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Private Equity Clubs: Returns in the Financial Crisis Period

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## **Abstract**

This dissertation aims to shed some light on the U.S. private equity (PE) market, more specifically, to analyze the differences between the premiums paid by clubs of PE firms and sole PE firms during crisis periods vs non-crisis periods.

Considering a sample of 372 deals, where 76 are acquisitions that involved more than one PE firm (club deals) and 296 involved one PE firm (sole-sponsored deals), announced between 2002 and 2018, it was investigated the effect of this difference on the stock returns of publicly traded targets. Three different categories of returns were employed as dependent variables: Raw Returns, Buy-and-Hold Abnormal Returns (BHARs,) and Cumulative Abnormal Returns (CARs) divided into eight intervals.

From this study, it is possible to conclude that, when all transactions are considered without separating between prominent and non-prominent PE firms, there is no difference between the premiums paid by club deals and sole-sponsored deals. When only prominent PE firms are considered, in all intervals of the returns, the premiums paid by clubs of prominent PE firms are lower than the premiums paid by sole prominent PE firms.

In what concerns non-crisis vs crisis periods, it is concluded that the premiums paid by clubs of PE firms are not statistically different from the premiums paid by sole PE firms in a financial crisis period in both analyses.

For the entire investigation period, except in 2003, on average, the deal value is higher in club deals than in sole-sponsored deals, meaning that clubs pay higher prices for each target when compared to the cases in that there is a single PE firm acquiring the target.

**Keywords:** Private Equity, Club Deals, Financial Crisis

## Resumo

O objetivo desta dissertação é investigar o mercado de Private Equity (PE) dos Estados Unidos da América, mais especificamente, analisar as diferenças entre os prêmios pagos por clubes de empresas de PE e empresas individuais de PE ao longo de períodos de crise e de não crise.

Considerando uma amostra de 372 transações, onde 76 envolvem aquisições feitas por mais que uma empresa de PE (clubes de empresas de PE) e 296 envolvem uma aquisição feita por uma empresa de PE (empresas individuais de PE), anunciadas entre 2002 e 2008, foi investigado o efeito desta diferença nos retornos das ações de empresas públicas. Três categorias de retornos foram consideradas como variáveis dependentes: Raw Returns, Buy-and-Hold Abnormal Returns (BHARs) e Cumulative Abnormal Returns (CARs) divididas em oito intervalos.

A partir deste estudo, concluiu-se que, quando todas as transações são consideradas sem separação em empresas de PE em proeminentes e não proeminentes, não há diferenças entre os prêmios pagos por clubes de empresas e empresas individuais de PE. Quando apenas são consideradas empresas de PE proeminentes, em todos os intervalos considerados, os prêmios pagos por clubes de empresas de PE são menores do que os prêmios pagos por empresas individuais de PE.

No que diz respeito a períodos de crise e não crise, concluiu-se que os prêmios pagos por clubes de empresas de PE não são estatisticamente diferentes dos pagos por empresas individuais de PE em ambas as análises.

Em todo o período de investigação, exceto em 2003, em média, o valor das aquisições é superior quando envolve clubes de empresas de PE do que quando envolve empresas individuais de PE, o que significa que clubes de empresas de PE pagam preços superiores por cada empresa quando comparados com os casos em que é uma empresa individual de PE a fazer a aquisição.

**Palavras-Chave:** Private Equity, Clubes de Empresas, Crise Financeira

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# 1. Introduction

## 1.1. M&A and Private Equity Recent Information

Since 2000, over 790 000 Mergers&Acquisitions (M&A) transactions have been announced worldwide with a known value of over \$57 trillion (IMAA, n.d.). Concerning the number of M&A deals, in 2017 it was reached a new record of more than 52 000 transactions worldwide<sup>1</sup>.

