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Explanatory factors for operational improvements in European Buyouts

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Table 1 – Terminology & Abbreviations

EBITDA	Earnings Before Interest, Depreciation & Amortization. Often used as a proxy for the "raw" cashflow a company is generating
GP	General Partner, the individual that screens, selects and monitors the (potential) deals. He or she is mainly responsible for the overall deal flow
Hurdle Rate	Minimum required investment return before a project or investment would be chosen and pursued, usually in the form of an internal rate of return.
IRR	Internal Rate of Return, the discount rate that sets the net present value of the project equal to zero. It is the predominantly used as an investment metric to evaluate the performance of PE firms.
LBO	Leveraged Buyout, a purchase of a company in which usually a substantial amount of leverage is used.
Leverage	The amount of debt incurred in a buyout. Often expressed via a Debt/Equity ratio in the deal
LP	Limited Partner, the individual that provides the capital needed invest
MBO	Management Buyout, a buyout in which incumbent management buy a majority stake in the company
M&A	Merger & Acquisition, a buyout in which a firm is either acquired or merged with another company
PE	Private Equity, investing in private companies that are not publicly listed
VC	Venture Capital, a form of private equity, with emphasis on younger, riskier businesses

Chapter 1 – Introduction

1.1 Recent Private Equity Activity

After the 2008 financial crisis and specifically the 2012 euro crisis, overall interest rates have been at historic lows for quite some time with the German 10 year bond even offering negative yields since 2018 onwards[1]. Such low borrowing rates translate into relatively low credit spreads which has been argued to be one of the main determinants for leverage of companies and investment firms alike such as in private equity (henceforth: PE) or overall M&A deal volume (Axelson et al., 2007; Kaplan, S. & Stromberg, P., 2009; Baker et al., 2003). Not surprisingly, in recent years we have seen a steady and exponential proliferation in private equity activity, where overall European PE transactional volume has quintupled from the 2009 low of 82 billion euros, to 480 billion euros in 2018 (Pitchbook, 2020)[2].

Moreover, in the broader private equity-like industry venture capital (henceforth: VC) has seen significant growth as its economic importance has become increasingly recognized due to its ability to commercialize innovations and making ideas readily available for the market. The overall societal role of VC has become more pronounced as essential contemporary societal companies the like of Google, Amazon, Facebook, and WhatsApp are more often than not financed or helped in one form or another by venture capital firms, where 20% of all the public market capitalization in 2015 was funded by VC firms (Harvard business review, 2021).

Besides an increase in overall volume and societal prominence, we see a proliferation in the different deal types such as secondary buyouts and characteristics in the deals that are conducted. Such innovation is often interpreted as a signal of a new private equity cycles (Maisseneire, W., Brinkhuis., 2012). To name a few of such developments, we see an increasing interest in so-called "co-investments", where general partners offer investments outside their regular fund to limited partners, thereby avoiding carried interest, and arguably improving relations to those offered such opportunities (Braun et al., 2020). Next, with globalization evermore continuing to expand its horizon and the passing of time with respect to the European integration efforts, we are witnessing a rapid rise of cross-border deals throughout Europe with 75% of all deals containing international participations, where the overall percentage of global deals exhibiting such deal type rose to 31% in 2010 (Aizenman et al., 2008 ;Bloomberg, 2010). More specifically, we are witnessing an increased interest of intercontinental parties entering the European private equity market with countries like the United States and China as significant regional forces driving this trend.

[1] http://www.worldgovernmentbonds.com/bond-historical-data/germany/10-years/
[2] https://pitchbook.com/news/reports/2020-annual-european-pe-breakdown

Alongside traditional private equity, buyouts in Venture Capital has likewise seen an increase in activity and impact on overall society ever since the late 1990s crises where a significant amount of skilled VC and PE human capital transferred from the United States to Europe, which ultimately laid out a rich foundation for future investments of this sort. Around 20 years later, as in the surge of PE, we have analogously seen a significant expansion of VC, where in 2006 till 2019 alone overall European deal volume nearly ten-folded from 3,8 billion to over 37 billion euros. (Pitchbook, 2020)[3].

With aggregated committed capital having nearly ten-folded since 2010, the PE industry has increasingly experienced a need to allocate such a quantity of funds (Pitchbook, 2010). This has led to an increasing number of funds diversifying across geographic location as well as industry. By spreading their eggs in several baskets, one could argue that running the joint risk in different business environments is significantly lower as opposed to holding both investments in each regions separately. Furthermore, by diversifying, certain industries or regions might enjoy a significant diffusion of knowledge of managerial skill and know-how. As such, we have ultimately seen an emergence of diversified funds that can be chiefly subsumed into funds that diversify across region and those that do so across industries.

Moreover, after the negative shock of Covid-19 to the economy, we see overall M&A and deal activity continue to be picking up its formerly lost pace[1]. Most industries however, have yet to fully operate back to their respective capacities and original economic equilibria. Despite this, we find that the pricing of overall capital investments are at near all-time highs. With financial markets, VC, and PE deal activity at historically unprecedented levels, where global deal volume exceeds 430 Billion dollars, a 150% year on year increase[4], and with the highest amount of annual initial public offerings on the U.S. financial markets being solely attributable to the first 6 months of 2021 (Financieel Dagblad, 2021). This ultimately raises the question for how long such developments might continue, and more importantly: could these signals be interpreted as whether we are situated in an overheated private equity market or not.

Therefore, to guide us in such questions, this paper aims to revise previously established relationships in private equity, whilst synthesizing more recent private equity developments and deal innovations to provide an overall framework one can use to assess what drives overall private equity performance. Where the latter is approached through a multitude of perspectives such as operational, fund level, and deal characteristics across European buyout and fund datasets.

[3] https://pitchbook.com/news/reports/2020-annual-european-venture-report?utm_medium=nl-na&utm_source=reports&utm_campaign=2020-annual-european-venture-report
[4] https://stockanalysis.com/ipos/statistics/

1.2 Problem

Now whereas the main focus of PE research has initially been dedicated to American continent and on returns, its European counterpart has had a significant proliferation of published academic articles on a wide range of PE dynamics, beyond investment returns. Within the subject of private equity and venture capital, such past research has indicated how essential governmental and institutions can be for overall PE activity and how institutional or legislative differences between countries can have a significant effect on the structure of deals, deal performance (both operational and fund level), and aggregated capital flows (e.g. Aizenmann, Kendall, 2008; Holloway, Lee, Shen, 2016; Jeng, Wells, 2000). Research on private equity in Europe is thereby a fruitful endeavor as many of these established relationships have yet to be affirmed in the European region to the same degree as they have been the American continent.

Moreover, as most Private Equity activity tends to be cyclical, each academic article in different time horizons could offer unique and profound insights due to the changing dynamics that characterize the industry. To name a few of such innovations one can think of the rise of using subordinate or mezzanine debt in the second PE wave of the 1990s, or where we see that contemporary European funds tends to utilize more tranched debt, where secondary buyouts are becoming increasingly popular (Demiroglu, James, 2010; Axelson et al. 2007). Reflecting on the current time horizon, we are similarly experiencing unique stimulative dynamics that on a historical basis have been present in the overheated buyout waves such as the low credit spreads, negative interest rates, and excessive governmental lending. Furthermore, private equity and venture capital activity is booming with an analogue increase of financial innovation in the deals forms and structures such as refinancing, secondary buyouts, and even partial or two-step sales of equity stakes (Cumming, Siegel, Wright, 2007).

Research on such matters however, has been rather limited due to the inherent opaque nature of the investment form which tends to manifest itself in difficulty of obtaining the relevant information and deal-data as most firms and deals are not obliged to any disclosure as the name private equity might suggest. These informational and data transparency issues are further enhanced when looking at the European region where the overall PE market is less developed as a whole, whilst simultaneously being spread over different countries with each differing in supervisory institutions, legal frameworks and governmental bodies.

As mentioned above, the financial markets are currently in a strong boom where the overall price for underlying earnings for most capital investments is currently trading at relatively high levels, with the S&P 500 having an inflation adjusted Price/Earnings ratio 38 as of July the second in 2021, doubling

the historic mean ratio around 16[5]. Moreover, where the Covid-19 pandemic can be largely blamed for declining profits of corporations, the savings rates in most western-countries have surged to unprecedented levels largely due to the pandemic as a result of declining expenditure opportunities as most in person entertainment, travelling and leisure were forced to close their doors temporarily. This increase in savings rate and the booming financial market gave rise to retail investors willing to invest, where technological innovation via trading platforms the like of Robinhood significantly reduced the threshold to do so.

All the aforementioned forces stimulate investing either directly or indirectly, as through the savings accounts of banks or higher deposits in pension funds. With most of the relevant literature indicating a strong negative relation in aggregate fund flows and performance (Kaplan, Schoar,. 2015), the question is thereby raised whether one is overpaying or running a higher risk than traditionally expected when committing such capital into private equity.

Moreover, PE Firms are increasingly becoming more embedded in investing and society as a whole as it appears to have even become a vehicle of choice for national investments through pension funds with 63% of pension funds in Europe having a dedicated PE department, and an increasing participation of sovereign wealth funds in Buyouts, making it seem that the state has understood the benefits Private equity has to offer[6]. Thereby the argument of private equity being exclusively for those of higher socioeconomic status appears to slowly lose its foundation, where the future outlook appears to be vested in a more ingrained societal investment position.

The aforementioned overheated financial market and increasing societal prominence of private equity ultimately stress the importance of understanding the characteristics that are relevant when evaluating a potential PE deal and where the value creation of a buyout lies. With most academics evaluating the buyouts via an investor's perspective of returns, this papers aims to take an operational angle where the likelihood for and the size of operational improvements in buyouts are investigated. More specifically, this paper aims to scrutinize which characteristics of a deal tend to be beneficial for a positive operational outcome of a deal and answer how come so. The paper shall synthesize the newer trends in PE, such as offering co-investments and engaging in cross-border deals, to a broader investigative structure as largely constituted by previously established relationships in private equity, main. This question in turn questions whether the established relationships for returns analogously

[5] https://www.multpl.com/shiller-pe/table/by-year
[6] https://www.investeurope.eu/media/1222/invest-europe-pension-fund-guide-to-private-equity-and-venture-capital.pdf

explain observations for operational improvements, such as whether the historic persistence of top performing funds are an ongoing story that can continue to be told in the industry.

1.3 Central Research Question

Having described the current landscape of private equity, this then brings us to the main research question of this paper: what are the effects of the recent trends we see in private equity on the overall operating performance of a deal? In order to evaluate this question, various perspectives and characteristics of deals are analyzed through several hypothesis that aim to elaborate specific aspects of private equity performance qua fund level returns as well as through the typical operational improvements that are exhibited in a private equity deal.

Relevant factors for the success of leveraged buyouts have seen evidence for informational asymmetries and superior human capital or management practices between the target and acquiring firm (e.g. Meuleman, Wright, 2011; Demiroglu et al., 2010; Humphrey-Jenner et al., 2017; Fang et al., 2015; Acharya et al., 2013). Cross-border deals however, intuitively face greater obstacles to overcome as PE managerial skillset has yet to be adjusted to the legal, cultural, and work setting of the domiciles of the target corporations. To overcome such adversities, local partners are often utilized to reduce the informational gap between the target and foreign acquirer. As such, the following sub-question is formulated: Do cross-border deals perform worse than its local counterparts and does a local partner enable the foreign acquiring firm to obtain better results?

In line with the informational perspective, we find that incumbent management in management buyouts (Henceforth: MBO) experience superior informational advantage over the targets whom they buy the company from. Moreover, we find that different deal types differ in their motivation to engage in them, resulting in different operational improvements that are made, where for example strategic deals might not exhibit much operational improvement. Therefore, the empirical question is investigated whether MBO's experience greater operational improvements versus other deal-types.

Lastly, identifying key transactional characteristics is of major importance as persistence of performance appears to be a recurring occurrence in private equity. Similarly, human capital and experience are often brought forward as arguments for explaining performance. Moreover, larger PE-firms appear to benefit from more access to capital and lower debt spreads, whilst being able to spread investment risk across regions and industries which theoretically has the possibility to enhance fund returns if diversified accordingly. Furthermore, co-investments arguably offer increased access to capital whilst increasing the assets under management. However, diversification and size in itself does

not warrant increased performance as the fund might not be able to replicate the competitive advantage one has in their field and additionally spread resources too thin. As such, the following sub-questions shall be analyzed: To what extent does firm size and reputation matter for deal-performance and does offering co-investments improve the latter? Subsequently, does diversification across industries or regions on the fund level affect the operational improvements of the respective acquired target firms?

1.4 Ethical Issues & Research Limitations

1.4.1 Informational problems

Despite the aims of the research, the inherent opaque nature of private equity and the relatively wide scope of this paper make it troublesome to truly dissect effects between certain traits of deals or funds on overall performance in the industry. This entails that most information that is used when conducting such research is firstly quite difficult to come by, and second, difficult to verify. The common survivorship bias in PE datasets, where poorly performing funds are underreported, is likely to play a role as well as the incentives are strong to solely report positive results. Nevertheless, the PE fund database Preqin was used to minimize fund performance as it appears to be relatively unbiased when compared to other sources such as Thomson (Harris et al. 2014).

1.4.2 Broad Scope

As previously mentioned, give the broad scope of this paper, establishing and reinforcing specific relationships between the variables of interest and operational performance is a difficult task as not all variables of previous research but mere proxies were available. This entails that the presented tables and regressions will not be as specified for establishing past relationships as such when compared to the analyses of the peers in the relevant literature. However, this paper could still guide the necessary research framework when conducting an analysis on private equity or a buyout. This is in line with the main aim of this paper to summarize the findings of the past literature on the recent trends in private equity, whilst creating indictive sketches via newer datasets on the previously established and possible new relationships. Further insights on such analytical limitations and possible avenues for future research and improvements are presented in segment 5.5.

1.4.3. Ethical issues

The ethical implications are closely connected to the interpretation of the outcome of the research as overall indications on industry trends and developments are given. When presenting such a top-down framework, it may induce stronger requirements in forms of arguments for certain participants in the industry when a certain fund or deal would opt for a conflicting choice that runs against the exhibited

framework and findings of the literature. I do not have any of such intentions as this paper merely aims to emphasize the conclusions of past literature and sketch out how an overall deal of a fund can be analyzed via deal- and fund-level perspectives with their relevant explanatory variables.

1.5 Chapter Descriptions

Having introduced the topic and broad perceptions in the field, the rest of the paper is structured as follows: in section 2 we start with a discussion of the relevant academic literature to gain the fundamental insights from which we shall draw our hypotheses to answer the central research question. Next, in section 3 the hypotheses and data are further elaborated upon from which an overall methodology is construed and presented. Thereafter, in section 4 the outcome of the analysis shall be presented and interpretations of the results are given and compared with the literature findings. In section 5 we compare the main findings of the literature with our results and subsequently the presented hypotheses shall either be refuted or accepted, whilst reflecting on the main research question to ultimately investigate which factors are relevant when analyzing cross-border private equity deals.

Chapter 2 – Literature study

In order to analyze the relevant factors on operational performance we shall in this section examine the previously established relationships and effects that surround the respective deal or fund-level characteristics. From this foundation several hypotheses are drawn that are relevant for answering the central research question. Lastly, an overall conceptual framework is presented with the aim to enhance the comprehensibility of the conducted analysis.

2.1 Literature Study

2.1.1 Cross-Border Deals

In recent years, we have seen a proliferation of cross-border PE deals, where formerly the percentage was around 15%, since 2007 we see that more than 40 percent of the worldwide PE deals are cross-border (Aizenman, J & Kendall, J., 2008). In Europe specifically, it appears that cross-border deals are the norm as 75% of transactions involve an international player that partakes in the deal process (Bloomberg, 2010). With such cross-border deals often involving companies originating from countries with well-developed VC/PE markets like the United States and United Kingdom, as they sought for investments and business opportunities outside their domicile due to increased capital flows. Whereas such deals have become increasingly popular, they are however arguably harder to execute successfully due to the associated extra transaction costs and informational disadvantages that need to be overcome in such a deal, which shall be outlined further.

Most literature on the subject finds that cross-border deals undergo serious drawbacks that domestic investments do not, namely higher transaction costs, significant informational asymmetries between the investment and target firm, and higher monitoring costs when the investment ultimately has been made (Holloway et al. 2016; Dai et al. 2012; Jeng, Wells, 2000; Humphery-Jenner et al. 2017). Moreover, Aizenman and Kendall found in 2008 that relevant factors for cross-border deals between the firms are having colonial ties, a developed business environment and financial market, distance, high-end human capital, and a common language (Aizenman et al., 2008). All of the former considerations suggest that the previous adversities mainly pertain to informational asymmetries and can hence be overcome via local expertise or having experienced human capital.

Thereby to overcome such matters, private equity firms have a tendency to seek partners or peers internationally to help overcome these additional costs or informational deficiencies via local industry know-how spill-over, sharing management expertise, as well as proficiency in operating under different constitutions (Meuleman, Wright, 2011). Dependency on local partners however is likely to be reduced as the amount of portfolio managers, experience in target country, and number of conducted cross-border transactions increases. Furthermore, such syndications have proven to be

exceptionally fruitful for the VC and PE industry firms where the likelihood of survival and Internal Rate of Return (IRR) increase significantly when incorporating external firms in the deal (Hochberg et al., 2007). Additionally, they find that there is a strong preference for working within your network as opposed to conducting spot market transactions at-arm's length, further stressing the importance of network effects in VC and the broader PE market.

Next, overall private equity activity appears to be strongly positively related to countries that have high creditor rights, which is intuitive given the large sums of debt involved in such transactions and that warranty for debt holders is therefore desired, with the United States being a unique outlier (Cao et al., 2015). More importantly, they find that cross-border deals primarily flow from strong to weak creditor right countries and that PE firms seek to protect themselves from possible inefficient legal protections in cross-border deals via using several partners in club or international deals.

Overall then, the aforementioned costs and information asymmetries suggest that cross-border transactions are on average likely to underperform their domestic counterparts, all things equal, when no initial measures have been taken to overcome the deficiencies. To see whether these relationships then still hold in the contemporary M&A industry, the following hypotheses have been developed:

H1a: cross-border transactions are more likely to exhibit worse operating performance of the target firm and on average underperform domestic deals when measured via differences between pre- and post-deal metrics

H1b: The usage of local partners or other firms reduces the likelihood of a negative operating performance of the target firm and enhances the and post- deal financial metrics

2.1.2 Management Buyouts

Private equity confirms to a wide array of type of buyout deals. One of which is known as the so-called management buyout. In Kaplan's seminal paper of 1989 he argues that management buyouts offer a multitude of benefits in comparison to other traditional investment types. Main benefits can be found in reduced agency (monitoring) costs, superior inside information known by management, and most importantly: aligned incentives between management and ownership (Kaplan, S., 1989). He finds that management buyouts experience significant cashflow improvements, which are not driven by divestures, and are correlated to market returns.

