy.

The turnover of the PE firm is determined by management fees and carried interest (Ghai et al., 2014). Management fees are obtained as a percentage of committed or invested capital in the PE funds managed by the PE firm (Metrick & Yasuda, 2010). To enhance turnover growth, the PE firm has to continue to successfully raise subsequent funds. The ability to raise funds is related to the experience, reputation and proven track record of the PE firm (Arcot et al., 2015; Kaplan & Schoar, 2005). Reputation and experience are related to the size and age of the PE firm (Bonini, 2015). As shown in Table III, we find no statistically significant difference in size of the PE firms in terms of turnover between diversified and specialized PE firms based on industry. However, as shown in Table III, size measured as total assets indicates that PE firms classified as diversified, are on average larger in our sample (at 10% significance level). For this reason, we cannot rule out the possibility that the increases in turnover growth for diversified PE firms is due to the size of the PE firm.

A diversification strategy enables the PE firm to access a broader scope of potential investments (Lossen, 2007b). With a broader investment strategy, diversified PE funds invest in different regions and industries. The positive correlation between the number of investments and geographic diversification (0.195 at 5% significance level) and between the number of investments and diversification across industries (0.257 at 1% significance level) indicates that PE firms that diversify engage in more investments than specialized PE firms. Since most of the turnover relates to management fees on committed or invested capital (Metrick & Yasuda, 2010), PE firms that diversify across industries, grow faster in terms of revenues in comparison

to specialized PE firms. However, this cannot be entirely determined within this paper as we do not have access to the fund size of the different PE firms used in this sample. Instead, we use the number of investments rather than the total size of investments in the sample period, which neglects the possibility that some PE firms make many small investments rather than a few large.

Lossen (2007a), found that PE firms that diversified across industries exhibited higher internal rate of returns (IRR) in comparison to specialized PE firms. A higher IRR translates to carried interest, which increases the turnover of the PE firm (Ghai et al., 2014; Metrick & Yasuda, 2010). There are several potential explanations to why diversified PE firms outperform specialized PE firms in terms of IRR. As previously mentioned, diversified PE firms have a broad array of investment opportunities which could lead to better selection of valuable targets. Moreover, PE firms gain experience form continuous investments in either specific or broad domains (De Clercq & Dimov, 2008). Performance is determined by how well the accumulated experience can be applied to subsequent investments. If knowledge and experience from previous investments in certain industries can be applied to other industries, diversified PE firms might be able to outperform specialized PE firms. Moreover, reputable PE firms are associated with hiring professionals with different backgrounds (Kaplan & Schoar, 2005) which influences the nature of transactions in which they outperform (Bottazzi et al., 2008). As previously stated, the PE size is related to the reputation of the PE firm (Bonini, 2015). Diversified PE firms are on average larger than specialized PE firms in terms of total assets as shown in Table III. If diversified PE firms have greater reputation and are able to attract experienced professionals with different backgrounds, the PE firm will have a wide range of in-house knowledge that can be applied to making good investments across industries.

As discussed at length in our previous paper, specialized PE firms enhance the economic performance of the portfolio companies to a greater extent than diversified PE firms. However, as shown in Table V, we find that PE firms that diversify across industries has additional growth in turnover of 6.46% (at 5% significance level) in comparison to specialized PE firms. In addition to the findings of Cressy et al., (2007) and Lossen (2007a), this evidence implies a trade-off between a diversified and specialized investment strategy for the PE firm. As noted by (Knill, 2009), the choice of investment strategy results in potential misalignments between the investor and the portfolio company. Industrial diversification undermines the expertise role in the partnership between the investor and the portfolio company, while the investor itself

benefits from diversification in terms of growth. Suggestion for further research is to investigate the trade-off in greater detail and the cause of the increased turnover growth and higher IRRs associated with diversification.