By exploring private equity (PE) transactions in particular, it is noticed that these transactions are becoming more important over time. Public-to-Private (P2P) deals boomed around 2006/2007 and, since 2014, they are growing in popularity once again. The period between 2014 and 2018 witnessed an increase in the global P2P deal value, as well as in the number of deals carried out (Bain&Company, 2020, p. 8). In 2019, the global P2P deal value reached \$204 billion and nearly touched the 200 deals.<sup>2</sup>

In McKinsey & Company's report, published in February 2020, that explores the PE market evolution, it was revealed that the number of active<sup>3</sup> PE firms has been increasing every year since 2005, and grew especially in 2019<sup>4</sup>. PE deal volume was stable in 2019, after growing 12% per year from 2013 to 2018<sup>5</sup>, while the deal count fell considerably (13%) in all regions, after growing 8% per year from 2013 to 2018<sup>6</sup> (McKinsey&Company, 2020, p. 20; 21). This evidence shows that, even though 2019 was not the best year in terms of PE transactions, an astonishing increase not only in deal count, but in deal volume too, has been observed. The report refers, as well, that a total of \$219 billion in PE capital was raised by megafunds (\$5 billion or more), which accounts for 39% of the total PE capital raised. This figure is 3 times larger than the amount involved in 2014, confirming the rising importance of megafunds (McKinsey&Company, 2020, p. 22). In addition to this evidence, an article published in the Financial Times revealed that PE mega-deals are increasing again, especially in Europe and in the Americas, and often these deals involve the participation of clubs of PE firms (Wiggins, 2020, March 7)<sup>7</sup>.

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<sup>1</sup> For more detail, see appendix 1

<sup>2</sup> For more detail, see appendix 2

<sup>3</sup> In the report, a firm is considered active if it has raised a fund in the previous 7 years

<sup>4</sup> For more detail, see appendix 3

<sup>5</sup> For more detail, see appendix 4

<sup>6</sup> For more detail, see appendix 5

<sup>7</sup> For more detail, see appendix 6

Regarding the future of PE firms, three strategic issues for the next ten years were discussed in McKinsey & Company's report. The first one comprises investing while taking into consideration environmental, social, and governance (ESG) factors. As the public awareness regarding these factors increases, it is required now that PE firms "pass an ESG screen as part of their vetting process and demand more transparency into ESG policies, procedures, and performance of portfolio assets" (McKinsey&Company, 2020, p. 28). The second factor is related to diversity and inclusion, since the number of women and minorities are still underrepresented in the private markets, something that is changing, but still at a low pace. Finally, the third issue is related to the exploration of digital approaches and advanced analytics and creating value based on these sources, something that is already starting to be done but in a limited way.

It is important to discuss 2020 impact's in PE firms as well. 2020 will always be remembered because of the emergence of the Covid-19 pandemic and, similarly to other firms, PE firms were affected by the global health crisis. In a Financial Times article, it was revealed that "one in 10 companies owned by private equity managers is in 'intensive care' as a result of the coronavirus pandemic" and half of the companies they owned were moderately or very affected (Flood, 2020, October 10). The situation lived in 2020 carries some concerns regarding the performance of the PE firms, making rating agencies pondering about the possibility of default on highly leveraged PE-owned firms.

## **1.2. Private Equity & LBOs Structure**

PE firms are, typically, structured as a partnership or limited liability corporation, and they raise capital through a PE fund (Kaplan & Strömberg, 2009, p. 123). The purpose of these firms is to collect funds from investors and, then, to use them to acquire and restructure brand new or already existing companies.

Ultimately, PE firms are expected to be able to realize an adequate return on their investment upon exit, usually in no more than ten years. Gompers, Kaplan, and Mukharlyamov (2016, p. 474) uncovered that "PE investors typically target a return on their investments well above a CAPM-based rate", which is in tandem with the investor's belief that they add meaningful value to their investments. According to this study, in order to add value to their portfolio companies, PE investors are more concerned about increasing

revenues rather than decreasing costs<sup>8</sup>. Additionally, regarding PE performance, Buchner, Mohamed, and Schwenbacher (2016, p. 18)'s study shows that the performance of PE funds is more affected by the ability of the fund managers to minimize downside losses than by the selection of outperforming portfolio companies.

In what concerns leveraged buyouts (LBOs), this M&A vehicle emerged as an important phenomenon in the 1980s (Kaplan & Strömberg, 2009, p. 121) and is carried out, in simple words, when one firm or part of one firm is acquired through a relatively small portion of equity and a considerably large amount of leverage (debt). LBOs allow the acquisition of companies without the need to commit a great amount of capital and can be performed by the current management (Management Buyout), the employees, or by a PE firm.