Moreover, when the incumbent management does take over the firm, not only are the incentives between agent and principal arguably more aligned, but the informational advantage could also be negatively interpreted as management would have the opportunity to manipulate past earnings so that the firm can potentially be bought at a lower overall price at time of purchase (Perry, Williams,

1994). This formerly however has not been argued to be the case when scrutinized by Kaplan and others, in 1989 as incumbent management would not opt for a larger equity stake in the deal. (Kaplan et al., 1989).

Where most buyouts are analyzed via overall returns as often measured through IRR or TVPI, management buyouts on the other hand appear to be more organically driven, where the operational side of the firm is mainly enhanced via reducing excess personnel and maintaining strong operational margins (Harris et al., 2005). Additionally, these operational improvements often manifest themselves via an increase of cashflows via improved working capital management following the years after the management buyout, whilst constraining their influence on corporate expenditures due to the constraining function of debt (Smith, A. J., 1990).

Moreover, in contrast to Perry and Williams, Smith argues twofold that incumbent management does not act upon informational advantage at the time of the deal. First, he finds that externally threatened buyouts performed equally well than non-defensive buyouts, showing no difference between insider and external initiated deals. Second, firms in which management experienced a rejection by the board or shareholders for the buyouts did not experience a subsequent increase in operational performance after the offer. However, via the aligned incentives perspective one could argue in the latter that incumbent management would be less willing to act upon the supposedly superior information.

In sum, there can be arguments found for increased operational emphasis in a PE deal characterized as a managerial buyout due to the possible intuitive informational advantages and superior aligned incentives such deals exhibit. To analyze whether such arguments still manifest themselves in the associated operational improvements we compare management buyouts to regular buyouts in recent private equity deals as we formulate the following hypothesis:

H2: Firms that are subject to Management Buyouts have stronger cashflow increases than non-MBO deals as measured via differences between pre- and post-deal cashflow metrics.

2.1.3 Co-Investment Funds

In recent years there has been a proliferation in the frequency of so-called “co-investments”. These are private equity deals in which the GP offers a deal to the LP outside of the traditional firm structure, thereby avoiding the associated 2-20 “carry” costs. These deals have particularly become popular after the reduced popularity of club deals between PE firms, which resulted after a Security Exchange

Commission initiated a lawsuits against a club deal for alleged collusion[7]. Academics however have argued that despite the initial adverse effect of such a transaction via missed earnings, there are clear associated benefits such as an increasing exposure to industries, syndication benefits, the diffusion of knowledge, and pooling of correlated investment signals between the parties, where the overall benefits are more pronounced in Venture Capital deals (Hochberg et al., 2007).

One could argue however, that given the different payoffs for GP's between traditional deals and co-investments, there is a possibility of cherry-picking and adverse selection in the latter (Fang et al., 2015). This however does not appear to be the case when later scrutinized by Braun et al. in 2020, where they find that there is no significant difference in returns between co-investment and conventional investments. Moreover, they argue that such deals strengthen the relationship between LP and GP and that PE firms therefore are not willing to sacrifice their reputation for short-term profits, emphasizing the benefits of network effects that strongly resonate in the industry. More interestingly, they find that co-investments on average outperform their full-fee counterparts after taking the carried interest into account, yet also warn that this would only manifest itself on average after having constructed a sizeable portfolio of such transactions.

Now then, to see whether offering co-investments in the fund subsequently benefits the deals that are undertaken, we investigate whether funds that offer such investments outperform their peer investment firms via operational improvements. The following hypothesis is formulated to investigate the previous inquiry.

H3: Deals by funds that offer Co-investments are more likely to exhibit operational improvements than other firms that are not backed by such funds

2.1.4 Fund Specialization & Diversification

Another prominent area of interest for explaining performance in private equity lies at the heart of specialization of the fund as human capital and resources are limited, where specific know-how & networks in industries and institutional settings are essential to identifying and closing deals successfully (e.g. Fang et al., 2015; Meuleman, Wright, 2011). It therefore naturally follows that a sizeable amount of funds have arisen that specialize in certain industries or fields in order to capitalize on their proficient internal human capital that is tailored to the knowledge of respective sector. This is in line with research by Acharya among others in 2013, where they found that firms with employees tailored to industries (via management consulting as opposed to finance), mainly yield internal operational improvements, where non-specialized finance personnel yielded better multiple returns (Acharya et al., 2013). This suggests that expertise in an industry offers better respective managerial

[7] https://www.reuters.com/article/clubdeals-lawsuit-idUSN2325594620070823

services due to less informational asymmetries and fewer principal-agent related issues than non-specified funds (Lossen, U. 2007). This was further reinforced as industry specialization by the PE-firm proved to enhance the operating profitability of the acquired firms (Cressy et al., 2007). Below are two key specialization trends that can be ascribed to the PE industry.

First, we see an increasing presence of funds that are diversified across industries. Whereas such diversification might hurt non-investment companies in performance due to cross subsidizing and overinvesting in poorly performing business units, companies that expand in industries with relatively similar knowledge traits are able to obtain the diffusion of knowledge or even economies of scale or scope (Miller, 2006). In private equity, similar trade-offs might be at stake as industry diversification can enhance knowledge sharing between portfolio companies and managers, and more importantly stimulate managerial risk sharing (Humphrey-Jenner, M. 2013; Lossen, U. 2007).

Second, and in line with the emerging global presence of PE activity worldwide, a tendency has arisen that PE-firms no longer exclude their investments to their local region as cross-border and even cross-continental deals are becoming a frequent occurrence. Main benefits of geographic diversification lie in obtaining less volatile returns for PE fund due to ameliorating effects when economic and market conditions change, where in economic booms performance is enhanced and during economic busts there is the possibility of a dampening effect on lower performance, where experience in the expanded segment is crucial for performance (Bowden et al. 2016). Other literature on the other hand, does not indicate that regional diversification in itself will enhance fund returns (Lossen, 2007). Moreover, diversification might enhance overall networking effects for the firm, which is of vital importance in venture capital-like in and overall deal flow and subsequently overall performance (Hochberg, Ljunggvist, 2007). Additionally, better performing funds find it easier to enter foreign countries due to their reputation and profile and therefore have a broader availability of investment opportunities which is proven to be fundamental for investment performance (Holloway et al. 2016)

Not all seems bright however, as PE diversification can still come at a cost as management has to adjust to the new business environment the fund has just expanded into. In line with this, it was found that the interaction effect between regional and industrial diversification might result in an increase of transaction costs such as fundraising, marketing, and logistical costs. (Hitt et al., 1994; Jones, Hill, 1988). Moreover, as private equity is a knowledge-intensive field, most competitive advantages lie in superior information processing proficiencies where an expansion to a relatively similar knowledge-field or geographic area does not necessarily warrant the successful replication of the advantage in the newly obtained focus (Hitt et al. 1997).

Moreover, most academic research on the industry has been conducted on the fund level, where fund diversification on individual performance of deals has yet to be analyzed to the same extent. This in turn begs the overall question whether the acquired target firms in deals similarly benefit from being backed by a diversified PE-fund due to the aforementioned characteristics or whether tailoring to a specific industry or region is more likely to enhance the operational improvements. Then, to analyze whether diversification not only benefits the fund and investment itself, the following hypotheses are drawn:

H4a: target firms that are backed by industry diversified funds exhibit greater operational improvements than those that are backed by industry specific deals.

H4b: target firms that are backed by geographically diversified funds exhibit greater operational improvements than those that are backed by industry specific deals.

2.1.5 Fund Size, Reputation and Persistence

When looking at the size of funds on performance, there appear to be two main effects at stake: First, better performing funds are likely to attract more capital (e.g. Kaplan, Schoar, 2015; Kaplan, Stromberg, 2009; Achleiter et al. 2010); Second, as aggregated invested capital increases, performance is likely to go down due to the limited availability of investment opportunities and increasing supply of capital, thereby subsequently stimulating higher valuations and pricing of PE deals due their respective overall increased demand (Kaplan, Schoar, 2015; Gompers, Lerner, 2000; Harris et al. 2014). In practice and as reported in most academic papers, the latter appears to crowd out the former, which suggests that diseconomies of scale are at play in the private equity sector (Humphrey et al. 2007). Moreover, larger funds are on average better equipped to engage in deals of greater magnitude due to their superior fundraising capabilities and also confirmatively appear to be more proficient in them as their smaller deals fared significantly worse than their largest deals (Humphrey-Jenner, 2012).

Given that private equity is a knowledge intensive field, it is of essence that human capital is used accordingly to optimize overall returns and performance of the fund, without a detrimental increase of interaction-effect costs such as communication, information processing or border-related costs (Lopez et al. 2015; Holloway et al. 2016). Academics have remained relatively inconclusive with mixed results on the effect of fund size on performance, until the seminal paper of Lopez among others in 2015, where they found that the amount of concurring deals and held investments is strongly negatively related to performance, stressing that funds should be wary to not spread resources too thinly (Lopez et al. 2015).

More importantly, in private equity there is a clear positive relationship between past fund performance and upcoming fund performance, which is known as persistence of returns, signaling that

certain funds exhibit a clear competitive advantage (e.g. Kaplan, Schoar, 2005; Demiroglu, C., James, C. M., 2010). This in turn is partly reinforced by the governance of funds themselves as after a period of good performance they tend become more conservative to preserve their track record, where younger funds appear to be more willing to take on risk in an attempt to capitalize on the opportunity to kickstart the fund by establishing a strong track record (Ljungqvist et al. 2017). Furthermore, the improved reputation and human capital due to past performance is likely to drive down the cost of debt in future buyouts and increases access investment opportunities, further enhancing future returns and adding signaling value (Dimoroglu, James, 2010; Kaplan, Schoar; Humphrey-Jenner et al., 2017).

It then becomes apparent that there is not one clear indicator that triumphs and enhances overall PE deal performance as there are several significant dynamic and contradictory factors at play. To analyze then how the PE-fund size, performance reputation, are likely to enhance the individual acquired target firm operational improvements, the following hypotheses are drawn below:

H5a: target firms that are backed by larger funds exhibit greater operational improvements than those backed by smaller funds.

H5b: target firms that are backed by funds that are in higher quartile rankings of performance, exhibit greater operational improvements than those backed by lower quartile ranking funds

2.2 Conceptual Framework

For comprehension purposes, a conceptual framework is presented in figure 1 below, with the aim to visualize the aforementioned investigated effects and underlying relationships that shall be scrutinized in the latter section of the article. Moreover, one can find a subtext explaining the rationale of the constructed hypotheses to guide the respective outcomes towards answering the central research question.

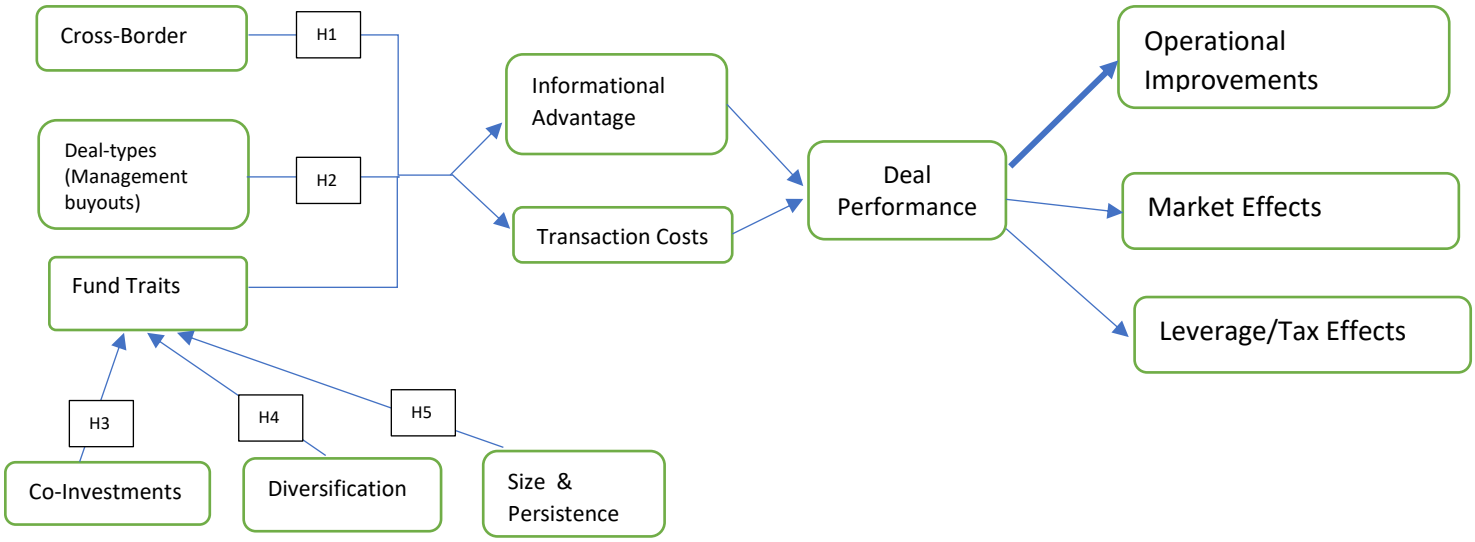

Figure 1: Conceptual Research Model

First, we expect cross-border transactions to be negatively affected by experienced informational asymmetries and increased transaction costs, which in turn can be possibly be overcome by using a local partner. Second, leveraged buyouts that are classified as management buyouts exhibit greater operational improvements than other deal-types due to the informational superiority and influence incumbent management has over the firm preceding the buyout. Third, Co-funds that allow for co-investments exhibit on average deals of greater operational improvements due to network effects and associated benefits such as knowledge spill-over and building goodwill with clients. Fourth, diversification in private equity is analyzed if it subsequently increases the acquired target firm's operational performance as it is known to increase overall fund returns due to the arguably availability to cross-market knowledge, diffusion of managerial know-how, and benefits from positioning in different economic markets. Lastly, we are interested what fund size and past performance entails for future deals, better performing funds attract more capital, where there are only a limited amount of investment opportunities despite now having more resources at disposal.

Chapter 3 – Methodology

3.1 Dataset

To investigate the main research question we require two types of datasets on both fund level performance and direct deal-level data to yield an answer. An persisting problem in private equity research is however that the data tends to be subjective to survivorship or backfilling bias. In the former there is a tendency for only good firms to survive as the worse performing deals are no longer listed[8], whereas in the latter the funds wish to be put on the list after years of good performance[9]. To mitigate this, the database of Preqin was chosen for fund-level data as it appeared to less subjective to such biases or inadequacies when compared to peer databases like Thomson (Harris et al. 2014). Furthermore, the dataset offers profound insights on persistence and the size of the funds as they publish performance quartiles based on internal rate of return, whilst also displaying the size of the respective fund via total called in capital.

Moreover, to obtain the individual deal-level information the dataset of Zephyr was used, which is a comprehensive M&A deal dataset in which extensive company characteristics and financial metrics are stored. Zephyr was chosen as it appeared to contain a significant amount of deals for the respective years, totaling 1578 deals over the period after applying a filter, whilst also displaying comprehensive information on both target and acquiror companies. This information is particularly useful as it highlights essential target firm financial information that is most recent prior to and after the completion date of the deal. Due to the vast amount of information available and structure of the dataset, zephyr is particularly appealing for as it enables one to swiftly modify data or create new variables via syndication in the dataset.

3.2 Sample

Most Private equity research surrounding the central research question was conducted with samples consisting of periods prior to 2013 and sometimes even before the millennial change, where arguably quite different financial sentiments, risks, and returns accompanied the respective time periods. Moreover, as private equity waves tend to be accompanied by financial innovation (Maeseneire, Brinkhuis, 2012), there is an inherent need to verify previously established relationships to reinforce, emphasize and document how certain private equity deals fared when subject to such different business environments and cycles. Therefore the time period of 01-01-2013 till 01-01-2020 was chosen to mitigate major financial periods of economic volatility and increased probabilities of financial risks

[8] https://moneyterms.co.uk/survivorship-bias/
[9] https://fincyclopedia.net/hedge-funds/b/backfill-bias

such as the 2008 financial crisis and 2012 euro crises, and also more recently the 2020 Covid-19 crisis. Moreover, this time period was opted for as appeared to be a lesser area explored in research as most used datasets go up to 2012. Lastly, this period appears to be quantitatively substantive as the transactional volume of deals has rebounded from and even surpassed its pre-2008 levels, thereby containing sufficient European buyout data to perform a regression or a comparable extensive analysis.

Given the wide range in types of deals in both databases, a precise filter or criteria list was applied to each, and they can both be found in the appendix section of the paper. In short, we restrict the Zephyr sample to European private equity buyout data via the additional requirement that a deal contains both the pre- and post-deal target EBITDA and revenue values as these are the main chosen variables of interest when looking at cashflow improvements of the firms. For the Preqin dataset, we again filter for European funds, for which the quartile rankings, diversification or specialization, and fund size were known for. Moreover, as we are interested in both fund and deal variables, we synthesize both datasets to create one large dataset wherefrom a sample was taken to thereafter run several regressions and linear probability models on. In the section below we shall further highlight how this synthetization was done.

3.3 Data Modification

To construct the overall dataset that was used for the analysis, both datasets were aggregated into one by matching the deals accordingly via the respective acquiror funds so that both target firms and investment funds that appeared in both Zephyr and Preqin were displayed with both the relevant deal-specific and fund-specific characteristics. This was done by matching the name of the acquiring fund with the Preqin database, where subsidiary funds were checked for the name of the global ultimate owner as well, and by ultimately matching their most suitable fund based on the corresponding geographic preference, target firm country, inception date & deal date, fund strategy, deal type, and subsequently fund & deal size.

Moreover, extra columns were created with metrics such as EBITDA/Assets, Revenue/assets, originating from the zephyr Pre- and Post-deal information on EBITDA, Revenue, and Assets. Columns containing binary values “Revenue increase “ and “EBITDA increase” were created on the aforementioned metrics, where the value “1” was taken if the metric had increase and “0” otherwise. Moreover, the variable cross-border was created which exhibits “0“ if the deal was solely conducted between two parties in the same country, and takes the value “1” otherwise. Next, the variable inter-continental deal was similarly created with the value 1 if either of the parties in the deal was located

outside of the European region. Similarly, the metric local_partner_used was created if the deal was a cross-border deal and in the acquiror group a firm was present from the target home country, where the value is 1 if such a partner was present and 0 otherwise. Next, the deal type and subtype was adjusted into categorical variables, devoid of the percentages and so-called "stake increases" that are present in the dataset. Such Stake increases were considered as a separate variable in itself, where a deal with such a characteristic obtains the value 1 and 0 otherwise.