7. CONCLUSION

This paper extends on the research on the potential benefits and drawbacks of a specialized investment strategy applied by a PE firm. We investigate the following hypotheses: (1) The PE firm turnover is enhanced if the PE firm applies a specialized investment strategy based on industry: and (2) The PE firm turnover is enhanced if the PE firm applies a specialized investment strategy based on geographic area. To test these hypotheses, a sample consisting of 123 PE firms worldwide in the period 2007-2014 was constructed. We used the Index of Competitive Advantage to classify PE firms as specialized or diversified across industry and regions. We found that (1) diversified PE firms have greater turnover growth in the sample period and thereby reject the first hypothesis. We did not find any significant results for (2), and thereby reject the second hypothesis. Our results indicate that PE firms diversifying across industries have a 6.46% higher turnover growth in comparison to specialized PE firms.

BIBLIOGRAPHY

Acharya, V. V., Hahn, M., & Kehoe, C. (2009). *Corporate Governance and Value Creation: Evidence from Private Equity*. C.E.P.R. Discussion Papers, CEPR Discussion Papers: 7242.

Archibugi, D., & Pianta, M. (1994). Aggregate convergence and sectoral specialization in innovation. *Journal of Evolutionary Economics, 4*(1), 17-33.

Arcot, S., Fluck, Z., Gaspar, J.-M., & Hege, U. (2015). Fund managers under pressure: Rationale and determinants of secondary buyouts. *Journal of Financial Economics, 115*, 102-135.

Bernstein, S., Lerner, J., Sørensen, M., & Strömberg, P. (2010). Private equity and industry performance: National Bureau of Economic Research.

Bonini, S. (2015). Secondary Buyouts: Operating Performance and Investment Determinants. *Financial Management, 44*(2), 431-470.

Bottazzi, L., Da Rin, M., & Hellmann, T. (2008). Who are the active investors?: Evidence from venture capital. *Journal of Financial Economics, 89*(3), 488-512.

Burt, R. S. (2009). *Structural holes: The social structure of competition*: Harvard university press.

Bygrave, W. D. (1987). Syndicated investments by venture capital firms: A networking perspective. *Journal of Business Venturing, 2*(2), 139-154.

Bygrave, W. D. (1988). The structure of the investment networks of venture capital firms. *Journal of Business Venturing, 3*(2), 137-157.

Chung, J.-W., Sensoy, B. A., Stern, L., & Weisbach, M. S. (2012). Pay for performance from future fund flows: the case of private equity. *Review of Financial Studies, 25*(11), 3259-3304.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128-152.

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*(4), 647-669.

Damodaran, A. (2008). Growth and Value: Past growth, predicted growth and fundamental growth. *Stern School of Business*.

Damodaran, A. (2010). *Applied corporate finance*: John Wiley & Sons.

De Clercq, D., & Dimov, D. (2008). Internal knowledge development and external knowledge access in venture capital investment performance. *Journal of Management Studies, 45*(3), 585-612.

De Simon, M. (2012). Private Equity: overview of European Secondary Buyouts.

Degeorge, F., Martin, J., & Phalippou, L. (2016). On secondary buyouts. *Journal of Financial Economics, 120*(1), 124-145.

Demaria, C. (2015). *Alignment of Interests of Fund Investors and Fund Managers in Private Equity.*

Demiroglu, C., & James, C. M. (2007). Lender control and the role of private equity group reputation in buyout financing.

Demiroglu, C., & James, C. M. (2010). The role of private equity group reputation in LBO financing. *Journal of Financial Economics, 96*(2), 306-330.

Dimov, D. P., & Shepherd, D. A. (2005). Human capital theory and venture capital firms: exploring "home runs" and "strike outs". *Journal of Business Venturing, 20*(1), 1-21.

Eisenhardt, K. M. (1989). Agency Theory: An Assessment and Review, 57.
Fang, Y., Wade, M., Delios, A., & Beamish, P. W. (2007). International diversification, subsidiary performance, and the mobility of knowledge resources. *Strategic Management Journal, 28*(10), 1053-1064.

Ghai, S., Kehoe, C., & Pinkus, G. (2014). Private equity: Changing perceptions and new realities. *McKinsey Quarterly*.

Goedhart, M., Koller, T., & Wessels, D. (2015). *Valuation: measuring and managing the value of companies*: John Wiley & Sons.

Gompers, P., Kovner, A., & Lerner, J. (2009). Specialization and Success: Evidence from Venture Capital. *Journal of Economics and Management Strategy, 18*(3), 817-844.