DePamphilis (2017, p. 487) determined that LBOs can create value by deferring payment of taxes, improve access to capital, improving operating performance, and timing properly the sale of the business. Regarding this last property, Strömberg (2008, p. 1; 6) found that only 8% of firms stay in LBO ownership for less than two years and the median firm stays for about nine years. The author also found that, when the LBOs are sponsored by PE investors, the exit occurs earlier than in deals without financial sponsors, which happens especially because the PE firms have the need to return capital to their investors.

### **1.3. Private Equity Performance in the Crisis Periods**

The 2008 crisis was an unpredictable event that affected a variety, if not all, sectors and areas of operations. Following the conclusions of Inklaar and Yang (2012, p. 478), the decrease in the level of investment after a crisis varies across countries and is reliant on their tolerance for uncertainty. Countries that are more uncertainty-averse decline more significantly their investment relative to countries that have a higher tolerance for uncertainty. Joseph, Kneer, Horen, and Saleheen (2019, p. 24) acknowledged that having high liquidity before a crisis gives firms a competitive advantage that lasts after the crisis period: the authors uncovered that firms with high pre-crisis cash holdings were able to invest more during the financial crisis, compared to their industry rivals, and this positive

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<sup>8</sup> The sources that PE investors use to add value are, in order of importance, “increasing revenue, improving incentives and governance, facilitating a high-value exit or sale, making additional acquisitions, replacing management, and reducing costs” (Gompers et al., 2016, p. 475)

impact of relative cash was amplified during the recovery phase. This ability allowed these firms to gain market share and accumulate more profits over the long run.

PE firms were not an exception and, also, faced some challenges. However, according to the finding of Shai Bernstein, Lerner, and Mezzanotti (2019, p. 5; 6), during the financial crisis, PE-backed firms decreased investments less than non-PE-backed firms, since these firms have the ability to use resources and relationships to raise funding. The authors also concluded that PE-backed firms “do not appear to be more sensitive to the onset of the financial crisis”.

The crisis period that will be considered in this paper is the period between 2008 and 2011, which is in tandem with the study performed by Shai Bernstein et al. (2019). According to the authors, the choice of 2008 is in agreement with a sizable amount of empirical evidence (e.g., Kahle and Stulz (2013)).

#### **1.4. Available Research**

In what concerns PE firms, a key issue, and the greatest motivation for this dissertation, has to do with the differences in the premiums paid for publicly traded firms when the acquirer is one PE firm and when the acquirer consists of several PE firms (clubs of PE firms<sup>9</sup>). The available evidence concerning this phenomenon is mixed and there are two studies that lead the subject.

On the one hand, Officer, Ozbas, and Sensoy (2010, p. 237) found evidence that “target shareholders receive (...) roughly 40% lower premiums, in club deals compared to sole-sponsored LBOs” when acquired by prominent PE firms. This study uses a sample of U.S. publicly traded targets in transactions between the 1984 – 2007 period<sup>10</sup>.

On the other hand, Boone and Mulherin (2011, p. 1475; 1477) did a comparable study, since the authors employed data from both prominent and smaller PE firms, but were not able to find the same evidence. This last study includes transactions that occurred in the 2003 – 2007 period and uses a sample of U.S. publicly traded targets, as well. These authors concluded that “target abnormal returns are lower in private equity consortium deals for narrow windows around the initial takeover-related announcement date” but “these results

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<sup>9</sup> Throughout this dissertation the terms “club”, “consortium”, “alliance” and “partnership” are employed as synonyms for this event

<sup>10</sup> The authors found that this “club discount virtually disappears in 2006 and 2007”, probably due to the fact that “the financial media began expressing concerns about club deals at the end of 2005 and the U.S. Department of Justice started an informal inquiry into the practice in 2006” (Officer et al., 2010, p. 237)

do not hold for longer event windows”. In short, the authors did not find evidence that prominent PE firms or clubs of prominent PE firms have negative effects on target returns. It is important to note, subsequently, that these studies reached different conclusions in the same category of PE firms.