Lastly, if fund data level was not sufficient to obtain a match yet the acquiror was still a private equity firm, then the information from the corresponding funds were obtained via palico.com or via the site of the respective firm where unfortunately only the size of the fund, inception year, and an indication for strategy and geographic presence was available, thereby lacking much of the useful Preqin information.

3.4 Scientific Test

In order to test the hypotheses, we opted for a quantitative method of analysis as we are not only interested on the effect of the variables and their direction in outcome, but also in the magnitude of the effect. Therefore, as mentioned above, a regression shall be used as it enables us to both quantify the impact of the interested effects whilst controlling for various of variables and time-variant effects such as industry of target firm and business cycles via years to ultimately pinpoint what the effect of one specific regressor is on the regressand. Moreover, a linear probability model is construed with a binary dependent variable for operation improvements as such a model enhances the intuitiveness of the outcome and could yield new insights regarding probability of improvements.

To conduct the regressions, several variables were used that deemed relevant for private equity fund performance in the literature and subsequently for the supposed operational improvements that are accompanied with it. To investigate the latter, our main variables of interest —independent variables— are the EBITDA/asset and revenue/asset increases between the pre- and post-buyout data of the target firms as buyouts focus on cashflow improvements and market growth to overcome the incurred leverage (Matthews et al. 2009). Moreover, closely resemblant variables called EBITDAAssetsIncrease and RevenueAssetsIncrease were both created and set to 1 if the difference in the dependent variable metrics were positive and 0 otherwise. From these binary variables a linear probability model was built were from which marginal effects were calculated to display the likelihood of operational improvements given the independent variables.

3.5 Reliability & Validity

When using a regression-style analysis however, several assumptions are underlying the methodology that are needed for a valid analysis. The most essential presumption is called endogeneity which entails that the independent variables should not be correlated with the error terms so that all factors area accounted for and therefore produce a consistent and reliable coefficient for the independent variables. A violation of this assumption is not testable however, and therefore to account for this issue, a sizeable amount control variables have been added such as country, industry and year of the respective deals, to improve the specificity of the variables of interest. All control variables can be found in table 6 in appendix where additionally all regressions and linear probability models are displayed.

Furthermore, several of the included variables might have an (in)direct relationship with each other and thereby exhibit multicollinearity as, making it harder to pinpoint one precise effect of one variable on the outcome. The literature for example, has indicated that capital flows and return performance (Kaplan, Schoar, 2005), or using a local partner and engaging in a significant cross-border deal (Meuleman, Wright, 2011) exhibit a clear relationship. To overcome such matters, extra robustness checks such as Variance Inflation Factors were conducted across all independent variables, where inferior variables qua economic argument and high variability with relatively little significance were omitted. Moreover, the standard errors were clustered on the target firm's Sector, as opposed to year, as economically PE operational improvements differ per industry and it reduced the most variance in the residual errors of the model. (Kaplan, Schoar, 2005).

Lastly, as pre- and post-deal data of zephyr do not display a specific time or date, we are not certain from which year or month these values date. Hence, an additional step on verifying the data via Orbis was taken: The respective values of 100 deals in the zephyr data of the target firms were collected and compared to the Orbis data, where the average deviation from the deal completion date in years was taken. The results can be found in table 4 of the appendix and a that on average the pre- and post-deal data does not exhibit spurious observations, averaging a deviation of 1,13 years prior to 0,48 after the completion date. Thus, the average periodic difference between pre- and post-buyout data is to be approximated by 1,5 years.

3.6 Limitations

There are several limitations in the data and methodology however, that could hinder the interpretation of the overall outcome. One such limitation follows our last paragraph on validity in the presented pre- and post-deal variables as they are based upon first available financial annual year data,

entailing that we are not able to judge how long this pre-and post-period year would be available. As Smith noted in 1990, performance measurements are larger when the time periods are larger between pre and post- buyout data. This ultimately could limit the interpretation of the results as we are not able to verify the precise years of the data. For validity, a small sample was taken and juxtaposed with the relevant Orbis data of the target firms surrounding the completion date of the deal. Overall the numbers appeared to be mostly in line and no significant anomalies were found.

Another flaw lies in the possibility of endogeneity the regression, as we are unable to verify that we have accounted for all relevant variables for the regressand. One example was brought forth by Hemphrey-Jenner and others in 2013, where they outline that cross-border deals could be prone to a higher set hurdle rates to compensate for the higher uncertainty in transaction costs and informational asymmetry (Hemphrey-Jenner et al., 2013). This in turn can create a strong upward bias on performance, making it appear that cross-border deals on average perform better, ceteris paribus, yet local deals that exhibit identical deal-characteristics would in fact not be comparable due to the higher set hurdle rate.

Moreover, as mentioned in section 1.4 ethical issues & research limitations, given the broad scope of the used literature, and the syndication of information in both datasets, we were not able to control for all variables that deemed relevant in the respective literature of the independent variable of interest. In section 5.5 Recommendations to Future Researchers, I shall further elaborate on the possibility of which key variables were missing that were on the contrary brought forward in the literature and how they could be implemented to further pinpoint the effect of the independent variables on the dependent variable when conducting research following this paper.

Chapter 4 – Outcome

When reflecting on the central research question, we find that we were mainly interested in variables of both fund- and deal-level of the individual buyouts as presented in the conceptual framework segment. This section shall be structured accordingly, starting with highlighting the key control variables to establish an intuition for evaluating operational improvements in PE deals, whereafter the second segment is dedicated to deal-level and fund-level characteristics as presented via the hypotheses. The latter shall be further outlined and evaluated via the outcome of the methodology whilst reflecting on the literature. In the appendix one can find all the regressions that were used, including all control variables.

4.1 Control Variables

Of the main control variables we find that across all regressions, high pre-deal operational efficiency of target firm, as measured via EBITDA/Assets, appeared to be significantly detrimental for the ability of the acquirers to create post-deal operational improvements. This was both significant in the quantitative and linear probability binary models for both revenue and cashflow regressions. This appears to be in line with the article published by Cressy, Munari, and Malipiero in 2007, where they find that the initial selection of target firms via profitability is highly significant and arguably more important than managerial skill of the PE firm for the subsequent performance of a deal. This argument is quite intuitive as it is arguably more difficult for well-run firms to further improve on their current performance than it is for those that have a handful known areas of improvement.

Moreover, we find across all regressions a strong indication that the sector in which the target firm operates to be highly significant for the likelihood of operational improvements qua cashflow and revenue efficiencies, where lesser technological and know-how intensive industries fared better than their high-tech and knowledge-intensive counterparts. Similarly, the linear probability models exhibit outcomes that are analogue to the aforementioned trends in the data.

Next, we find substantive evidence in the fund-level linear probability models that deal types influence the likelihood of operational improvements in a deal as institutional buyouts and minority stakes appear to be less successful in obtaining them than deals that are classified as an “Acquisition”. Surprisingly on the contrary, in the deal-level regressions we find a positive effect of institutional buyouts and minority stakes as opposed to acquisitions. The effect of deal-types on operational improvements is further elaborated upon in section 4.3.

Another factor for operational improvements in a PE deal appears to be the strategy the acquiring fund is pursuing. We find evidence that the likelihood of operational improvements qua cashflows decreases as target firms backed by broad so-called “fund of funds” significantly underperform the

standard buyout strategy, which was usually opted for by funds in the dataset. On the other hand, we see that PE firms specialized in growth subsequently enhance organic developments via revenue turnover and cashflow improvements of the acquired firms. Moreover, a strong positive indication was found in the linear probability models in cashflow improvements by funds with a unique strategy such as turnarounds, secondaries, etc. which ultimately was classified as "Other".

Due to the prominence of persistence on performance in private equity, the proxy quartile ranking as published on Preqin was used as a control variable to account for this in both the deal and fund-level regressions (e.g. Kaplan, Schoar, 2005; Demiroglu, James, 2010). Strikingly, we find that persistence as measured via quartile ranking on IRR, did only marginally appear to be a strong indicator for future operational improvements in target firms with medium significance for the 3rd and 2nd quartile backed PE-target firms to be more likely to and on average manifest greater operational improvements than 1st quartile-backed target firms. Furthermore, those backed by 4th quartile funds did appear to underperform the firms backed by 1st quartile funds.

Moreover, the year of the deal and country of target firm appeared to be significant for future improvements, where deals in the years 2016, 2017 and 2019 on average were more likely to and exhibited greater cashflow and revenue improvements, where in the fund-level regressions it appeared that countries in and surrounding the Benelux, Scandinavia, and west-Mediterranean Europe exhibited higher success rates in deals.

4.2 Hypothesis 1 – Cross-Border Transactions

First, H1 was investigated to analyze what the effect is of a cross-border transaction on the underlying operational improvements of the target firm. To do so, the respective deal-level characteristic regressions were conducted and their respective outcomes can be found in table 2 below. For the deal-level characteristics, we interestingly find a strong positive indication that cross-border deals fare better than deals that are conducted in the respective country of the PE firm, where the significance is of greater magnitude when looking at the revenue developments. Therefore, local deals on the contrary, exhibited on average worse underlying operational improvements than their intranational counterparts

This result is counterintuitive at first as informational advantage and lower transaction costs are the prime associated benefits of private equity, where however most of the literature noted the presence of higher informational and transactions costs in intranational transactions (Aizenman, Kendall, 2008; Meuleman, Wright, 2011; Holloway et al., 2016). Nevertheless, as cross-border deals are to overcome

the aforementioned drawbacks, it is possible that the acquirors set higher hurdle-rates for the riskier investments which would give rise to an endogenous issue to the methodology which could explain the apparent paradoxical outcome (Hochberg, Ljungqvist, 2009). Moreover, foreign entry is easier for better performing funds, leading to a possible selection bias despite the quartile ranking as a control variable (Holloway et al., 2016).

When exacerbating the problems associated with cross-border buyouts to intercontinental deals, we find that the supposed business improvements in the latter category of deals fare significantly worse than their closer ranged cross-border counterparts, with strong significance across all regressions and linear probability models. Overall, this strongly resonates with most of the aforementioned cross-border literature which indicates the negative effects of informational asymmetries, transaction and monitoring costs in private equity deals (e.g. Humphrey-Jenner et al., 2017; Aizenman, Kendall, 2008; Meuleman, Wright, 2011).

When using a partner to overcome the associated drawbacks of long-distance deals, we find strong evidence that working with a local partner improves both the likelihood and magnitude of operational cashflow improvements and efficiencies in the target firm following the buyout. This reinforces the signaling value of using a partner in the acquired firm's domicile, where it appears to warrant the performance of a buyout via a higher efficacy of company assets to generate cash flows (Humphrey-Jenner et al., 2017; Meuleman, Wright, 2011).

Table 2 – Deal-level coefficients

Dependent variable	EBITDA % inc.	Revenue % inc.	EBITDA/As. % inc.	Revenue/As. % inc.	EBITDA/As. (M)	Revenue/As. (M)
Cross-border	.3894	.4116	.3911(*)	1.317(***)	.6075	1.526(**)
Intercontinental	-.9965	-.3422	-.3946(**)	-.5821(**)	-.5885(***)	-.7176(***)
CommonTies	.0327	-.0276	.1115	.03869	-.0633	-.0190
Local_Partner	.8824(***)	.2150	.1522(**)	.2882	.3689(*)	.2424
Controlled for:						
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Country	No	No	No	No	No	No
N	100	100	100	100	100	100

*This table exhibits the coefficients of the Deal-level variables of interest. Key control variables are marked as fields with either "Yes" if it was accounted for in the regression and "No" otherwise. The non-marginal outcomes indicate the dependent variable ratio increase, where the marginal effects (M) roughly correspond to linear probability increases of the binary dependent variable obtaining a value of 1. The significance of 10%, 5% and 1%, is displayed as *,**, and *** respectively.*

4.3 Hypothesis 2 – Management Buyouts & Deal Types

Second, H2 was construed to see whether the deal type management buyout exhibits greater post-deal operational improvements when compared to regular buyouts as incumbent management arguably has significant informational advantages and could even significantly influence the way the firm is presented at the time of the buyout. Unfortunately due to multicollinearity and the relatively limited amount of management buyouts of 50 in the dataset sample, with even less deals containing pre- and post- buyout data, I was unable to draw up a specific regression solely dedicated to the MBO sample in the data. Therefore, the regressions of H1 were reconducted but without the variable fund_strategy to reduce variance and avoid multicollinearity, whilst enhancing significance as we are solely interested in deal-types such as management buyouts.

The results can be found in the appendix in regressions 5 & 6, in which there was no significant difference found by MBO's on both cashflow and revenue operational improvements. This affirmative of most of the academic literature, which indicates that despite the intuitive advantage of incumbent management prior to the deal, they are less likely to act from inside information or engage in underpricing of the firm (Smith, A. J., 1990; Kaplan, S., 1989)

Conversely, the aligned principle-agent argument finds mixed results as institutional buyouts and minority stakes did appear to have a significant effect on cashflow improvements of target firms. However, we find no clear indication as there appear to be contrasting outcomes when comparing the deal-level regression with the fund-level linear probability model, where we find greater quantitative improvements in the former, whereas the likelihood of success in a deal is negatively effected in the latter. An explanation for the worse operational improvements in institutional buyouts could lie in the worse aligned incentives with institutional and minority stake investors maximizing investments and strategic benefits respectively. On the other hand, possible benefits of such deals for business improvements could be explained via the higher decisional liberty for management and refocused orientation of the business model on key areas of competitive advantage of the firm. (Bloom et al., 2015; Lerner et al., 2011). Ultimately, the mixed of evidence of MBO outperformance does appear not strengthen the argument for superior aligned-principles in such deals over other buyout types.

4.4 Hypothesis 3 – Co-Investment Funds

Third, we were interested whether funds that offer Co-investments benefit from higher operational improvement in the deals via the enhanced exposure to a broad and diverse network. As such, the results for the Fund-level characteristics on target firm operational results can be found in table 3 in below. When looking at funds that engage in co-investments, we do not find any significant evidence

for possible operational improvements across all regressions. Similarly, adding an interaction effect between co-investments and the natural logarithm of fund size yielded no significant effect either, whilst it did decrease the overall significance of other coefficients substantially and was therefore thereafter excluded.

The results appear to be in somewhat line with the perceived syndication benefits of Limited and General Partner as well as pooling risk indicators, where however individual co-investment themselves do not appear to outperform direct fund investments (Fang et al., 2015). Moreover, the argument for adverse selection in Co-investments was similarly rejected as the target firms of such funds did not have not exhibit worse operating improvements after the buyout had been conducted (Braun et al., 2020). Furthermore, the argument for better access to capital appears to find an positive indication across most regressions, where strongly significant for the quantitative regressions as funds that are later in the respective series exhibit greater cashflow and revenue improvements in the acquired firm. This therefore stresses the one of the key functions of offering Co-investments as it allows for a better relationship between the GP and LP, and ultimately enhance performance via the diffusion of knowledge and deal flow (Braun et al., 2020; Hochberg et al., 2007). Moreover it further stresses the positive relationship of a fund's sequence and investment returns (Kaplan, Schoar, 2005).

However, it is important to note that more capital in the fund itself does not seem to enhance operational developments qua revenue and in fact reduces such operational performance. For more elaboration on fund size and reputation, In section 4.6 I we shall scrutinize the effect of fund size deal performance in more detail.

Table 3 – Fund-level coefficients

Dependent variable	EBITDA % inc.	Revenue % inc.	EBITDA/As. % inc.	Revenue/ As. % inc.	EBITDA/As . (M)	Revenue/As . (M)
Co-Investment	.3044	-.0274	.0904	-.0963	.0107	.0688
Fund_no_Series	-.0406	.0255	.0174(***)	.0674(***)	.0100	.0228
Fund_no_Overall	-.0137	-.0018	-.0019	.0014	-.0065 (**)	-.0042
LNFundSize	-.0367	-.0479	-.0283(**)	-.1500 (*)	-.0707	-.0829 (*)
Regional_Diversified	-.0118	.1674(*)	.0264	-.0787	.1641 (*)	-.0429
Industry_Diversified	.6363(**)	.1932	.0964	-.0640	-.0874	-.0262
Controlled for:						
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes
N	156	156	156	156	156	156

This table exhibits the coefficients of the Fund-level variables of interest. Key Control variables are marked as fields with either "Yes" if it was accounted for in the regression and "No" otherwise. The non-marginal outcomes indicate the dependent variable ratio increase, where the marginal effects

*(M) roughly correspond to probability increases of the binary dependent variable obtaining a value of 1. The significance of 10%, 5% and 1%, is displayed as *,**, and *** respectively.*

4.5 Hypothesis 4 – Regional & Industry Diversification

Fourth, as regional and industry diversification appears to have enhanced fund returns in past literature, we are interested whether a broader scope in the fund specialization enhances the subsequent operational improvements in buyouts. Therefore, the variables Regional_Diversified and Industry_Diversified were construed to capture this possible effect. These variables are binary values which take the value of 0 when the acquiring fund specified their region to a specific country, or similarly to specific industries, and 1 otherwise. Our findings can be found in table 3 above.

When looking at the effects of regional diversification on the underlying operational improvements, we find slight evidence for a positive impact on the likelihood of cashflow improvements and a positive impact on revenue of acquired firms that are backed by a regionally diversified PE fund, that is, a fund specialized in a continental area as opposed to a specific country. This indicates that operational efficiency could still be sacrificed by spreading resources too thin, where however the broader network could warrant a stronger revenue baseline as network transactions are preferred over at-arm length market interactions (Metrick, Yasuda, 2010; Hochberg et al., 2007). When looking at industry diversification, we find a significant effect of Industry diversification on the underlying operational improvements for cashflow improvements of target firms that are backed by industry diversified PE funds. On the contrary then, we do not find any benefits from industry specificity of PE funds via choosing a certain sector as exhibited through in cashflow or revenue improvements.