Gompers, P., & Lerner, J. (1996). Use of Covenants: An Empirical Analysis of Venture Partnership Agreements, The. *JL & Econ., 39*, 463.

Gottschalg, O., Loos, N., & Zollo, M. (2004). Working out where the value lies. *European Venture Capital Journal, 113*, 36-39.
Grant, R. M. (1988). On 'dominant logic', relatedness and the link between diversity and performance. *Strategic Management Journal, 9*(6), 639-642.

Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California management review, 33*(3), 114-135.

Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization science, 7*(4), 375-387.

Gupta, A. K., & Sapienza, H. J. (1992). Determinants of venture capital firms' preferences regarding the industry diversity and geographic scope of their investments. *Journal of Business Venturing, 7*(5), 347-362.

Hamel, G. (1991). Competition for competence and interpartner learning within international strategic alliances. *Strategic Management Journal, 12*(S1), 83-103.

Hammer, B., Loos, R., & Schwetzler, B. (2015). *Exit Through Exitus in Private Equity Buyouts.*

Ivashina, V., & Kovner, A. (2011). The private equity advantage: Leveraged buyout firms and relationship banking. *Review of Financial Studies*.

Jacobsen, D. I., Sandin, G., & Hellström, C. (2002). *Vad, hur och varför: om metodval i företagsekonomi och andra samhällsvetenskapliga ämnen*: Studentlitteratur.

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers*, 323.*

Jensen, M. C. (1989). Eclipse of the Public Corporation. *Harvard Business Review, 67*(5), 61-74.

Jensen, M. C. (1993). The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. *Journal of Finance, 48*(3), 831-880.

Kaplan, S. (1989). The effects of management buyouts on operating performance and value. *Journal of Financial Economics, 24*(2), 217-254.

Kaplan, S. N., & Schoar, A. (2005). Private Equity Performance: Returns, Persistence, and Capital Flows*, 1791.*

Kaplan, S. N., & Strömberg, P. (2009). Leveraged Buyouts and Private Equity*, 121.*

Knill, A. (2009). Should Venture Capitalists Put All Their Eggs in One Basket? Diversification versus Pure-Play Strategies in Venture Capital. *Financial Management, 38*(3), 441-486.

Ljungqvist, A., Richardson, M., & Wolfenzon, D. (2008). *The Investment Behavior of Buyout Funds: Theory and Evidence*. National Bureau of Economic Research

Lossen, U. (2007a). Performance of private equity funds: does diversification matter? *Portfolio Strategies of Private Equity Firms: Theory and Evidence*, 95-133.
Lossen, U. (2007b). *Portfolio Strategies of Private Equity Firms. [Elektronisk resurs] : Theory and Evidence*: Wiesbaden : Deutscher Universitäts-Verlag / GWV Fachverlage GmbH, Wiesbaden, 2007.

Metrick, A., & Yasuda, A. (2010). The Economics of Private Equity Funds*, 2303.*

Nikoskelainen, E., & Wright, M. (2007). The impact of corporate governance mechanisms on value increase in leveraged buyouts. *Journal of Corporate Finance, 13*, 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.

Phalippou, L., & Gottschalg, O. (2009). The performance of private equity funds. *Review of Financial Studies, 22*(4), 1747-1776.

Phalippou, L., & Zollo, M. (2005). *What Drives Private Equity Fund Performance?*

Sommer, C. (2012). *Private Equity Investments: Drivers and Performance Implications of Investment Cycles*: Springer Science & Business Media.

Strömberg, P. (2008). The new demography of private equity. *The global impact of private equity report, 1*, 3-26.

The Economist. (2014a). *Buy-in barons, 410*(8870), 75-75.

The Economist. (2014b). *Private equity: Barbarians at middle age, 410* (8879).

Tykvová, T., & Borell, M. (2012). Do private equity owners increase risk of financial distress and bankruptcy? *Journal of Corporate Finance, 18*(1), 138-150.

Wang, Y. (2012). Secondary buyouts: Why buy and at what price? *Journal of Corporate Finance, 18*(5), 1306-1325.

Zhou, D., Jelic, R., & Wright, M. (2014). SMBOs: Buying time or improving performance? *Managerial and Decision Economics, 35*(2), 88-102.