Some additional literature has been published after these two studies. Some reached a similar conclusion as Officer et al. (2010), such as Gygax, Hewer, and Shekhar (2012) (1990 – 2008 period) and Kim and Palia (2014) (1980 – 2009 period), and others reached comparable conclusions as Boone and Mulherin (2011), like J. X. Cao, Cumming, Qian, and Wang (2015) (1995 – 2007 period).

## 1.5. Research Relevance

Due to the conflicting pieces of evidence, the growing importance of PE transactions, and the lack of studies concerning this topic on a recent basis, this theme appears to be a relevant subject to be explored.

The focus of this paper is transactions where the buyer is a PE firm or an alliance of PE firms, and the sample incorporates targets located in the United States of America (U.S.) with an announcement date between the 2002 – 2018 period.

The main difference between this study and the other ones available at the moment is the period of analysis. Most of the studies published are focused on periods until 2007 (the year of the LBO boom<sup>11</sup>). As far as the mentioned studies involving this theme goes, this work is the first analyzing transactions happening after 2010 and making a differentiation when it comes to financial and non-financial crisis periods involving club deals, which also comprises a key expansion to the available literature.

The objective of this study is to be useful to companies, whenever deciding to sell, to be mindful of the differences in the rewards paid by PE firms. In addition, it is expected that this study can bring awareness to the firms when periods of crisis occur and to understand the impact of this phenomenon in the PE market. All in all, this work lies in the study of the differences between the prices practiced by clubs of PE firms and sole PE firms throughout crisis periods vs non-crisis periods.

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<sup>11</sup> “In 2006 and 2007, a record amount of capital was committed to private equity, both in nominal terms and as a fraction of the overall stock market” (Kaplan & Strömberg, 2009)

## **1.6. Contributions to the literature**

This paper aims to be found among other works on the characteristics of PE transactions, more specifically in the pricing and features of club deals section, in the broader literature. Moreover, this study aspires to bring information regarding LBOs and contribute to that literature section as well as to shed light on the prices paid in financial and non-financial crisis periods.

In the analysis period, the world experienced a major crisis, specifically, the 2008 financial crisis. As this event was large and impacted almost all areas, it is relevant to understand if this occurrence influences this topic as well. For this reason, it was considered important to conduct a more recent study regarding this concern, in order to be able to see the impact and consequences of this crisis from the PE firm and target's perspective. Additionally, this topic is relevant because, at the moment, the world is going through a crisis and this study can offer not only some important insights about the analyzed period but also contribute to taking advantage of such a difficult time.

As a final purpose, the greatest contribution of this study to the PE literature is the fact that it will update previous works focused on club deals such as Officer et al. (2010) and Boone and Mulherin (2011).

## **1.7. Methodology**

Regarding the methodology to be used throughout this study, the objective is to be similar to the methodology performed by Officer et al. (2010), this is, there were collected daily return data for each target and then constructed the Raw Returns, Buy-and-Hold Abnormal Returns (BHARs) and Cumulative Abnormal Returns (CARs) to be able to compare the target returns by bidder type. However, differently, these returns were analyzed depending on the period (non-financial vs financial crisis periods) and were employed in eight intervals whereas the authors only considered three.

The sample, similar to the authors, englobes the U.S. publicly traded target firms, and only PE-sponsored deals are analyzed, and includes completed-confirmed deals between 01/01/2002 and 31/12/2018. As opposed to the authors, restrictions to the deal value were

not added. Furthermore, were not considered only PE-sponsored LBOs deals but, instead, all deals and, then, used a dummy variable to understand the impact of these transactions.<sup>12</sup>

In the first phase of this study, all transactions are considered without separating between prominent and non-prominent PE firms as the authors decided to do. In the second phase, subsequently and separately, this distinction is made. In addition, instead of separating into 4 types of acquisitions (PE clubs, sole PE firms, private firms that are not prominent PE firms, and public firms), this work only considered 2 types (PE clubs and sole PE firms).

The database of choice is *Zephyr*, a database of deal information that is updated hourly and is offered by Bureau van Dijk Company for corporate finance research. This database comprehends data on M&A, IPO, PE, and venture capital deals and rumors<sup>13</sup>.