This is appears to confirm to what most of the literature finds, namely that diversification enhances PE performance qua returns via facilitating the diffusion of knowledge between differing scopes, enhanced managerial risk sharing and enabling one to benefit from several business cycles at a time (Humphrej-Jenner, M., 2013; Lossen, U. 2007; Bowden et al., 2016). An explanation for the weaker than expected evidence for the argument could be that despite the broad implications of revenue and EBITDA variables, the successful implementation could take longer than a year or two after the deal has been conducted in the target firm. This entails that most of these long term effects would be largely uncaptured by the post-buyout data, which is in line with the 1,5 year average of the sample. See table 4 in the appendix for the statistics on duration between pre- and post-deal data of the sample.

Furthermore, for possible specialization benefits, it is noteworthy to mention that strategy of the fund appears to be relevant for the likelihood of enhancing underlying operational improvements in the fund-level regression as was described section 4.1. To summarize, broader fund of funds exhibit less

improvements, where specialized funds classified as “other” are more likely to outperform in deal improvements. This could be interpreted that a specialized investing style is more relevant for obtaining for obtaining operational improvements in acquired firms, as opposed to the selection of region or industry.

Additionally, we see a strong negative indication for deals that are conducted between continents. Diversification across continents therefore appears to be more difficult to replicate successfully unless sufficient human capital and especially experience via local expertise is present to initiate such a widening of investment scope.

Next, when looking at the control variables we find that that relatively traditional industries such as wood, transportation, and construction fare better after a buyout, where technological intensive or specific know-how industries such as post, media and communication see significant declines the likelihood and magnitude of operational improvement. This is largely in line with the notion that PE-backed firms have better governance, management and monitoring practices in general (Bloom et al., 2015). Employees of the funds themselves however, on average do exhibit less organic industry knowledge that could aid the target firm in subsequent market expansion unless they have a strong affinitive background in respective industry via corporates or consulting firms (Acharya et al., 2013). This could entail that diversifying into know-how intensive industries might only be beneficial insofar the sector or region would be closely match the track record, experience, or overall managerial capability of the fund, whereas managerial intensive industries could be relatively less difficult to expand into.

4.6 Hypothesis 5 – Size, Reputation and Persistence

Fifth, we were interested whether size, reputation, and historic performance of a fund could be used as an indication for the subsequent business improvements they achieve in their buyout deals. In table 3 in section 4.4, we find the results where most notably the size of the fund, as measured via the natural logarithm of the size of the fund in millions of Euros, on average negatively affects the operational improvements following a buyout. This is in accordance with the broader notion that higher capital inflows create higher valuations and decrease the subsequent returns coming from them as there are only a limited amount of investment opportunities available (Kaplan, Stromberg, 2009). As larger funds are inclined to engage in larger deals with not only cheaper debt but also more leverage, which ultimately reduced the need for organic improvements to obtain a positive investment return (Axelson et al., 2007; Demiroglu,et al. 2010). Moreover, this further stresses the difficulty of

obtaining economies of scale in PE due to the human capital intensive nature of the industry (Lopez-de-Silanes et al., 2015).

Moreover, when looking at the reputation of a fund qua the respective historical IRR quartile, we find some evidence for persistence of PE-fund performance on the operational improvements of the deal. This being as we surprisingly see that the 3rd and, to a lesser degree, 2nd quartile funds significantly exhibit deals with greater operational improvements in acquired firms. It appears then that first quartile funds do not yield better operational results than those in the middle cohort. This could be explained as top quartile funds have better access to capital, thereby enabling them to engage in larger deals and subsequently use more leverage in their deals to enhance investment returns via leveraging, market effects or significant multiple expansion as opposed to internal operational improvements (Kaplan, Schoar, 2005). Moreover, we do see that firms backed by funds in the lowest quartile exhibit lower cashflow improvements in the deal-level regression than target firms of funds in the higher quartiles.

Analyzing the overall and series number of the fund, we see a strong insignificant indication across most regressions that newer PE funds from a certain fund series display greater operational improvements than those from earlier funds in the series. On the contrary, this effect is the significantly opposite for the likelihood of cashflow improvements when looking at the overall fund number from all funds that have been created by the private equity group. These findings further emphasize that it is not only vital to have broad network but that the type of network is more important than the quantity of individuals in it. (Hochberg et al. 2007). Moreover, it highlights the greater eagerness of younger funds for establishing a great beginning track record as well as the conservativeness of those with a renowned and more experienced past (Ljunqvist, et al., 2017).

Moreover, as can be seen in the section 4.1 control variables section, we find that deals of a larger size appear to be more likely to exhibit greater revenue improvements in the fund-level regressions as well as enhance cashflow improvements in the deal-level regressions. With funds of a greater reputation being able to attract on average better deals and more capital, funds of larger size and reputation tend to be more prominently present in larger deals. (Kaplan, Schoar, 2005; Humphery-Jenner, 2012). This presents a window of opportunity for funds of larger size to engage in such deals, creating the opportunity for greater operational returns than smaller funds.

Chapter 5 – Conclusion

To conclude and summarize this paper, we shall reiterate the central research question and the present the hypotheses that were brought forward. Thereafter, each hypothesis shall each either be accepted or refuted based on the given literature findings and research outcome from the previous segments to accordingly construct an answer to the central research question.

5.1 Central Research Question & Hypotheses

This paper initially set out to investigate what the effects of recent PE developments, such as cross-border deals; increasing diversification; using a local partner; offering co-investments, are on overall buyout performance. More specifically, the performance was measured via operational improvements in the target firm of the deal, where the analysis consisted of characteristics on a fund- and deal-level through a post euro crisis European buyout sample. In order to investigate this, the following hypotheses were construed:

- *H1a: cross-border transactions are more likely to exhibit worse operating performance of the target firm and on average underperform domestic deals when measured via differences between pre- and post-deal metrics*
- *H1b: The usage of local partners reduces the likelihood of a negative operating performance of the target firm and enhances the and post- deal financial metrics*
- *H2: Firms that are subject to Management Buyouts have stronger cashflow increases than non-MBO deals as measured via differences between pre- and post-deal cashflow metrics*
- *H3: Deals by funds that offer Co-investments are more likely to exhibit operational improvements than other firms that are not backed by such funds*
- *H4a: target firms that are backed by Industry diversified funds exhibit greater operational improvements than those that are backed by industry specific deals.*
- *H4b: target firms that are backed by geographic diversified funds exhibit greater operational improvements than those that are backed by industry specific deals.*
- *H5a: target firms that are backed by larger funds exhibit greater operational improvements than those backed by smaller funds.*
- *H5b: target firms that are backed by funds that are in higher quartile rankings of performance, exhibit greater operational improvements than those backed by lower quartile ranking funds*

5.2 Hypotheses Evaluation

In this section we shall evaluate each hypothesis and either accept or refute them.

5.2.1 Hypothesis 1

With Private equity being a knowledge intensive field, most of the literature indicates that cross-border deals are subjective to several serious disadvantages such as higher informational asymmetries or transaction costs. On the contrary, our findings suggest that cross-border deals on average exhibit greater operational improvements than domestic deals. We note here that endogeneity and self-selection could be at stake here as riskier deals might be subjective to higher standard before engaging in them, where better firms find it easier to expand internationally. When magnifying the supposed drawbacks by analyzing cross-continental deals however, we see that such a deal characteristic does strongly negatively affect the likelihood and magnitude of operational improvements in target firms. This ultimately reinforces the prominence of informational asymmetries and distance-related transaction related costs in the success of a deal. To overcome such drawbacks then, the literature argued that utilizing a local partner could signal value and enhance the subsequent performance of such deals. Our findings confirm the latter where cashflow improvements were both more likely and of larger magnitude when a local partner was involved in the deal. We therefore do not find evidence for H1a, whereas we do find substantial positive evidence for H1b. This leads to the rejection of the former, where the latter sub-hypothesis is accepted.

5.2.2 Hypothesis 2

With private equity transactions being ascribed to align incentives and reduce agency costs, we find that management buyouts theoretically exhibit a perfectly aligned principle-agent relationship. Moreover, incumbent management is able to modify earnings to some extent and arguably have informational advantage at the time of the deal, which lead us to believe that such a deal-type could exhibit greater post-deal operational improvements than other deal types. The outcome of our methodology however, does not yield any evidence for better operational results via management buyouts than other sub-deal types. However, the aligned principle-agent benefits argument does find mixed evidence as institutional buyouts and minority stakes appear to underperform the acquisitional buyouts qua likelihood of success, where on the contrary they outperform in the quantitative regressions. Ultimately then, we reject H2 due to the lack of positive and consistent evidence, thereby affirming the literature finding that management buyouts are not initiated due to superior information.

5.2.3 Hypothesis 3

The recent trend of offering co-investments outside the fund fee structure might appear as a dazzling development at first, yet it could offer beneficial effects such as obtaining a broader network and improve relationships for future capital raising endeavors. With network effects having a strong positive prominence in the industry by ensuring better deal flow, a broader knowledge scope, and larger capital pool, we expected funds that engage in co-Investments to find better deals and subsequently on average experience higher operational improvements. Where we do find a positive indication for operational improvements across all regressions, they are not significant, thereby leading us to not find enough evidence to accept H3 where however further narrowed down research could yield positive results.

5.2.4 Hypothesis 4

In recent years we have seen a proliferation of expanding funds that diversify their investments both regionally and qua industry. Most of the literature findings suggest that such diversification could lead to higher investment returns via knowledge-spillover, managerial risk-sharing and benefitting from several simultaneous business cycles, but where resources must not be spread too thinly in the pursuit of it. We subsequently hypothesized that deals of diversified fund exhibit greater operational improvements. Our findings suggest that industry diversification can enhance cashflow improvements in the deals, where regional diversification by the fund obtained similar positive results in enhancing the likelihood or magnitude of beneficial operational development in the acquired firms. This leads us to conclude that we find sufficient evidence to both accept H4a and H4b

5.2.5 Hypothesis 5

With private equity being a relatively opaque and confidential industry in which most of the deal flow is not available to the public, the track record, reputation and network of a fund is of utmost importance for the competitiveness of the PE firm. The literature indicated that persistence qua past investment returns is a significant predictor for future performance. This strongly resonates with better performing funds being able to raise more capital, having a broader network and more human capital at their disposal. Therefore, we expected larger and historically better performing funds to engage in more operationally successful deals than those of smaller size and with a poor track record. Conversely, our findings suggest that fund size decreases the likelihood and magnitude of operational improvements in the acquired firms. Moreover, persistence appears to be less self-explanatory for operational improvements in deals than fund returns as we see that well- to mediocre performing funds obtain better results than the top performing quartile, where the lowest quartile underperforms

all. This ultimately leads us to reject both 5a and 5b as we do not find enough consistent evidence for persistence as presented in the literature to accept 5b.

5.3 Answering the Central Research Question

Referring back to the introduction of the paper, we see that the main research question was brought up after having laid out the current investment landscape. This pressed the following question forward: namely what the relevant factors are to consider in private equity deals and how do the recent new developments have impacted the operating performance of the acquired firms. When reflecting on section 4 and the previously evaluated the hypotheses, there are clear underlying factors on both deal- and fund-level that help in answering the main research question.

First, We find several relevant deal-characteristics that are relevant for subsequent operational performance in deals. Main beneficial traits appear to be cross-border transactions, where however cross-continental deals fare significantly worse. Overall, using a local partner on average enhances the likelihood and magnitude of subsequent business improvements in acquired firms. Moreover, the sector of the target firm appears to be relevant, where more traditional industries like textile, wood, and construction appear to align better with the managerial skill of private equity firms as opposed to industries with specific know-how like telecommunications. Next, we find that deal types such as institutional buyouts or acquired minority stakes can have a significant effect on the likelihood of operational performance, where aligned incentives and agency-principle theory appear to partly drive this result.

Second, when looking at fund-level characteristics, we see that despite the trends in and proclaimed benefits of industry-wide diversification, we only find evidence in one analysis that it subsequently enhanced the practical performance of acquired firms. Spreading resources regionally finds positive results in obtaining a higher operational performance. Interestingly and in line with benefits associated with specialization, we see that the strategy of the fund could influence the deal performance as growth or “specialized” funds exhibit greater improvements, where firms with a wider scope such as “fund of funds” reduce the likelihood of such developments. Additionally, funds that with an extensive past other set up funds are less likely to obtain cashflow improvements. Next, persistence appeared to also influence operational improvements in buyouts, where however the upper investment return funds underperformed the middle and upper cohort but still outperform the bottom quartile. Moreover, although there was a positive indication that co-investments benefit operational performance, it was not significant. Lastly, the size of the fund appeared to have a negative relation to the likelihood and magnitude of with subsequent future improvements.

5.4 Implications Industry

Reflecting on the recent industry trends, there are several implications for the industry that can be derived from this paper. First, we see cross-border deals on average appear have successfully deflected the disadvantages that come with them. Noteworthy however, the intercontinental deals fare significantly worse in obtaining operational improvements, where however using a local partner can significantly improve the chances of overall success. Second, the managerial skill of PE firms appear to be better aligned in more conventional and less tech-savvy industries where managerial practices are more essential for obtaining a competitive advantage. Third, the apparent regional diversification benefits at the fund-level, qua higher returns, do not appear to directly translate into higher operational improvements in acquired firms. Diversifying across industries and regions however, does appear to improve the chances of operational cashflow improvements in the deals. Fourth, the size of the fund appears to be strongly negatively related to subsequent operational improvements. Lastly, funds of a specific sequence appear to be more proficient in obtaining revenue and cashflow improvements the more funds they have set up around that investment scope.

5.5 Recommendations to future researchers

Despite the aim of this paper, the relatively broad scope and syndication of databases brought several drawbacks with it. The most prominent one is that it does not allow to include all previously considered relevant variables from the perspective of the literature. One such main variable is the leverage that is used at the time of the buyout as due to the lacking disclosure practices in private equity, the actual leverage at the time of the deal was not displayed in the Zephyr database. Adding this variable in future research could add new dimensions of insight.

Another area of improvement could be using stronger proxies for market indicators. Due to the lack of specification of the specific year of the pre- and post-deal financial data as was outlined in section 1.4, only the specified industries and countries of the target firm as well as year of the deal were used to capture market effects. Future research could benefit stronger industry-effects specification via linking certain industries to a selected peer group of companies across several years where the respective increases or likelihood of positive trends in the ratios are used as a control variable for industry effects.

Moreover, when calculating the marginal effects, a linear probability model was used due to its intuitiveness and straightforward application. Such a methodology however, is not sufficient for actual predictions as the predicted binary variables are able to take values exceeding the parameters of 0 or 1. Therefore, the adaptation of a logit or probit model could be made to improve the predictability with respect to the coefficient outcomes as exceeding the logical boundaries would no longer be

possible. Ultimately, this modification of not opted for as it yielded too small of a sample from the syndicated database to conduct significant analysis where multicollinearity was present by the logistic-like regression over the binary dependent variables.

Lastly, additional control variables could be added in each hypothesis to enhance the validity of the outcome of the research. To name a few, for H1, one could add variables for distance-related costs between target and the acquiring firm. For H2, one could add the equity stake of incumbent management of the deal for the better aligned principle-agent argument. For H4, variables that would capture the overlap of the initial specialization with the new investment scope, such as similar deals in track-record, would enhance the experience argument in diversification performance. Lastly for H5, more reputational variables such as the amount of times mentioned in a given private equity newspaper or global industry- or regional-deal rankings would similarly enhance the investigation of the hypothesis.

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Appendix

Images

Image 1: Filter Zephyr

Product name	**Zephyr**	
Update number	**30**	
Software version	**30.0**	
Data update	**06/07/2021 (n° 30252225)**	
Username	**Erasmus Universiteit-11593**	
Export date	**07/07/2021**	
Cut off date	**31/03**	
1.	**Current deal status: Completed**	**1,918,397**
2.	**World regions: Western Europe (Acquiror OR Target OR Vendor)**	**744,082**
3.	**Deal type: Institutional buy-out**	**38,791**
4.	**Sub-deal type: Contested bid, Distressed sales/companies, Exit, Partial exit, Follow on offer, Leveraged Buy out, Multiple bids, Public takeover by Private equity, Secondary Buy out, Secondary offer, Tender offer, Buy & Build, Tertiary Buy out**	**133,537**
5.	**Deal financing: Private Equity**	**126,467**
6.	**Time period: on and after 01/01/2013 and up to and including 01/01/2020 (completed-confirmed)**	**710,877**
7.	**Pre deal multiples: Deals match at least one criteria; including estimates; Pre-deal value multiple on operating revenue/turnover: All deals with a known multiple; Pre-deal enterprise value multiple on operating revenue/turnover: All deals with a known multiple**	**513,321**
8.	**Pre deal multiples: Deals match at least one criteria; including estimates; Pre-deal value multiple on EBITDA: All deals with a known multiple; Pre-deal enterprise value multiple on EBITDA: All deals with a known multiple**	**239,652**
9.	**Post deal multiples: Deals match at least one criteria; including estimates; Post-deal value multiple on operating revenue/turnover: All deals with a known multiple; Post-deal enterprise value multiple on operating revenue/turnover: All deals with a known multiple**	**544,760**
10.	**Post deal multiples: Deals match at least one criteria; including estimates; Post-deal value multiple on EBITDA: All deals with a known multiple; Post-deal enterprise value multiple on EBITDA: All deals with a known multiple**	**251,635**
	Boolean search : 1 And 2 And (3 Or 4 Or 5) And 6 And 7 And 8 And 9 And 10	
	TOTAL	**1,578**

Note: This is the filter that was applied to the Zephyr database in order to obtain a sample of European buyouts between 2013 and 2019, concluding a total of 1578 buyouts that match the criteria. This was the sample whereby the Preqin variables were later synthesized in the individual deals.

Image 2: Filter, Variables of interest & Column selection in Preqin

FUND ID	FIRM ID	NAME	VINTAGE / INCEPTION YEAR	FINAL CLOSE SIZE (USD MN)	GEOGRAPHIC FOCUS	FUND MANAGER	COUNTRY
NET IRR (%)	PREQIN QUARTILE RANK	STRATEGY	DOMICILE	FUND SIZE (USD MN)	FUND NUMBER (OVERALL)	FUND NUMBER (SERIES)	INDUSTRIES

Note: these were the selected columns to be displayed in the Preqin fund selection. Ultimately, the outcomes of these variables were used as input for the independent (or control) variables. Key variables used to match the fund with the respective deal: Name, Vintage/ Inception Year, Geographic Focus, Fund Manager, Country, Strategy, Fund Size, fund number overall, fund number series

Tables

Table 4: Sample validity – Periodic difference pre- & post- data

Average			
T = deal completion date	Pre-deal (T - X years)	Post-deal (T + X years)	Total difference
Mean	1,13	0,48	1,61
Median	0,83	0,40	1,23
Std Dev	0,87	0,80	0,87

Note: the displayed numbers are in years, where it appears that there is a larger periodic difference between the provided numbers of Orbis and Zephyr prior to the deal rather than after. I refer to the table below for a worked out example that highlights the methodology that was used.