## 1.8. Research Questions

This study was conducted having into consideration three big research questions:

**H1:** Premiums paid by clubs of PE firms are higher than the ones paid by sole-sponsored PE firms in the sample considered period (2002 – 2018).

**H2:** Premiums paid by clubs of PE firms are higher than the ones paid by sole-sponsored PE firms in the financial crisis period (2008 – 2011).

**H3:** On average, the deal value in club deals is higher than in sole-sponsored deals.

## 1.9. Dissertation's Structure

This work will proceed as follows. Section 2 presents relevant related literature about PE, LBOs, and club deals. Section 3 describes the sample that will be used and specifies a summary of the statistics involving the sample. In section 4 it will be described the regression to be used during the study in order to understand the impact of club and sole-sponsored deals on target returns. Finally, section 5 will include the main conclusions of the analysis and the limitations of the research.

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<sup>12</sup> It is important to mention that, even though all deals will be taken into account, it will be analyzed the impact (if existent) of PE-sponsored LBOs transactions compared to other types of transactions since LBOs transactions are a subject of interest to this paper, due to the fact that some of the studies carried out on this topic only consider these category of deals (e.g. Officer et al. (2010), Gygas et al. (2012) and J. X. Cao et al. (2015))

<sup>13</sup> To access more information regarding the *Zephyr* database: [bvinfo.com](http://bvinfo.com)

## 2. Theoretical Framework & Literature Review

### 2.1. Private Equity Firms & Funds

PE firms pool investor's capital through PE funds and actively invest these resources in different firms, bearing in mind the potential long-term performance of the target firms.

Commonly, PE funds are closed-ended, this is, they do not permit the investors to withdraw their investment until the fund is closed. Regarding the investment made, the PE fund manager is not obliged to invest the money received immediately but, instead, the manager has an investment period of up to five years. This flexibility allows the manager to invest at his discretion, having the opportunity to time the markets, in order to achieve a better return. According to the findings of Jenkinson, Morkoetter, and Wetzler (2018, p. 1; 21), on average, PE fund managers are capable of adding value by timing the market successfully, since they sell their portfolio when market multiples are higher than at the time of the investment.

PE funds comprehend General Partners (GPs), who manage the fund (PE firm) and receive a share of the profits (often 20%)<sup>14</sup>, and Limited Partners (LPs), that involve mainly "institutional investors and wealthy individuals" (Kaplan & Schoar, 2005, p. 1793), who provide most of the capital. LPs are not allowed to decide how the capital is employed and some examples of these partners include "corporate and public pension funds, endowments, insurance companies and wealthy individuals" (Kaplan & Strömberg, 2009, p. 123).

Since most PE funds have a limited contractual life (fixed life) and there is the need to exit the deal, there are some possible directions. According to Kaplan and Strömberg (2009, p. 129), the most common route is the sale of the firm to a strategic (nonfinancial) buyer, followed by the sale to another PE fund in a secondary buyout, while the issue of an initial public offering (IPO) route has been decreasing in relative importance as time goes by. In a more recent study, by analyzing 1022 European PE exits, Jenkinson and Sousa (2015, p. 399) found that the most important determinant of the exit route, when deciding between IPOs and secondary buyouts, is the capital market conditions, suggesting that PE funds take advantage of 'windows of opportunity'<sup>15</sup>.

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<sup>14</sup> U. Axelson, Strömberg, and Weisbach (2009, p. 1)

<sup>15</sup> "When stock markets have been rising strongly, the use of IPOs, relative to secondary sales, increases. When debt is abundant and cheap, and when private equity firms have a lot of committed capital to deploy, we observe an increase in secondary buyouts" (Jenkinson & Sousa, 2015, p. 407)

## **2.2. Private Equity Impact**

A valid following question regarding PE firms concerns their impact. Do PE firms actually enhance value overall? By analyzing the cash flow, return, and risk characteristics of PE, Ljungqvist and Richardson (2005, p. 28), documented that “private equity generates excess returns on the order of five to eight percent per annum relative to the aggregated public equity market” that was measured using the S&P 500 index, and S. Bernstein, Lerner, Sorensen, and Strömberg (2017, p. 1198) found that industries where PE funds invest grow faster in terms of total production and employment.

Nevertheless, some concerns must be taken into account relative to PE. Barger, Schlingemann, Stulz, and Zutter (2008, p. 390)’s analysis concluded that “target shareholders gain both statistically and economically if a public firm makes the acquisition” since the “target shareholders earn 63% higher premiums with public bidders rather than private equity bidders”. This difference in the price paid can suggest that the profits earned by certain PE firms may be a result of target shareholder’s expropriation. However, still in this study, it was discovered, that this difference in premiums disappears when the public bidders have high managerial ownership. This means that low managerial ownership is the key factor to find an increase in the premiums paid by public bidders, diluting the concern about expropriation by PE firms. On a similar note, Morkoetter and Wetzer (2016, p. 1; 16) found that, when controlling for firm and deal-specific characteristics, “PE funds pay 20% less, on average, than strategic buyers for comparable target corporations”. Nonetheless, it was found too that, when “PE funds benefit from synergies, they are willing to pay the same price level as strategic acquirers would do in comparable transactions”. In essence, this means that PE funds only pay less than strategic buyers when they cannot benefit from synergies.

## **2.3. How LBOs Work**

Concerning LBOs, overall, the reasoning behind this M&A vehicle, is the possibility of using a significant amount of borrowed money to finance the purchase price of the target firm, typically 60% to 90% debt (Kaplan & Strömberg, 2009, p. 124), and the remaining portion of the acquisition price is financed by the PE firm funds.

Employing high amounts of debt can bring some advantages to both the target and the acquirer firm. In Jensen (1986, p. 3)’s words, “debt reduces the agency costs of free cash flow” by shrinking the amount of cash flow accessible to the managers to use at their

preference since the “threat caused by failure to make debt payments serves as an effective motivating force to make such organizations more efficient”. Similarly, Guo, Hotchkiss, and Song (2011, p. 3) discovered that “improvements in cash flows, net of tax benefits, are greater for (...) firms with larger increases in debt” as a result of a buyout. However, as the level of leverage employed increases, so the “agency costs of debt rise, including bankruptcy costs” (Jensen, 1986, p. 4) and the difficulties in serving the debt, especially “if cash flow projections are not met and predicted sales are not completed” (Wilson, Wright, Siegel, & Scholes, 2012, p. 194; 195). In essence, until a certain point, having a great amount of debt brings advantages to the firm but, from that point on, some drawbacks are met.

Regarding the percentage of debt to be employed in LBOs, Colla, Ippolito, and Wagner (2012, p. 124) found a “positive relationship between pre-LBO profitability and deal leverage this is, the greater the level of pre-LBO profitability of the target firm, the greater the deal leverage. Kaplan and Strömberg (2009, p. 140) found a connection between leverage and interest rates and state that “leverage in leveraged buyouts decreases as interest rates rise”. Ulf Axelson, Jenkinson, Strömberg, and Weisbach (2013, p. 2264), using a worldwide sample of buyouts from the 1980 – 2008 period, established that what determines the amount of debt in buyouts are “the price and availability of debt”. These authors advocate that when credit is cheap and abundant, buyouts are more leveraged and noticed that there is a “negative relation between fund returns and leverage”. This means that, when the borrowing costs are low, the amount of leverage used increases and this lowers the buyout fund returns, leading to a decrease in the value creation of the buyout.

Firms that perform LBOs are described “as having a combination of unfavorable investment opportunities (low Tobin’s Q) and relatively high cash flows” and normally are more diversified than firms that do not perform LBOs (Opler & Titman, 1993, p. 1985). According to Jensen (1986, p. 6), desirable target firms for LBOs have “stable business histories and substantial cash flow (i.e., low growth prospects and high potential for generating cash flows)”. Ideally, the cash flows produced by the firm are sufficiently high to ensure the repayment of the debt service. In order to ensure the success of the LBO, according to DePamphilis (2017, p. 485), there are some important factors, among them, target selection<sup>16</sup>, not overpaying, and the capacity to improve the operating performance.