Table 4a: Example – Periodic difference pre- & post-

Deal completion			
Pre-deal revenue		Post-deal revenue	
Zephyr	100	Zephyr	150
Orbis 2013	90	Orbis 2018	145
Orbis 2014	110	Orbis 2019	160
Inferred Year	2013,5	Inferred Year	2018,33
T-X	1,5	T+X	3,33

Note: this is a hypothetical example of a buyout to display the methodology of deriving the periodic difference between pre- and post- deal data.

Table 5: Correlation Table – deal-level (average across regressions)

	Year	Target~y	T~Sector	Deal_T~e	P~EBIT~s	Deal_S~e	Quarti~k	Cross_~r	Interc~l	Common~
Year	1									
Target_Cou~y	0.0511	1								
Target_Sec~r	-0.0970	0.0395	1							
Deal_Type	0.1020	0.1056	0.1361	1						
PredealEBI~s	0.0465	0.0313	-0.1301	0.0064	1					
Deal_Size	0.0613	-0.1876	-0.0860	-0.1787	-0.1232	1				
Quartile_R~k	0.0340	-0.1108	-0.0135	-0.1312	-0.0682	0.1956	1			
Cross_border	-0.0082	-0.1025	0.0722	-0.1888	0.0324	-0.0697	0.1229	1		
Interconti~l	0.1655	-0.0496	0.0629	-0.0870	-0.0816	0.1415	0.0384	0.0205	1	
CommonTies	-0.0335	-0.0781	0.1177	0.1627	0.0204	-0.1286	0.1159	-0.1499	0.0839	1
Local_part~d	0.0671	-0.0307	-0.0757	0.0442	0.0722	-0.1682	-0.0139	-0.3408	0.1279	0.0414

Note: This is a correlation table that exhibits the average correlation of all respective variables in the deal-level regressions

Table 5a: Correlation Table – Fund-characteristics (average across all regressions)

	Target~y	Year	T~Sector	Deal_T~e	Fund_S~y	P~EBIT~s	Deal_S~e	Quarti~k	Interc~l	Coinve~t
Target_Cou~y	10.000									
Year	0.0835	10.000								
Target_Sec~r	0.0296	-0.0966	10.000							
Deal_Type	0.1384	0.0553	0.0155	10.000						
Fund_Strat~y	0.0708	0.0985	0.0289	0.1531	10.000					
PredealEBI~s	0.0495	-0.0347	-0.0834	-0.0033	-0.0536	10.000				
Deal_Size	-0.1482	-0.0425	-0.1162	-0.1115	-0.2347	-0.0528	10.000			
Quartile_R~k	-0.1027	0.0165	0.0590	-0.0330	-0.2023	-0.0055	0.1795	10.000		
Interconti~l	-0.0473	0.1171	0.0611	-0.0457	-0.0735	-0.0737	0.1609	0.0382	10.000	
Coinvestment	-0.0052	0.2880	-0.0212	-0.0241	-0.0220	-0.1595	-0.0591	0.0490	-0.0160	10000
Fund_numbe~s	0.1361	0.0349	-0.0529	-0.0428	-0.0409	-0.0322	0.1778	-0.0165	0.0229	0.0663
Fund_numbe~l	0.0279	0.0009	-0.0191	-0.0284	-0.0104	-0.0158	0.2462	0.0373	0.0762	-0.0812
LNFundsize	0.0007	0.0394	0.0030	-0.0841	-0.3461	-0.0205	0.6167	0.1347	0.1222	-0.1136
Regional_D~d	0.0521	0.0577	-0.1123	-0.0615	0.0600	0.0149	0.3575	-0.1331	0.0692	-0.0749
Industry_D~d	-0.1119	-0.1182	-0.0986	-0.1208	-0.4124	0.0250	0.3157	0.1339	0.0548	0.0333

(Continued)

Fund_n~s	Fund_n~l	LNFund~e	Region~d	Indust~d
Fund_numbe~s	10.000			
Fund_numbe~l	0.1609	10.000		
LNFundsize	0.4497	0.3080	10.000	
Regional_D~d	0.2047	0.2708	0.4557	10.000
Industry_D~d	-0.0852	0.1173	0.2715	-0.0856

Note: This is a correlation table that exhibits the average correlation of all respective variables in the fund-level regressions

Table 6: Table of all variables:

Variable	Explanation	Category
Year	number of years after 2012	Interval, ranked
DifferenceEBITDAAssets	Difference in pre- & post- EBITDA/Assets	Continuous
DifferenceRevenueAssets	Difference in pre- & post- Revenue/Assets	Continuous
EBITDAincrease_Index_Log	Log of the Pre-deal EBITDA index with the % change between pre- & post	Continuous
Revenueincrease_Index_Log	Log of the Pre-deal Revenue index with the % change between pre- & post	Continuous
EBITDAAssetsincrease	Takes 1 if EBITDA/Assets increased	Binary
RevenueAssetsincrease	Takes 0 if EBITDA/Assets did not increase	Binary
SizeVariable	Categorical variable of deal size, from small to big (A-F)	Categorical
Target_Sector	Sector of target firm, as classified by Zephyr	Categorical
Target_Country	Country of target firm, as classified by Zephyr	Categorical
Cross-Border	International transaction, 1 if true, else 0	Binary
Intercontinental	Inter-continental transaction, 1 if true, else 0	Binary
Local_Partner	Local partner present in acquiring group firms	Binary
CommonTies	Whether the two countries have a common language	Binary
LNFundsize	The natural logarithm of the size of the fund	Continuous
Fund_Geographic	Specialized geographical area of the fund	Categorical
Fund_Industry_Total	Specialized industry or area of the fund	Categorical
Regional_Diversified	If fund Geographic is nation specific, 1, else 0	Binary
Industry_Diversified	If fund industry is industry specific, 1, else 0	Binary
Quartile	Preqin Quartile ranking, based on past IRR of funds	Categorical, ranked
Dealtype	The specific deal type of the buyout transaction in question. E.g. Secondary, turnaround	Categorical
Fund_number_series	The number of the fund with respect to the specific series or sequence of the fund	Interval
Fund_number_total	The number of the fund with respect to all past funds	Interval
Coinvestment	Whether Co-investments were offered by the fund or was present in the strategy or title	Binary

Note: This table summarizes and classifies all variables respective variables into which category of variable it belongs.

Regression 1-6 – Deal-level analyses

Regression 1: EBITDA Index Log – deal-level

Linear regression

Number of obs	=	100	
F(10, 14)	=	.	
Prob > F	=	.	
R-squared	=	0.4823	
Root MSE	=	1.0301	

(Std. Err. adjusted for 15 clusters in Target_Sector)

EBITDAincrease_Index_Log	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.5732597	.3982267	-1.44	0.172	-1.427371	.2808516
3	.3966862	.317459	1.25	0.232	-.2841956	1.077568
4	-.3469857	.4597302	-0.75	0.463	-1.333009	.6390375
5	.5814169	.5195705	1.12	0.282	-.532951	1.695785
6	.4192832	.4387265	0.96	0.355	-.5216917	1.360258
7	.4792214	.4062251	1.18	0.258	-.3920448	1.350488
Target_Sector						
Construction	-4.393117	.2182689	-20.13	0.000	-4.861257	-3.924976
Education, Health	-.326992	.3915913	-0.84	0.418	-1.166872	.5128877
Food, beverages, tobacco	.0045593	.1421615	0.03	0.975	-.3003467	.3094653
Gas, Water, Electricity	-.5735458	1.277601	-0.45	0.660	-3.313726	2.166635
Hotels & restaurants	.4555045	.1414656	3.22	0.006	.152091	.7589179
Machinery, equipment, furniture, recycl..	-.0228426	.2890803	-0.08	0.938	-.642858	.5971729
Metals & metal products	.8347279	.1909442	4.37	0.001	.4251934	1.244262
Other services	.0767664	.1958622	0.39	0.701	-.3433163	.4968491
Post and telecommunications	.1814605	.2315122	0.78	0.446	-.3150838	.6780049
Publishing, printing	1.000067	.3246005	3.08	0.008	.3038685	1.696266
Textiles, wearing apparel, leather	3.072323	.2463126	12.47	0.000	2.544035	3.600611
Transport	.5682554	.2481911	2.29	0.038	.0359385	1.100572
Wholesale & retail trade	-.6576122	.2392545	-2.75	0.016	-1.170762	-.1444623
Wood, cork, paper	-.0779596	.5368006	-0.15	0.887	-1.229282	1.073363
PredealEBITDAAssets	-.8099304	.6188469	-1.31	0.212	-2.137225	.5173641
Deal_Size						
B	.3045424	1.053592	0.29	0.777	-1.955187	2.564272
C	-.0575619	.3465001	-0.17	0.870	-.8007308	.685607
D	.3689927	.3380703	1.09	0.293	-.356096	1.094081
E	.7516271	.5606153	1.34	0.201	-.4507731	1.954027
F	-.1351271	.4229127	-0.32	0.754	-1.042185	.7719304
Quartile_Rank						
2nd	-.3867367	.2740359	-1.41	0.180	-.9744853	.2010119
3rd	-.2325983	.2232801	-1.04	0.315	-.7114865	.2462899
4th	-.77684	.4859964	-1.60	0.132	-1.819199	.2655186
Cross_border	.3894088	.7592355	0.51	0.616	-1.238989	2.017807
Intercontintal_Deal	-.9964935	.1804726	-5.52	0.000	-1.383569	-.6094182
CommonTies	.0326662	.2110961	0.15	0.879	-.4200899	.4854223
Local_partner_used	.8823934	.2856218	3.09	0.008	.2697956	1.494991
_cons	-.5628764	.5820737	-0.97	0.350	-1.8113	.6855475

Regression 1a: EBITDA Index Log – deal-level (MBO, no quartile)

Linear regression

Number of obs	=	594	
F(15, 16)	=	.	
Prob > F	=	.	
R-squared	=	0.0942	
Root MSE	=	.90443	

(Std. Err. adjusted for 17 clusters in Target_Sector)

EBITDAincrease_Index_Log	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	.1053695	.1063704	0.99	0.337	-.1201257	.3308646
3	.2120677	.1537378	1.38	0.187	-.113842	.5379773
4	.1376051	.1129309	1.22	0.241	-.1017977	.3770078
5	.1928732	.1438944	1.34	0.199	-.1121693	.4979156
6	.1020711	.0889075	1.15	0.268	-.0864045	.2905466
7	.0442462	.1465739	0.30	0.767	-.2664766	.354969
Target_Sector						
Construction	-.5356951	.0573372	-9.34	0.000	-.6572445	-.4141456
Education, Health	.4603537	.0243127	18.93	0.000	.4088131	.5118944
Food, beverages, tobacco	-.3052011	.0264598	-11.53	0.000	-.3612935	-.2491088
Gas, Water, Electricity	-.1171136	.0412604	-2.84	0.012	-.2045818	-.0296454
Hotels & restaurants	-.2267151	.050919	-4.45	0.000	-.3346585	-.1187717
Insurance companies	-1.334566	.123917	-10.77	0.000	-1.597258	-1.071874
Machinery, equipment, furniture, recycl..	.0185157	.0258039	0.72	0.483	-.0361862	.0732176
Metals & metal products	-.2057298	.0239857	-8.58	0.000	-.2565771	-.1548825
Other services	.0983262	.0308985	3.18	0.006	.0328244	.1638281
Post and telecommunications	-.1908459	.023871	-7.99	0.000	-.2414502	-.1402417
Primary Sector (agriculture, mining, e..)	-.150076	.0965783	-1.55	0.140	-.3548128	.0546607
Publishing, printing	-.3843644	.1272645	-3.02	0.008	-.654153	-.1145757
Textiles, wearing apparel, leather	.5754803	.0411266	13.99	0.000	.4882958	.6626649
Transport	-.0058213	.0608493	-0.10	0.925	-.1348162	.1231735
Wholesale & retail trade	-.1944864	.0239351	-8.13	0.000	-.2452265	-.1437462
Wood, cork, paper	.0157486	.0622007	0.25	0.803	-.1161109	.1476082
Deal_Type						
Acquisition	-.0878247	.0896207	-0.98	0.342	-.2778122	.1021627
Capital_raise	-.1984857	.3343988	-0.59	0.561	-.9073795	.510408
Institutional_buyout	-.012733	.0941637	-0.14	0.894	-.2123511	.186885
MBO	.3317149	.3849096	0.86	0.402	-.484257	1.147687
PredealEBITDAAssets	-.8019322	.3502566	-2.29	0.036	-1.544443	-.0594214
Deal_Size						
B	-.0799469	.1201643	-0.67	0.515	-.3346838	.1747899
C	-.0212644	.1434944	-0.15	0.884	-.325459	.2829301
D	-.0642697	.0777121	-0.83	0.420	-.229012	.1004726
E	-.0616637	.0803156	-0.77	0.454	-.2319251	.1085976
F	-.1708158	.1244894	-1.37	0.189	-.4347215	.0930899
Cross_border	.0089166	.1642224	0.05	0.957	-.3392193	.3570525
Intercontintal_Deal	-.5118264	.4582905	-1.12	0.281	-1.483359	.459706
CommonTies	-.0730177	.0662144	-1.10	0.286	-.213386	.0673506
Local_partner_used	.18758	.1129466	1.66	0.116	-.0518562	.4270161
_cons	.1090891	.1111502	0.98	0.341	-.1265388	.3447169

Regression 2: Revenue Index Log – deal-level

Linear regression

Number of obs	=	100	
F(10, 14)	=	.	
Prob > F	=	.	
R-squared	=	0.2857	
Root MSE	=	.57925	

(Std. Err. adjusted for 15 clusters in Target_Sector)

Revenueincrease_Index_Log	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.184867	.2853471	-0.65	0.528	-.7968757	.4271416
3	.0918709	.1999573	0.46	0.653	-.3369949	.5207366
4	.1612277	.1860519	0.87	0.401	-.2378139	.5602692
5	.28782	.3302814	0.87	0.398	-.4205632	.9962031
6	.1901713	.0680476	2.79	0.014	.0442237	.3361189
7	.139723	.1976893	0.71	0.491	-.2842784	.5637244
Target_Sector						
Construction	.4270268	.1800907	2.37	0.033	.0407707	.8132828
Education, Health	.1597686	.3323112	0.48	0.638	-.552968	.8725053
Food, beverages, tobacco	.1637875	.0650449	2.52	0.025	.02428	.303295
Gas, Water, Electricity	-.1191793	.7156321	-0.17	0.870	-1.654057	1.415699
Hotels & restaurants	.1574168	.2103291	0.75	0.467	-.2936942	.6085277
Machinery, equipment, furniture, recycl..	.0724775	.1460312	0.50	0.627	-.2407284	.3856833
Metals & metal products	.2937451	.1265075	2.32	0.036	.0224134	.5650768
Other services	.1889685	.1152161	1.64	0.123	-.0581455	.4360826
Post and telecommunications	-.2264291	.1474893	-1.54	0.147	-.5427621	.0899039
Publishing, printing	.3723238	.1932064	1.93	0.075	-.0420628	.7867104
Textiles, wearing apparel, leather	1.329215	.2517128	5.28	0.000	.7893449	1.869086
Transport	.2272742	.1078973	2.11	0.054	-.0041424	.4586908
Wholesale & retail trade	.065625	.2201365	0.30	0.770	-.4065208	.5377707
Wood, cork, paper	.1744663	.1085555	1.61	0.130	-.0583621	.4072947
PredealEBITDAAssets	-.1809564	.2720882	-0.67	0.517	-.7645275	.4026147
Deal_Size						
B	.0560508	.4221035	0.13	0.896	-.8492712	.9613727
C	-.1772242	.3134277	-0.57	0.581	-.8494598	.4950114
D	-.0390778	.3465426	-0.11	0.912	-.7823378	.7041822
E	.1430615	.3836847	0.37	0.715	-.6798603	.9659833
F	-.2403263	.3074266	-0.78	0.447	-.8996907	.4190381
Quartile_Rank						
2nd	.0648496	.1264707	0.51	0.616	-.206403	.3361022
3rd	.1911154	.2707125	0.71	0.492	-.3895052	.771736
4th	-.0828086	.37224	-0.22	0.827	-.881184	.7155667
Cross_border	.4115728	.3588599	1.15	0.271	-.3581052	1.181251
Intercontintal_Deal	-.3422215	.252219	-1.36	0.196	-.8831776	.1987345
CommonTies	-.0275588	.225564	-0.12	0.904	-.5113454	.4562278
Local_partner_used	.2149853	.2927462	0.73	0.475	-.4128928	.8428634
_cons	-.5677577	.4881096	-1.16	0.264	-1.614649	.4791332

Regression 3: EBITDA/Assets difference – deal-level

Linear regression

Number of obs	=	100	
F(9, 14)	=	.	
Prob > F	=	.	
R-squared	=	0.2954	
Root MSE	=	.34607	

(Std. Err. adjusted for 15 clusters in Target_Sector)