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<sup>16</sup> “good candidates for an LBO are those that have substantial unused borrowing capacity, tangible assets, predictable positive operating cash flow, and assets that are not critical to the continuing operation of the business.” (DePamphilis, 2017, p. 485)

Concerning this last topic, Long and Ravenscraft (1993, p. 23) found that, on average, LBOs improve operating performance by at least 15%.

## **2.4. Private Equity-Sponsored Buyout's impact**

In what concerns PE-sponsored buyouts, Wilson et al. (2012, p. 201), in order to assess the performance of U.K. PE-backed buyouts, discovered that during the 2008 – 2010 global recession, PE-backed buyouts experienced “higher growth, productivity, profitability, and improved working capital management, relative to comparable firms that did not experience such a transaction”. Guo et al. (2011, p. 2), using a sample of LBOs completed between 1990 and 2006, concluded that, for the LBOs with post-buyout data available, median market and risk-adjusted returns to post-buyout capital invested are positive and large (40.9%), meaning that these firms experienced great increases in value from the moment of the buyout until the exit of the PE firm. Potential explanations for these returns include the benefit “from rising market or industry valuation multiples while the firm is private”, the larger tax shields due to the increased leverage, and the possibility of value creation derived from “firm specific improvements in operating performance”<sup>17</sup>. According to Strömberg (2008, p. 6), even though PE-backed LBOs are more likely to experience a successful exit, they are also more prone to have their investments end up in financial distress. Amess and Wright (2012, p. 429) did not find evidence that LBO PE-backed (or LBOs in general) destroy jobs. However, these findings are not in tandem with a more recent study performed by Davis et al. (2019, p. 2; 8) that, by using a sample of PE-led LBOs, found that the employment in buyouts of publicly listed firms (public-to-private deals) fell by 13% over two years<sup>18</sup>. These authors also found evidence on average earnings per worker, discovering a decrease of 1.7% at target firms after buyouts. Ayash and Rastad (2020, p. 1) that, after tracking 484 LBOs, these transactions lead to an increase in the probability of the target bankruptcy by around 18%.

## **2.5. Club vs Non-Club Deals**

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<sup>17</sup> The authors, by using cross sectional regressions in order to provide evidence on the relative importance of the factors explaining the returns, concluded that “impact of changes in industry valuation multiples and realized tax benefits from increased leverage are each as important as operating gains in explaining returns” (Guo et al., 2011, p. 4)

<sup>18</sup> Nonetheless, the study also found a 13% increase in employment at target firms in buyouts of privately held firms.

It is possible to acquire equity portions in a target firm individually – Sole-Sponsored Deal – or by the pooling the assets of 2 or more PE firms – Club Deal.

In LBO club deals specifically, the study conducted by Officer et al. (2010, p. 215) emphasizes that the most prominent PE firms are the most likely to partner in clubs since smaller firms are “less likely to have the market power to meaningfully reduce competition and therefore prices”. According to the findings of J. X. Cao et al. (2015, p. 69), club deals are less common in cross-border LBOs.

## **2.6. Advantages of Club Deals**

Regarding the reasons why PE firms end up entering club deals, it is possible to point out some benefits.

- Clubbing allows PE firms to take smaller positions in each transaction, which allows them to diversify and, because of that, spread out the risk.

As noted in the study by Boone and Mulherin (2011, p. 1481), the motives behind the formation of club deals are directly related to scale, risk, and bidder expertise, meaning that “larger, riskier and more complex deals are more likely to be associated with a consortium vis-a-vis a single private equity firm”. Kim and Palia (2014, p. 11) found evidence that PE firms form a club, in order to diversify their risk and to some degree<sup>19</sup> acquire more profitable companies.

- Club deals have more flexibility associated with them, especially the possibility of purchasing more expensive and larger companies with this approach than by buying them alone.

According to the findings of J. X. Cao et al. (2015, p. 74) and Officer et al. (2010, p. 236), club deals transaction size is significantly larger than sole-sponsored LBOs deals, which means that capital constraints may be a motivation for club deals. However, the results of Officer et al. (2010) study provided only limited support for the perception that capital constraints are first-order motivations for club deals.