DifferenceEBITDAAssets	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.0021758	.0923278	-0.02	0.982	-.2001991	.1958476
3	.0497359	.1020213	0.49	0.633	-.169078	.2685498
4	.083001	.0765402	1.08	0.297	-.0811615	.2471634
5	.0695238	.0591289	1.18	0.259	-.0572951	.1963427
6	.2901163	.1859511	1.56	0.141	-.1087092	.6889417
7	-.0054636	.1029043	-0.05	0.958	-.2261715	.2152442
Target_Sector						
Construction	.103926	.184978	0.56	0.583	-.2928124	.5006643
Education, Health	.1442776	.1986868	0.73	0.480	-.2818632	.5704183
Food, beverages, tobacco	.0270814	.0586461	0.46	0.651	-.098702	.1528647
Gas, Water, Electricity	.0963103	.2034224	0.47	0.643	-.3399873	.5326079
Hotels & restaurants	.0033526	.0348407	0.10	0.925	-.0713732	.0780785
Machinery, equipment, furniture, recycl..	.0802024	.0854192	0.94	0.364	-.1030037	.2634084
Metals & metal products	.0879121	.0729893	1.20	0.248	-.0686343	.2444584
Other services	.1327752	.045084	2.95	0.011	.0360796	.2294708
Post and telecommunications	.0785695	.0525704	1.49	0.157	-.0341829	.1913218
Publishing, printing	.5365491	.2742694	1.96	0.071	-.0517004	1.124798
Textiles, wearing apparel, leather	.2800944	.0571133	4.90	0.000	.1575986	.4025902
Transport	.1426244	.1126211	1.27	0.226	-.0989239	.3841727
Wholesale & retail trade	-.048244	.0526349	-0.92	0.375	-.1611347	.0646466
Wood, cork, paper	.0278757	.0701777	0.40	0.697	-.1226405	.178392
Deal_Type						
Institutional_buyout	.3494321	.1563799	2.23	0.042	.0140306	.6848336
Minority_stake	.33907	.1602104	2.12	0.053	-.0045472	.6826871
PredealEBITDAAssets	-.5929521	.1476647	-4.02	0.001	-.9096613	-.2762429
Deal_Size						
B	-.0514097	.2289783	-0.22	0.826	-.5425194	.4397
C	-.0339691	.0594853	-0.57	0.577	-.1615522	.0936141
D	.0196983	.0838262	0.23	0.818	-.160091	.1994877
E	.1491605	.0301358	4.95	0.000	.0845256	.2137954
F	-.003915	.0776968	-0.05	0.961	-.1705581	.1627281
Quartile_Rank						
2nd	-.0349753	.0387867	-0.90	0.382	-.1181645	.0482139
3rd	.0865439	.0765655	1.13	0.277	-.0776727	.2507605
4th	-.1516661	.0777811	-1.95	0.072	-.3184899	.0151577
Cross_border	.3911632	.1967671	1.99	0.067	-.0308603	.8131868
Intercontinental_Deal	-.3946036	.1613773	-2.45	0.028	-.7407235	-.0484836
CommonTies	.1115395	.0721816	1.55	0.145	-.0432747	.2663538
Local_partner_used	.1522303	.0596038	2.55	0.023	.0243928	.2800678
_cons	-.8592164	.3593019	-2.39	0.031	-1.629842	-.0885904

Regression 3a: EBITDA/Assets difference – deal-level (MBO, no quartile)

Linear regression

Number of obs	=	594	
F(15, 16)	=	.	
Prob > F	=	.	
R-squared	=	0.0571	
Root MSE	=	1.1156	

(Std. Err. adjusted for 17 clusters in Target_Sector)

DifferenceEBITDAAssets	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.0206963	.0462024	-0.45	0.660	-.118641	.0772485
3	.0507602	.0442588	1.15	0.268	-.0430642	.1445846
4	.0463599	.0433753	1.07	0.301	-.0455916	.1383113
5	.0497102	.0477936	1.04	0.314	-.0516077	.1510281
6	.0591038	.0764193	0.77	0.451	-.1028979	.2211056
7	.418058	.3228444	1.29	0.214	-.2663416	1.102458
Target_Sector						
Construction	.1131837	.1093112	1.04	0.316	-.1185457	.3449132
Education, Health	.0129985	.009471	1.37	0.189	-.0070792	.0330761
Food, beverages, tobacco	.0782726	.0921452	0.85	0.408	-.1170664	.2736117
Gas, Water, Electricity	-.1627211	.0966559	-1.68	0.112	-.3676224	.0421802
Hotels & restaurants	-.1427577	.0850408	-1.68	0.113	-.3230361	.0375208
Insurance companies	-.2458338	.1302457	-1.89	0.077	-.5219424	.0302748
Machinery, equipment, furniture, recycl..	.0399719	.0454941	0.88	0.393	-.0564712	.1364151
Metals & metal products	.0382057	.09204	0.42	0.684	-.1569104	.2333218
Other services	.146548	.0115348	12.70	0.000	.1220953	.1710007
Post and telecommunications	.0482624	.0705874	0.68	0.504	-.1013761	.197901
Primary Sector (agriculture, mining, e..)	-.1286942	.0840274	-1.53	0.145	-.3068242	.0494359
Publishing, printing	.0560514	.0311407	1.80	0.091	-.0099639	.1220666
Textiles, wearing apparel, leather	.041851	.0325942	1.28	0.217	-.0272457	.1109477
Transport	-.0240896	.0157593	-1.53	0.146	-.0574979	.0093187
Wholesale & retail trade	-.0158748	.0153456	-1.03	0.316	-.0484061	.0166565
Wood, cork, paper	-.0147719	.01162	-1.27	0.222	-.0394053	.0098614
Deal_Type						
Acquisition	.059944	.0844756	0.71	0.488	-.1191363	.2390243
Capital_raise	-.0297786	.0864604	-0.34	0.735	-.2130665	.1535094
Institutional_buyout	.1366097	.1411545	0.97	0.348	-.1626246	.4358439
MBO	-.2499914	.2748723	-0.91	0.377	-.8326945	.3327118
PredealEBITDAAssets	-.6332616	.1741641	-3.64	0.002	-1.002473	-.2640503
Deal_Size						
B	-.055168	.0772682	-0.71	0.486	-.2189692	.1086331
C	-.0113798	.0385145	-0.30	0.771	-.093027	.0702674
D	.1977173	.1541131	1.28	0.218	-.1289879	.5244225
E	.0185456	.035706	0.52	0.611	-.0571477	.0942389
F	-.0858162	.0942423	-0.91	0.376	-.2856009	.1139685
Cross_border	.4020799	.324495	1.24	0.233	-.2858186	1.089979
Intercontintal_Deal	-.2135395	.0728638	-2.93	0.010	-.3680039	-.0590751
CommonTies	-.0320499	.0252683	-1.27	0.223	-.0856162	.0215164
Local_partner_used	.7418841	.5864957	1.26	0.224	-.5014312	1.985199
_cons	-.5358924	.491471	-1.09	0.292	-1.577764	.5059795

Regression 4: Revenue/Assets difference – deal-level

Linear regression

Number of obs	=	100	
F(9, 14)	=	.	
Prob > F	=	.	
R-squared	=	0.2242	
Root MSE	=	.75279	

(Std. Err. adjusted for 15 clusters in Target_Sector)

DifferenceRevenueAssets	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	.1089793	.2288383	0.48	0.641	-.3818301	.5997886
3	.0104133	.49001	0.02	0.983	-1.040554	1.06138
4	.4440892	.2800652	1.59	0.135	-.1565908	1.044769
5	.0226068	.233749	0.10	0.924	-.478735	.5239485
6	.34889	.1502148	2.32	0.036	.0267114	.6710687
7	-.0503306	.2802562	-0.18	0.860	-.6514205	.5507593
Target_Sector						
Construction	.6505177	.2861379	2.27	0.039	.0368129	1.264223
Education, Health	.5156656	.3629198	1.42	0.177	-.2627199	1.294051
Food, beverages, tobacco	-.1116538	.0918147	-1.22	0.244	-.3085767	.085269
Gas, Water, Electricity	.6808553	.5625657	1.21	0.246	-.5257281	1.887439
Hotels & restaurants	-.1089561	.150731	-0.72	0.482	-.4322419	.2143296
Machinery, equipment, furniture, recycl..	.1985223	.1817287	1.09	0.293	-.1912471	.5882916
Metals & metal products	-.0722958	.1347753	-0.54	0.600	-.36136	.2167685
Other services	.1879325	.1552097	1.21	0.246	-.1449591	.5208241
Post and telecommunications	-.1061573	.1610261	-0.66	0.520	-.4515238	.2392092
Publishing, printing	1.196469	.4726787	2.53	0.024	.1826741	2.210264
Textiles, wearing apparel, leather	.031998	.1398166	0.23	0.822	-.2678788	.3318748
Transport	.0097612	.2033599	0.05	0.962	-.4264024	.4459248
Wholesale & retail trade	.0412825	.3177171	0.13	0.898	-.640153	.722718
Wood, cork, paper	.3772461	.1874804	2.01	0.064	-.0248594	.7793516
Deal_Type						
Institutional_buyout	1.112861	.5803817	1.92	0.076	-.1319338	2.357656
Minority_stake	1.296402	.479266	2.70	0.017	.2684784	2.324325
PredealEBITDAAssets	-1.057502	.1428173	-7.40	0.000	-1.363814	-.7511889
Deal_Size						
B	-.260822	.3681978	-0.71	0.490	-1.050528	.5288838
C	.0582063	.1694957	0.34	0.736	-.3053258	.4217384
D	-.1674735	.2817682	-0.59	0.562	-.7718062	.4368592
E	.0049899	.1853768	0.03	0.979	-.3926039	.4025837
F	-.0723702	.1727393	-0.42	0.682	-.4428591	.2981187
Quartile_Rank						
2nd	.2550845	.125689	2.03	0.062	-.0144915	.5246605
3rd	.5197645	.3012732	1.73	0.106	-.1264023	1.165931
4th	-.0095961	.1706769	-0.06	0.956	-.3756617	.3564694
Cross_border	1.317102	.3874521	3.40	0.004	.4861003	2.148105
Intercontinental_Deal	-.582116	.2220265	-2.62	0.020	-1.058316	-.1059165
CommonTies	.0271147	.1099994	0.25	0.809	-.2088106	.2630401
Local_partner_used	.1970925	.1650712	1.19	0.252	-.15695	.5511349
_cons	-2.711993	1.047802	-2.59	0.021	-4.959306	-.4646806

Regression 4a : Revenue/Assets difference – deal-level (MBO, no quartile)

Linear regression

Number of obs	=	594	
F(15, 16)	=	.	
Prob > F	=	.	
R-squared	=	0.0824	
Root MSE	=	.48673	

(Std. Err. adjusted for 17 clusters in Target_Sector)

DifferenceRevenueAssets	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.0290659	.0703449	-0.41	0.685	-.1781905	.1200586
3	-.0259337	.1062546	-0.24	0.810	-.2511833	.1993159
4	.0039692	.0688712	0.06	0.955	-.1420313	.1499696
5	-.0592653	.0901999	-0.66	0.520	-.2504804	.1319499
6	-.0598336	.0488763	-1.22	0.239	-.1634468	.0437796
7	-.0021833	.0548283	-0.04	0.969	-.1184141	.1140475
Target_Sector						
Construction	.0687195	.0386164	1.78	0.094	-.0131435	.1505826
Education, Health	.0279287	.0072566	3.85	0.001	.0125455	.0433119
Food, beverages, tobacco	-.0152871	.0223883	-0.68	0.504	-.0627483	.0321741
Gas, Water, Electricity	-.0706748	.0176745	-4.00	0.001	-.1081431	-.0332065
Hotels & restaurants	-.0718768	.0175825	-4.09	0.001	-.1091501	-.0346034
Insurance companies	.0290063	.0337131	0.86	0.402	-.0424624	.1004749
Machinery, equipment, furniture, recycl..	-.0050893	.0193743	-0.26	0.796	-.0461611	.0359825
Metals & metal products	-.065454	.0187277	-3.50	0.003	-.105155	-.025753
Other services	.0414947	.0132314	3.14	0.006	.0134453	.0695441
Post and telecommunications	-.0256115	.0150457	-1.70	0.108	-.0575069	.006284
Primary Sector (agriculture, mining, e..)	.1538723	.0327628	4.70	0.000	.0844183	.2233263
Publishing, printing	-.040958	.0275852	-1.48	0.157	-.0994361	.0175201
Textiles, wearing apparel, leather	-.0356431	.0325321	-1.10	0.289	-.1046082	.0333219
Transport	-.0288699	.0092889	-3.11	0.007	-.0485616	-.0091783
Wholesale & retail trade	.0265018	.0286583	0.92	0.369	-.034251	.0872547
Wood, cork, paper	.1768002	.0211228	8.37	0.000	.1320219	.2215785
Deal_Type						
Acquisition	.0179572	.0165431	1.09	0.294	-.0171125	.0530269
Capital_raise	-.0363932	.0251941	-1.44	0.168	-.0898024	.017016
Institutional_buyout	.0391358	.0566252	0.69	0.499	-.0809042	.1591757
MBO	-.0935197	.0861069	-1.09	0.294	-.2760582	.0890189
PredealEBITDAAssets	-.8196715	.0954759	-8.59	0.000	-1.022071	-.6172718
Deal_Size						
B	-.0292453	.0371232	-0.79	0.442	-.1079429	.0494523
C	-.0616222	.0731392	-0.84	0.412	-.2166703	.093426
D	-.0144321	.0395112	-0.37	0.720	-.0981921	.0693278
E	.0578231	.072796	0.79	0.439	-.0964974	.2121437
F	.0483295	.0527893	0.92	0.374	-.063579	.1602379
Cross_border	.2823801	.1336213	2.11	0.051	-.0008844	.5656446
Intercontintal_Deal	-.0961255	.0702991	-1.37	0.190	-.2451528	.0529019
CommonTies	-.0173289	.0395661	-0.44	0.667	-.1012052	.0665475
Local_partner_used	.1282971	.1042772	1.23	0.236	-.0927606	.3493549
_cons	-.1873186	.1393897	-1.34	0.198	-.4828115	.1081743

Regression 5: EBITDA/Assets difference – deal-level, marginal effects via Linear Probability Model

```
Average marginal effects                        Number of obs     =        100
Model VCE    : Robust

Expression   : Linear prediction, predict()
dy/dx w.r.t. : 3.Target_Sector 4.Target_Sector 5.Target_Sector 6.Target_Sector 7.Target_Sector
               9.Target_Sector 10.Target_Sector 11.Target_Sector 12.Target_Sector 15.Target_Sector
               16.Target_Sector 17.Target_Sector 18.Target_Sector 19.Target_Sector 4.Deal_Type 6.Deal_Type
               PredealEBITDAAssets 1332.Deal_Size 1333.Deal_Size 1334.Deal_Size 1335.Deal_Size
               1336.Deal_Size 2.Quartile_Rank 3.Quartile_Rank 4.Quartile_Rank Cross_border
               Intercontintal_Deal CommonTies Local_partner_used
```

	Delta-method dy/dx	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Target_Sector						
Construction	-.1870782	.1242262	-1.51	0.154	-.4535169	.0793605
Education, Health	-.2554746	.1487696	-1.72	0.108	-.5745536	.0636043
Food, beverages, tobacco	.0015383	.0500842	0.03	0.976	-.1058816	.1089582
Gas, Water, Electricity	.9660823	.2326492	4.15	0.001	.4670995	1.465065
Hotels & restaurants	.3605093	.1822891	1.98	0.068	-.030462	.7514805
Machinery, equipment, furniture, recycl..	.1806411	.0588106	3.07	0.008	.0545048	.3067774
Metals & metal products	.2300184	.1191176	1.93	0.074	-.0254634	.4855001
Other services	.0736296	.0607661	1.21	0.246	-.0567008	.20396
Post and telecommunications	-.207436	.0807697	-2.57	0.022	-.3806697	-.0342023
Publishing, printing	.4760283	.2157825	2.21	0.045	.0132208	.9388358
Textiles, wearing apparel, leather	.5657987	.0983797	5.75	0.000	.3547953	.7768021
Transport	.6718338	.1430098	4.70	0.000	.3651082	.9785595
Wholesale & retail trade	.0828889	.1147428	0.72	0.482	-.16321	.3289878
Wood, cork, paper	.7967779	.1869403	4.26	0.001	.3958309	1.197725
Deal_Type						
Institutional_buyout	-.2795772	.339114	-0.82	0.424	-1.006904	.44775
Minority_stake	-.20691	.3007809	-0.69	0.503	-.8520209	.438201
PredealEBITDAAssets	-.5683971	.2067353	-2.75	0.016	-1.0118	-.124994
Deal_Size						
B	-.024379	.2989734	-0.08	0.936	-.6656131	.6168551
C	.1470858	.2602179	0.57	0.581	-.411026	.7051976
D	.1246284	.2071119	0.60	0.557	-.3195824	.5688393
E	.113113	.2099489	0.54	0.599	-.3371827	.5634086
F	.2387312	.3097227	0.77	0.454	-.425558	.9030203
Quartile_Rank						
2nd	-.1169083	.1028357	-1.14	0.275	-.337469	.1036523
3rd	.1301408	.076022	1.71	0.109	-.0329102	.2931918
4th	-.0363952	.1707701	-0.21	0.834	-.4026607	.3298703
Cross_border	.6074954	.3650165	1.66	0.118	-.1753872	1.390378
Intercontintal_Deal	-.5884544	.1204918	-4.88	0.000	-.8468837	-.3300251
CommonTies	-.0632841	.1384361	-0.46	0.655	-.3602	.2336317
Local_partner_used	.3689163	.1864053	1.98	0.068	-.0308833	.7687158

Note: dy/dx for factor levels is the discrete change from the base level.

Regression 6: Revenue/Assets difference – deal-level, marginal effects via Linear Probability Model

```
Average marginal effects                        Number of obs     =        100
Model VCE    : Robust

Expression   : Linear prediction, predict()
dy/dx w.r.t. : 2.Year 3.Year 4.Year 5.Year 6.Year 7.Year 3.Target_Sector 4.Target_Sector 5.Target_Sector
               6.Target_Sector 7.Target_Sector 9.Target_Sector 10.Target_Sector 11.Target_Sector
               12.Target_Sector 15.Target_Sector 16.Target_Sector 17.Target_Sector 18.Target_Sector
               19.Target_Sector 4.Deal_Type 6.Deal_Type PredealEBITDAAssets 1332.Deal_Size 1333.Deal_Size
               1334.Deal_Size 1335.Deal_Size 1336.Deal_Size 2.Quartile_Rank 3.Quartile_Rank 4.Quartile_Rank
               Cross_border Intercontintal_Deal CommonTies Local_partner_used
```

	Delta-method dy/dx	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	.1351917	.2239464	0.60	0.556	-.3451256	.6155089
3	.0527685	.2232465	0.24	0.817	-.4260477	.5315847
4	.2877963	.2035077	1.41	0.179	-.1486842	.7242769
5	.228148	.1956793	1.17	0.263	-.1915423	.6478383
6	.0421854	.2224442	0.19	0.852	-.4349099	.5192806
7	-.091116	.3909926	-0.23	0.819	-.9297117	.7474796
Target_Sector						
Construction	.6862812	.120127	5.71	0.000	.4286344	.943928
Education, Health	.3181519	.2535118	1.25	0.230	-.2255768	.8618806
Food, beverages, tobacco	-.0292139	.0555513	-0.53	0.607	-.1483596	.0899319
Gas, Water, Electricity	.7156422	.2668203	2.68	0.018	.1433695	1.287915
Hotels & restaurants	-.1260375	.1898958	-0.66	0.518	-.5333236	.2812486
Machinery, equipment, furniture, recycl..	.180138	.1493394	1.21	0.248	-.1401631	.500439
Metals & metal products	-.1923291	.2239884	-0.86	0.405	-.6727364	.2880781
Other services	.0904683	.0627377	1.44	0.171	-.0440907	.2250274
Post and telecommunications	-.4957025	.0920353	-5.39	0.000	-.6930986	-.2983063
Publishing, printing	.4347969	.2562973	1.70	0.112	-.1149062	.9845
Textiles, wearing apparel, leather	-.0081999	.0849713	-0.10	0.924	-.1904452	.1740455
Transport	.2490276	.2308401	1.08	0.299	-.2460751	.7441303
Wholesale & retail trade	.1703904	.1114065	1.53	0.148	-.0685527	.4093336
Wood, cork, paper	.9198752	.2108963	4.36	0.001	.4675475	1.372203
Deal_Type						
Institutional_buyout	-.1150252	.3841872	-0.30	0.769	-.9390249	.7089744
Minority_stake	.0441808	.4875433	0.09	0.929	-1.001496	1.089857
PredealEBITDAAssets	-.5978563	.2662401	-2.25	0.041	-1.168884	-.0268281
Deal_Size						
B	-.053777	.2468403	-0.22	0.831	-.5831968	.4756428
C	.2040411	.3299972	0.62	0.546	-.5037326	.9118148
D	.0632738	.1674332	0.38	0.711	-.2958346	.4223823
E	-.0188358	.1934265	-0.10	0.924	-.4336944	.3960228
F	.2485751	.2520167	0.99	0.341	-.2919471	.7890972
Quartile_Rank						
2nd	.0953586	.0859182	1.11	0.286	-.0889176	.2796347
3rd	.2218474	.157227	1.41	0.180	-.1153709	.5590657
4th	-.0827689	.1964119	-0.42	0.680	-.5040306	.3384928
Cross_border	1.526102	.5259091	2.90	0.012	.3981396	2.654065
Intercontintal_Deal	-.7175652	.1127361	-6.36	0.000	-.9593602	-.4757703
CommonTies	-.0189933	.2009238	-0.09	0.926	-.4499321	.4119454
Local_partner_used	.242414	.1842127	1.32	0.209	-.152683	.637511

Regression 7-12 – Fund-level analyses

Regression 7: EBITDA Index Log – Fund-level

Linear regression

Number of obs	= 156
F(11, 15)	= .
Prob > F	= .
R-squared	= 0.4394
Root MSE	= .96149

(Std. Err. adjusted for 16 clusters in Target_Sector)

EBITDAincrease_Index_Log	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Target_Country						
AU	.88364	.9068733	0.97	0.345	-1.049315	2.816595
BE	1.526308	.5013884	3.04	0.008	.4576235	2.594991
DE	1.657353	.7327596	2.26	0.039	.0955131	3.219193
EE	.9250289	1.115833	0.83	0.420	-1.453312	3.30337
ES	1.122346	.8232019	1.36	0.193	-.6322671	2.87696
FR	1.170079	.7203321	1.62	0.125	-.3652722	2.705431
GB	.8420303	.7841375	1.07	0.300	-.8293193	2.51338
IN	1.343183	.8839374	1.52	0.149	-.5408851	3.227251
IT	.7073023	.8658535	0.82	0.427	-1.138221	2.552825
KR	.3419169	.7547906	0.45	0.657	-1.266881	1.950715
LU	2.649566	.7160839	3.70	0.002	1.123269	4.175863
NL	.9478006	.7941063	1.19	0.251	-.744797	2.640398
NO	1.00003	.5487004	1.82	0.088	-.1694972	2.169557
PT	1.584165	.8479927	1.87	0.081	-.2232891	3.391618
SE	2.148727	1.34669	1.60	0.131	-.7216754	5.019129
VN	.9094832	.9733261	0.93	0.365	-1.165112	2.984079
Year						
2	-.668004	.4788005	-1.40	0.183	-1.688543	.352535
3	-.3925232	.284256	-1.38	0.188	-.9984005	.2133541
4	-.544211	.4405573	-1.24	0.236	-1.483237	.3948147
5	-.180932	.4421347	-0.41	0.688	-1.12332	.7614557
6	.2307591	.2646998	0.87	0.397	-.3334352	.7949534
7	.5143474	.5392198	0.95	0.355	-.6349724	1.663667
Target_Sector						
Construction	-2.188917	.5060397	-4.33	0.001	-3.267515	-1.110319
Education, Health	.1815161	.3391797	0.54	0.600	-.5414284	.9044606
Food, beverages, tobacco	.1692096	.1869274	0.91	0.380	-.2292168	.567636
Gas, Water, Electricity	-.5916994	.2712244	-2.18	0.045	-1.169801	-.0135982
Hotels & restaurants	.3299884	.3014006	1.09	0.291	-.3124317	.9724086
Insurance companies	.2082252	.9312202	0.22	0.826	-1.776624	2.193074
Machinery, equipment, furniture, recycl..	.1813559	.2184679	0.83	0.419	-.2842975	.6470092
Metals & metal products	.1325691	.3089857	0.43	0.674	-.5260182	.7911565
Other services	.350753	.1730401	2.03	0.061	-.0180732	.7195793
Post and telecommunications	-.0112301	.2216417	-0.05	0.960	-.4836482	.461188
Publishing, printing	.9713924	.6992075	1.39	0.185	-.5189332	2.461718
Textiles, wearing apparel, leather	2.492952	.8133195	3.07	0.008	.7594026	4.226501
Transport	1.069017	1.016243	1.05	0.309	-1.097053	3.235087
Wholesale & retail trade	-.161556	.1627809	-0.99	0.337	-.5085152	.1854033
Wood, cork, paper	.4936787	.5502215	0.90	0.384	-.6790906	1.666448
Deal_Type						
Institutional_buyout	-.5558556	.754458	-0.74	0.473	-2.163945	1.052234
Minority_stake	-.4280565	.5784966	-0.74	0.471	-1.661093	.8049798
Fund_Strategy						
Fund of Funds	.2805547	.2680036	1.05	0.312	-.2906815	.851791
Growth	-.3741888	.257345	-1.45	0.167	-.9227067	.1743291
Other	.6900826	.4971481	1.39	0.185	-.3695635	1.749729
PredealEBITDAAssets	-.2032572	.1847435	-1.10	0.289	-.5970286	.1905142
Deal_Size						
B	-.0470113	.2913415	-0.16	0.874	-.6679909	.5739683
C	-.2607485	.4695306	-0.56	0.587	-1.261529	.7400322
D	.0435598	.3185945	0.14	0.893	-.6355083	.7226279
E	.2871359	.2811374	1.02	0.323	-.3120942	.886366
F	-.2046635	.613414	-0.33	0.743	-1.512124	1.102797
Quartile_Rank						
2nd	.4105096	.2752925	1.49	0.157	-.1762624	.9972817
3rd	.2981702	.1268056	2.35	0.033	.0278905	.56845
4th	-.3035795	.4698821	-0.65	0.528	-1.30511	.6979505
Intercontintal_Deal	-.6912055	.5540399	-1.25	0.231	-1.872114	.4897026
Coinvestment	.3044314	.2113597	1.44	0.170	-.1460711	.7549338
Fund_number_series	-.0406529	.0371742	-1.09	0.291	-.1198879	.0385821
Fund_number_overall	-.0137048	.0107823	-1.27	0.223	-.0366868	.0092772
LNFundsize	-.0368391	.0832748	-0.44	0.665	-.2143351	.1406569
Regional_Diversified	-.0118111	.2752765	-0.04	0.966	-.5985491	.5749269
Industry_Diversified	.6362849	.2432538	2.62	0.019	.1178016	1.154768
_cons	-.6726455	1.387323	-0.48	0.635	-3.629654	2.284363

Regression 8: Revenue Index Log – Fund-level

Linear regression

Number of obs	=	156
F(11, 15)	=	.
Prob > F	=	.
R-squared	=	0.3325
Root MSE	=	.50284

(Std. Err. adjusted for 16 clusters in Target_Sector)

Revenueincrease_Index_Log	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Target_Country						
AU	-.0468719	.2912914	-0.16	0.874	-.6677448	.5740009
BE	.1188646	.1603522	0.74	0.470	-.222918	.4606472
DE	.1024962	.3016141	0.34	0.739	-.540379	.7453715
EE	.5457248	.4397821	1.24	0.234	-.3916486	1.483098
ES	.1530353	.3137203	0.49	0.633	-.5156437	.8217143
FR	-.0526266	.3814538	-0.14	0.892	-.8656761	.7604229
GB	-.0369826	.3215023	-0.12	0.910	-.7222485	.6482834
IN	.1623971	.388345	0.42	0.682	-.6653406	.9901348
IT	-.2507784	.2581987	-0.97	0.347	-.8011159	.2995591
KR	-.0462995	.3548538	-0.13	0.898	-.8026525	.7100536
LU	.0853406	.2992098	0.29	0.779	-.5524099	.7230912
NL	.0292766	.3529407	0.08	0.935	-.7229986	.7815519
NO	-.0993353	.1633566	-0.61	0.552	-.4475217	.2488511
PT	.0777219	.19908	0.39	0.702	-.3466071	.5020509
SE	.0593341	.2728397	0.22	0.831	-.52221	.6408782
VN	-.3138604	.4304086	-0.73	0.477	-1.231255	.6035338
Year						
2	-.2074503	.2597596	-0.80	0.437	-.7611148	.3462141
3	-.057686	.1786528	-0.32	0.751	-.4384753	.3231034
4	.1181012	.1446489	0.82	0.427	-.1902107	.4264131
5	.12821	.16583	0.77	0.451	-.2252483	.4816683
6	.1957268	.0963375	2.03	0.060	-.0096118	.4010653
7	-.0099181	.12282	-0.08	0.937	-.2717028	.2518665
Target_Sector						
Construction	.3005975	.1909379	1.57	0.136	-.106377	.707572
Education, Health	.3463765	.165645	2.09	0.054	-.0066876	.6994405
Food, beverages, tobacco	.2070789	.1125811	1.84	0.086	-.0328819	.4470398
Gas, Water, Electricity	-.2796221	.1503552	-1.86	0.083	-.6000967	.0408525
Hotels & restaurants	.2202311	.2114678	1.04	0.314	-.2305018	.6709641
Insurance companies	.4593604	.3598391	1.28	0.221	-.3076185	1.226339
Machinery, equipment, furniture, recycl..	.1220913	.1123679	1.09	0.294	-.1174153	.3615979
Metals & metal products	.29074	.2291034	1.27	0.224	-.1975823	.7790622
Other services	.1527623	.0430827	3.55	0.003	.0609336	.244591
Post and telecommunications	-.3105029	.1331205	-2.33	0.034	-.5942426	-.0267633
Publishing, printing	.2183219	.330127	0.66	0.518	-.4853272	.9219711
Textiles, wearing apparel, leather	1.244252	.4355626	2.86	0.012	.3158723	2.172632
Transport	.3959334	.6801103	0.58	0.569	-1.053687	1.845554
Wholesale & retail trade	.1790677	.0953813	1.88	0.080	-.0242326	.3823681
Wood, cork, paper	.2564677	.1813439	1.41	0.178	-.1300577	.642993
Deal_Type						
Institutional_buyout	.0084476	.2378714	0.04	0.972	-.4985634	.5154586
Minority_stake	.0867165	.2035912	0.43	0.676	-.3472279	.520661
Fund_Strategy						
Fund of Funds	-.2235191	.2552491	-0.88	0.395	-.7675698	.3205316
Growth	.0691649	.1531749	0.45	0.658	-.2573197	.3956494
Other	-.117304	.4619998	-0.25	0.803	-1.102033	.8674253
PredealEBITDAAssets	.1121267	.215554	0.52	0.611	-.3473158	.5715692
Deal_Size						
B	.0520175	.1341077	0.39	0.704	-.2338262	.3378612
C	-.1348417	.2273579	-0.59	0.562	-.6194436	.3497603
D	.0169445	.212863	0.08	0.938	-.4367623	.4706513
E	.0440706	.1614357	0.27	0.789	-.3000215	.3881627
F	-.0511405	.4238827	-0.12	0.906	-.9546251	.8523441
Quartile_Rank						
2nd	.2105555	.1171758	1.80	0.093	-.0391989	.46031
3rd	.2652306	.0856834	3.10	0.007	.0826009	.4478604
4th	.0779587	.1321676	0.59	0.564	-.2037499	.3596674
Intercontintal_Deal	-.2764944	.2714318	-1.02	0.325	-.8550376	.3020489
Coinvestment	-.0273732	.1000018	-0.27	0.788	-.2405219	.1857755
Fund_number_series	.0254778	.0152849	1.67	0.116	-.0071013	.0580569
Fund_number_overall	-.0017871	.0060817	-0.29	0.773	-.0147499	.0111756
LNFundsize	-.0478622	.0677985	-0.71	0.491	-.1923713	.096647
Regional_Diversified	.1674502	.0927406	1.81	0.091	-.0302216	.3651221
Industry_Diversified	.1931598	.1536692	1.26	0.228	-.1343785	.5206981
_cons	-.3043777	.7866059	-0.39	0.704	-1.980989	1.372233

Regression 9: EBITDA/Assets difference – deal-level

Linear regression

Number of obs	=	156	
F(11, 15)	=	.	
Prob > F	=	.	
R-squared	=	0.2961	
Root MSE	=	.28992	

(Std. Err. adjusted for 16 clusters in Target_Sector)

DifferenceEBITDAAssets	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.0501121	.0461924	-1.08	0.295	-.1485689	.0483446
3	-.0928211	.0891021	-1.04	0.314	-.2827378	.0970956
4	-.0163743	.0630051	-0.26	0.798	-.1506665	.1179179
5	-.0688953	.0576553	-1.19	0.251	-.1917847	.0539941
6	.1094074	.0722392	1.51	0.151	-.0445669	.2633817
7	.0235022	.0672706	0.35	0.732	-.1198817	.1668861
Target_Country						
AU	.1813604	.1269368	1.43	0.174	-.089199	.4519198
BE	.1754461	.0552115	3.18	0.006	.0577656	.2931267
DE	.2356617	.1408129	1.67	0.115	-.0644738	.5357973
EE	.1695987	.1501967	1.13	0.277	-.1505379	.4897354
ES	.1903502	.0880178	2.16	0.047	.0027446	.3779558
FR	.1748792	.1068879	1.64	0.123	-.052947	.4027054
GB	.2166347	.1060565	2.04	0.059	-.0094193	.4426888
IN	.205305	.1073799	1.91	0.075	-.0235699	.4341798
IT	.0200657	.0888452	0.23	0.824	-.1693034	.2094348
KR	.0726292	.1399526	0.52	0.611	-.2256727	.3709312
LU	.2602151	.1732667	1.50	0.154	-.1090941	.6295244
NL	.2171165	.1041989	2.08	0.055	-.0049782	.4392112
NO	.0530335	.0733654	0.72	0.481	-.1033412	.2094082
PT	.1601222	.1111146	1.44	0.170	-.0767129	.3969573
SE	.1826794	.1578337	1.16	0.265	-.1537352	.519094
VN	.3102052	.1472738	2.11	0.052	-.0037014	.6241118
Target_Sector						
Construction	-.0880827	.0722963	-1.22	0.242	-.2421787	.0660133
Education, Health	.0449675	.0532575	0.84	0.412	-.0685482	.1584831
Food, beverages, tobacco	-.0559625	.0102253	-5.47	0.000	-.0777573	-.0341677
Gas, Water, Electricity	-.0273655	.0349099	-0.78	0.445	-.1017742	.0470432
Hotels & restaurants	-.0790953	.0562271	-1.41	0.180	-.1989405	.0407499
Insurance companies	.1013412	.0490192	2.07	0.056	-.0031408	.2058231
Machinery, equipment, furniture, recycl..	.0284948	.0331523	0.86	0.404	-.0421675	.0991572
Metals & metal products	.0187824	.047523	0.40	0.698	-.0825104	.1200753
Other services	.0399374	.0421069	0.95	0.358	-.0498114	.1296861
Post and telecommunications	-.0637716	.0350553	-1.82	0.089	-.1384903	.010947
Publishing, printing	.0993946	.047952	2.07	0.056	-.0028126	.2016019
Textiles, wearing apparel, leather	.2639442	.0243685	10.83	0.000	.212004	.3158844
Transport	.1920783	.1343469	1.43	0.173	-.0942754	.478432
Wholesale & retail trade	-.0458104	.0513705	-0.89	0.387	-.1553041	.0636833
Wood, cork, paper	-.0201774	.0789624	-0.26	0.802	-.1884817	.1481269
Deal_Type						
Institutional_buyout	-.0171905	.1374857	-0.13	0.902	-.3102342	.2758533
Minority_stake	-.0432824	.1229434	-0.35	0.730	-.3053302	.2187653
Fund_Strategy						
Fund of Funds	.0673427	.0454382	1.48	0.159	-.0295066	.164192
Growth	.0021245	.042865	0.05	0.961	-.08924	.0934891
Other	-.0201845	.0799902	-0.25	0.804	-.1906795	.1503105
PredealEBITDAAssets	-.5237923	.0434817	-12.05	0.000	-.6164715	-.4311132
Deal_Size						
B	-.0489094	.0562933	-0.87	0.399	-.1688958	.0710771
C	-.0481708	.0495105	-0.97	0.346	-.1537	.0573584
D	-.0192778	.0740646	-0.26	0.798	-.1771427	.1385872
E	.0587903	.0297463	1.98	0.067	-.0046125	.122193
F	-.0349187	.0586593	-0.60	0.561	-.159948	.0901107
Quartile_Rank						
2nd	.0375263	.0368868	1.02	0.325	-.0410961	.1161487
3rd	.0662109	.0365608	1.81	0.090	-.0117165	.1441383
4th	-.0553427	.0360976	-1.53	0.146	-.132283	.0215976
Intercontinental_Deal	-.1748842	.1118046	-1.56	0.139	-.4131901	.0634218
Coinvestment	.0903622	.0675362	1.34	0.201	-.0535878	.2343122
Fund_number_series	.0173645	.0053132	3.27	0.005	.0060396	.0286894
Fund_number_overall	-.001916	.0025531	-0.75	0.465	-.0073577	.0035257
LNFundsize	-.0282606	.0130396	-2.17	0.047	-.056054	-.0004673
Regional_Diversified	.0263899	.0493536	0.53	0.601	-.0788049	.1315847
Industry_Diversified	.0964505	.0580925	1.66	0.118	-.0273708	.2202719
_cons	-.0518421	.135743	-0.38	0.708	-.3411714	.2374872

Regression 10: Revenue/Assets difference – Fund-level

Linear regression

Number of obs	= 156
F(11, 15)	= .
Prob > F	= .
R-squared	= 0.3855
Root MSE	= .67251

(Std. Err. adjusted for 16 clusters in Target_Sector)

DifferenceRevenueAssets	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
Year						
2	-.0257915	.1192204	-0.22	0.832	-.2799039	.2283209
3	-.0715848	.4089408	-0.18	0.863	-.9432214	.8000517
4	.4676296	.2410817	1.94	0.071	-.0462237	.981483
5	.0490802	.2487701	0.20	0.846	-.4811608	.5793211
6	.2028413	.2309754	0.88	0.394	-.2894711	.6951538
7	.0477936	.1769115	0.27	0.791	-.3292843	.4248715
Target_Country						
AU	-.0929014	.2916764	-0.32	0.754	-.7145949	.5287921
BE	.4178202	.2501152	1.67	0.116	-.1152878	.9509281
DE	.2551274	.2500809	1.02	0.324	-.2779074	.7881622
EE	-.1369804	.261113	-0.52	0.608	-.6935297	.4195688
ES	.3111777	.2796006	1.11	0.283	-.2847768	.9071322
FR	.2046166	.3178536	0.64	0.529	-.4728722	.8821054
GB	.4088419	.3647195	1.12	0.280	-.3685393	1.186223
IN	.4698595	.3091784	1.52	0.149	-.1891387	1.128858
IT	-.3420072	.1864564	-1.83	0.087	-.7394297	.0554152
KR	.1003987	.6497017	0.15	0.879	-1.284408	1.485205
LU	-.5062596	.3593658	-1.41	0.179	-1.27223	.2597103
NL	.6271108	.3500198	1.79	0.093	-.1189388	1.37316
NO	.039204	.4334854	0.09	0.929	-.8847482	.9631562
PT	-.0046501	.2864175	-0.02	0.987	-.6151346	.6058343
SE	-.1694295	.4329086	-0.39	0.701	-1.092152	.7532934
VN	.4596169	.5235058	0.88	0.394	-.6562093	1.575443
Target_Sector						
Construction	-.7930725	.2596779	-3.05	0.008	-1.346563	-.2395821
Education, Health	.5678219	.1963719	2.89	0.011	.1492651	.9863787
Food, beverages, tobacco	-.2812326	.0846047	-3.32	0.005	-.4615633	-.1009019
Gas, Water, Electricity	-.0138391	.1687044	-0.08	0.936	-.373424	.3457458
Hotels & restaurants	-.6099231	.2294425	-2.66	0.018	-1.098968	-.1208779
Insurance companies	.4152085	.3122862	1.33	0.204	-.2504138	1.080831
Machinery, equipment, furniture, recycl..	-.0517695	.0945865	-0.55	0.592	-.2533759	.1498369
Metals & metal products	-.0035376	.2074557	-0.02	0.987	-.4457189	.4386437
Other services	-.2928863	.1703978	-1.72	0.106	-.6560807	.0703081
Post and telecommunications	-.3136601	.2887569	-1.09	0.295	-.9291309	.3018107
Publishing, printing	-.3879325	.1998879	-1.94	0.071	-.8139835	.0381184
Textiles, wearing apparel, leather	.5287886	.2465196	2.15	0.049	.0033446	1.054233
Transport	-.093432	.180861	-0.52	0.613	-.478928	.2920641
Wholesale & retail trade	-.2311327	.2471338	-0.94	0.364	-.7578859	.2956204
Wood, cork, paper	-.1441213	.2426707	-0.59	0.561	-.6613616	.3731191
Deal_Type						
Institutional_buyout	-.1346141	.1864364	-0.72	0.481	-.5319938	.2627656
Minority_stake	-.1962298	.1069522	-1.83	0.086	-.424193	.0317334
Fund_Strategy						
Fund of Funds	-.3282916	.3772851	-0.87	0.398	-1.132456	.4758724
Growth	.0408196	.2118468	0.19	0.850	-.4107212	.4923603
Other	-.295358	.4833684	-0.61	0.550	-1.325633	.7349173
PredealEBITDAAssets	-1.159157	.1940665	-5.97	0.000	-1.5728	-.7455139
Deal_Size						
B	-.2007711	.1873364	-1.07	0.301	-.6000691	.198527
C	.0929129	.1713653	0.54	0.596	-.2723437	.4581694
D	-.0437264	.1530932	-0.29	0.779	-.3700368	.282584
E	.0083927	.1764018	0.05	0.963	-.3675988	.3843843
F	-.0660317	.1943031	-0.34	0.739	-.4801789	.3481155
Quartile_Rank						
2nd	.1857147	.1510358	1.23	0.238	-.1362105	.5076399
3rd	.284443	.0961465	2.96	0.010	.0795117	.4893743
4th	.022513	.1578211	0.14	0.888	-.3138746	.3589007
Intercontinental_Deal	-.1797771	.2296334	-0.78	0.446	-.669229	.3096749
Coinvestment	-.0963408	.1561673	-0.62	0.547	-.4292035	.236522
Fund_number_series	.0674491	.0217808	3.10	0.007	.0210245	.1138738
Fund_number_overall	.0013761	.0064954	0.21	0.835	-.0124684	.0152207
LNFundsize	-.1499662	.0948997	-1.58	0.135	-.3522402	.0523077
Regional_Diversified	-.0786959	.1220829	-0.64	0.529	-.3389093	.1815176
Industry_Diversified	-.0640375	.1286704	-0.50	0.626	-.3382921	.210217
_cons	1.03447	.4632967	2.23	0.041	.0469761	2.021963

Regression 11: EBITDA/Assets difference – Fund-level, marginal effects via Linear Probability Model

```
Average marginal effects                        Number of obs     =        156
Model VCE    : Robust

Expression   : Linear prediction, predict()
dy/dx w.r.t. : 2.Target_Country 3.Target_Country 10.Target_Country 13.Target_Country 15.Target_Country
               17.Target_Country 18.Target_Country 22.Target_Country 23.Target_Country 25.Target_Country
               27.Target_Country 31.Target_Country 32.Target_Country 35.Target_Country 38.Target_Country
               47.Target_Country 2.Year 3.Year 4.Year 5.Year 6.Year 7.Year 3.Target_Sector 4.Target_Sector
               5.Target_Sector 6.Target_Sector 7.Target_Sector 8.Target_Sector 9.Target_Sector
               10.Target_Sector 11.Target_Sector 12.Target_Sector 15.Target_Sector 16.Target_Sector
               17.Target_Sector 18.Target_Sector 19.Target_Sector 4.Deal_Type 6.Deal_Type 2.Fund_Strategy
               3.Fund_Strategy 4.Fund_Strategy PredealEBITDAAssets 1332.Deal_Size 1333.Deal_Size
               1334.Deal_Size 1335.Deal_Size 1336.Deal_Size 2.Quartile_Rank 3.Quartile_Rank 4.Quartile_Rank
               Intercontintal_Deal Coinvestment Fund_number_series Fund_number_overall LNFundsize
               Regional_Diversified Industry_Diversified
```

	Delta-method dy/dx	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Target_Country						
AU	-.230451	.316196	-0.73	0.477	-.9044069	.4435049
BE	.7062767	.2177505	3.24	0.005	.2421525	1.170401
DE	.4973325	.3214238	1.55	0.143	-.1877662	1.182431
EE	.6748203	.2868902	2.35	0.033	.0633282	1.286312
ES	.5342567	.2341178	2.28	0.038	.0352464	1.033267
FR	.6263707	.3585009	1.75	0.101	-.1377559	1.390497
GB	.5580291	.3397033	1.64	0.121	-.1660312	1.282089
IN	.8187269	.366379	2.23	0.041	.0378085	1.599645
IT	.254088	.3424391	0.74	0.470	-.4758036	.9839796
KR	.11131	.2915644	0.38	0.708	-.5101447	.7327647
LU	1.475405	.3021083	4.88	0.000	.8314765	2.119334
NL	.901876	.3483518	2.59	0.021	.1593818	1.64437
NO	.7420065	.2229164	3.33	0.005	.2668714	1.217142
PT	.8742955	.3965968	2.20	0.044	.0289695	1.719622
SE	.4152978	.4651779	0.89	0.386	-.5762053	1.406801
VN	1.534602	.4148781	3.70	0.002	.6503102	2.418894
Year						
2	-.0390426	.1538528	-0.25	0.803	-.366972	.2888868
3	.036849	.1000695	0.37	0.718	-.1764441	.2501421
4	.2262003	.2230113	1.01	0.327	-.249137	.7015375
5	-.0550727	.2119336	-0.26	0.799	-.5067986	.3966531
6	.0337928	.135704	0.25	0.807	-.2554534	.323039
7	.0346527	.2262202	0.15	0.880	-.4475242	.5168295
Target_Sector						
Construction	-.1662363	.1786166	-0.93	0.367	-.5469486	.2144761
Education, Health	.080731	.1427421	0.57	0.580	-.2235165	.3849786
Food, beverages, tobacco	-.0580327	.0938217	-0.62	0.545	-.258009	.1419436
Gas, Water, Electricity	-.088707	.0968613	-0.92	0.374	-.2951619	.117748
Hotels & restaurants	.0063151	.1677816	0.04	0.970	-.3513029	.3639332
Insurance companies	-.2622841	.1507745	-1.74	0.102	-.5836523	.0590841
Machinery, equipment, furniture, recycl..	-.0134033	.1358051	-0.10	0.923	-.302865	.2760584
Metals & metal products	-.2299871	.1138025	-2.02	0.062	-.4725514	.0125772
Other services	-.171576	.1074289	-1.60	0.131	-.4005553	.0574032
Post and telecommunications	-.4282673	.1747784	-2.45	0.027	-.8007985	-.055736
Publishing, printing	.0151555	.2078517	0.07	0.943	-.42787	.458181
Textiles, wearing apparel, leather	.692546	.1650988	4.19	0.001	.3406463	1.044446
Transport	.4767541	.180085	2.65	0.018	.092912	.8605962
Wholesale & retail trade	-.1136543	.0565377	-2.01	0.063	-.2341615	.0068529
Wood, cork, paper	.9146887	.1784064	5.13	0.000	.5344244	1.294953
Deal_Type						
Institutional_buyout	-.6595898	.1300249	-5.07	0.000	-.9367314	-.3824482
Minority_stake	-.7206664	.1047216	-6.88	0.000	-.9438752	-.4974576
Fund_Strategy						
Fund of Funds	-.4498354	.1500642	-3.00	0.009	-.7696897	-.1299811
Growth	-.1079226	.1142237	-0.94	0.360	-.3513847	.1355396
Other	.4129442	.1670415	2.47	0.026	.0569038	.7689847
PredealEBITDAAssets	-.362748	.1198469	-3.03	0.008	-.6181955	-.1073004
Deal_Size						
B	-.0310668	.1703375	-0.18	0.858	-.3941324	.3319989
C	.0131193	.1787989	0.07	0.942	-.3679814	.39422
D	.1406096	.139327	1.01	0.329	-.1563588	.437578
E	-.0020481	.1237538	-0.02	0.987	-.265823	.2617267
F	.3226896	.2971877	1.09	0.295	-.310751	.9561301
Quartile_Rank						
2nd	.0854727	.0891178	0.96	0.353	-.1044773	.2754228
3rd	.1837949	.0804165	2.29	0.037	.0123912	.3551986
4th	.0187918	.1216711	0.15	0.879	-.2405441	.2781277
Intercontintal_Deal	-.400259	.1819038	-2.20	0.044	-.7879778	-.0125402
Coinvestment	.0107208	.1712884	0.06	0.951	-.3543717	.3758134
Fund_number_series	.0100293	.0152981	0.66	0.522	-.0225777	.0426364
Fund_number_overall	-.0064986	.0023327	-2.79	0.014	-.0114706	-.0015265
LNFundsize	-.0706587	.0684664	-1.03	0.318	-.2165914	.0752739
Regional_Diversified	-.164073	.087032	-1.89	0.079	-.3495774	.0214314
Industry_Diversified	-.087359	.0969922	-0.90	0.382	-.294093	.119375

Regression 12: Revenue/Assets difference – Fund-level, marginal effects via Linear Probability Model

```
Average marginal effects                        Number of obs     =        156
Model VCE    : Robust

Expression   : Linear prediction, predict()
dy/dx w.r.t. : 2.Target_Country 3.Target_Country 10.Target_Country 13.Target_Country 15.Target_Country
               17.Target_Country 18.Target_Country 22.Target_Country 23.Target_Country 25.Target_Country
               27.Target_Country 31.Target_Country 32.Target_Country 35.Target_Country 38.Target_Country
               47.Target_Country 2.Year 3.Year 4.Year 5.Year 6.Year 7.Year 3.Target_Sector 4.Target_Sector
               5.Target_Sector 6.Target_Sector 7.Target_Sector 8.Target_Sector 9.Target_Sector
               10.Target_Sector 11.Target_Sector 12.Target_Sector 15.Target_Sector 16.Target_Sector
               17.Target_Sector 18.Target_Sector 19.Target_Sector 4.Deal_Type 6.Deal_Type 2.Fund_Strategy
               3.Fund_Strategy 4.Fund_Strategy PredealEBITDAAssets 1332.Deal_Size 1333.Deal_Size
               1334.Deal_Size 1335.Deal_Size 1336.Deal_Size 2.Quartile_Rank 3.Quartile_Rank 4.Quartile_Rank
               Intercontintal_Deal Coinvestment Fund_number_series Fund_number_overall LNFundsize
               Regional_Diversified Industry_Diversified
```

	Delta-method dy/dx	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Target_Country						
AU	-.1190346	.3242046	-0.37	0.719	-.8100603	.5719911
BE	.5316373	.2681515	1.98	0.066	-.039914	1.103189
DE	.0616035	.266897	0.23	0.821	-.507274	.630481
EE	.6053199	.5326916	1.14	0.274	-.5300853	1.740725
ES	.6328812	.310094	2.04	0.059	-.0280685	1.293831
FR	.477228	.2737754	1.74	0.102	-.1063104	1.060766
GB	.6569746	.269041	2.44	0.027	.0835273	1.230422
IN	.6056816	.3185481	1.90	0.077	-.0732875	1.284651
IT	.2710309	.1730889	1.57	0.138	-.0978993	.6399611
KR	.4785225	.2902563	1.65	0.120	-.1401443	1.097189
LU	.3783558	.3316521	1.14	0.272	-.3285439	1.085256
NL	.8376604	.229402	3.65	0.002	.3487016	1.326619
NO	.6940164	.3892302	1.78	0.095	-.1356081	1.523641
PT	.7699122	.3446488	2.23	0.041	.0353107	1.504514
SE	.3936147	.3820989	1.03	0.319	-.42081	1.208039
VN	-.1125306	.282646	-0.40	0.696	-.7149764	.4899152
Year						
2	-.1022022	.1308019	-0.78	0.447	-.381	.1765955
3	-.1552997	.2014757	-0.77	0.453	-.584735	.2741356
4	.1367693	.1576597	0.87	0.399	-.1992743	.472813
5	.0364477	.2099678	0.17	0.865	-.4110881	.4839834
6	-.1940692	.1652029	-1.17	0.258	-.5461909	.1580524
7	-.2389266	.2601543	-0.92	0.373	-.7934325	.3155792
Target_Sector						
Construction	.0765877	.213035	0.36	0.724	-.3774858	.5306611
Education, Health	.2640679	.0949238	2.78	0.014	.0617427	.4663931
Food, beverages, tobacco	-.2536248	.0873281	-2.90	0.011	-.4397603	-.0674893
Gas, Water, Electricity	-.466759	.161061	-2.90	0.011	-.8100523	-.1234656
Hotels & restaurants	-.4124337	.176863	-2.33	0.034	-.7894083	-.035459
Insurance companies	-.1690638	.1444666	-1.17	0.260	-.476987	.1388594
Machinery, equipment, furniture, recycl..	-.071765	.1018489	-0.70	0.492	-.2888508	.1453209
Metals & metal products	-.3658913	.1409947	-2.60	0.020	-.6664143	-.0653683
Other services	-.3651601	.117248	-3.11	0.007	-.6150684	-.1152519
Post and telecommunications	-.9375208	.1862944	-5.03	0.000	-1.334598	-.5404435
Publishing, printing	-.3235622	.3661125	-0.88	0.391	-1.103912	.456788
Textiles, wearing apparel, leather	-.0709841	.1004473	-0.71	0.491	-.2850823	.1431142
Transport	-.1561257	.5364905	-0.29	0.775	-1.299628	.9873768
Wholesale & retail trade	.0339944	.0490656	0.69	0.499	-.0705864	.1385752
Wood, cork, paper	.4233749	.2351911	1.80	0.092	-.077923	.9246728
Deal_Type						
Institutional_buyout	-.6825949	.291907	-2.34	0.034	-1.30478	-.0604098
Minority_stake	-.5649185	.2478084	-2.28	0.038	-1.09311	-.0367275
Fund_Strategy						
Fund of Funds	-.1788021	.3102811	-0.58	0.573	-.8401506	.4825463
Growth	.2566402	.1817958	1.41	0.178	-.1308484	.6441288
Other	.0354887	.3110663	0.11	0.911	-.6275335	.6985109
PredealEBITDAAssets	-.6495393	.1756113	-3.70	0.002	-1.023846	-.2752328
Deal_Size						
B	.1364804	.1237436	1.10	0.287	-.1272728	.4002335
C	.5556488	.1417475	3.92	0.001	.2535211	.8577764
D	.4385495	.2208229	1.99	0.066	-.0321234	.9092225
E	.2217603	.1622019	1.37	0.192	-.1239648	.5674854
F	.5986456	.2741201	2.18	0.045	.0143723	1.182919
Quartile_Rank						
2nd	.2751377	.1295697	2.12	0.051	-.0010336	.551309
3rd	.1933809	.0836753	2.31	0.035	.0150312	.3717307
4th	.0676218	.1049375	0.64	0.529	-.1560471	.2912908
Intercontintal_Deal	-.5085011	.1801576	-2.82	0.013	-.8924979	-.1245043
Coinvestment	.0687797	.0751853	0.91	0.375	-.091474	.2290334
Fund_number_series	.022762	.0194035	1.17	0.259	-.0185956	.0641197
Fund_number_overall	-.0042074	.0039757	-1.06	0.307	-.0126814	.0042667
LNFundsize	-.0829188	.0414302	-2.00	0.064	-.171225	.0053875
Regional_Diversified	-.042858	.1038707	-0.41	0.686	-.2642531	.1785371
Industry_Diversified	-.0262495	.1741077	-0.15	0.882	-.3973513	.3448522