- Allows the participants to pool evidence resources and complementary capacities, reducing information costs, and leading to a “greater competition

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<sup>19</sup> 10% level of significance

and higher prices” (Boone & Mulherin, 2011, p. 1476) compared to the case where clubbing is not allowed.

Marquez and Singh (2013, p. 495) defend, as well, that information pooling increases the precision of the acquirer’s information.

- A final advantage is related to the positive effects of clubbing overall.

The study by Marquez and Singh (2013, p. 493) displays evidence that “social efficiency with club bidding is always higher” and it is also concluded that clubs are likely to have greater value for the target “as a result of the development of greater synergies (e.g., the joining of resources in the private equity or merged firms context) or through the superior pricing that may be obtained for the individual assets of the firm when sold individually in the secondary market”. Similarly, DeBrock and Smith (1983, p. 404)’s study acknowledges that, whether the participants are small or large firms, both the government and society can benefit significantly from the practice of joint bidding.

## **2.7. Disadvantages of Club Deals**

Despite these benefits, some concerns about clubbing have been noticed over time:

- Due to the existence of clubbing, the number of firms competing for a target firm will decrease significantly.

This is consistent with the findings in the study performed by Officer et al. (2010, p. 216) that discovered that there are “significantly fewer post-announcement competing bids in successful club deals than in successful sole-sponsored LBOs”.

- The decline in the number of bidders, brings some apprehensions, such as that PE partnerships may collude to decrease the level of competition and the price paid for a target firm.

This collusion hypothesis in auctions states that “whenever joint bidding occurs, potential rivals join together in a consortium that effectively precludes competition among its membership”(Smith, 1983, p. 355) and this problem actually caught the U.S. Department of Justice attention in 2006 and motivated, not only an inquiry but also “the filing of several

class actions suit by plaintiffs who argue that the bidding practices of private equity consortiums have harmed target shareholders” (Boone & Mulherin, 2011, p. 1493).

Cramton and Schwartz (2000, p. 26), when analyzing the Federal Communications Commission (FCC) spectrum auctions, concluded that “bidders that used (...) collusive bidding strategies paid significantly less” and J. X. Cao et al. (2015, p. 78) found evidence that club deals tend to include targets with lower multiples, which is consistent, in the author’s words, “with extant evidence that PE sponsors collude in club deals to avoid competition for attractive targets”. Nevertheless, Boone and Mulherin (2011, p. 1493) did not find evidence of collusion by PE consortiums and found evidence that was “inconsistent with the hypothesis that the joint bidding by private equity consortiums facilitates collusion in the corporate takeover market and to be consistent with the competition hypothesis<sup>20</sup> of joint bidding”. Additionally, Kim and Palia (2014, p. 10) study indicate that “private equity alliances do not generate significantly lower target returns because of collusion” and Guo et al. (2011, p. 4), by investigating the returns to PE investors in buyouts, found evidence that “(...) post-buyout returns are higher for club deals [than for sole-sponsored deals], and returns are not significantly related to measures of the competition in bidding”, bringing useful confirmations in the discussion over potential collusive bidding in club deals.

- Another drawback of club deals, still related to the decline in the number of competing bidders, is the risk of offering lower premiums to the target shareholders.

Regarding this downside there are mixed pieces of evidence available:

On the one hand, Officer et al. (2010, p. 214) claim that target shareholders receive lower premiums (around 40%) in club deals than in sole-sponsored LBOs. This author’s study is focused on PE-sponsored LBOs of U.S. publicly traded targets between 1984 and 2007 and is specific to acquisitions by prominent PE firms. According to this study, this discount is more pronounced in target firms with low institutional ownership. Similarly, in the study performed by X. Cao, Cumming, Goh, and Wang (2019, p. 3) with a sample of worldwide LBOs, when the authors used a difference-in-difference approach, that counted with non-LBO takeovers as the control groups, was found evidence that suggested that

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<sup>20</sup> “competition hypothesis (...) argues that consortiums can actually enhance competition” (Boone & Mulherin, 2011, p. 1476)

“target shareholders receive lower offering price in club LBOs than non-club LBOs”<sup>21</sup>. Likewise, Kim and Palia (2014, p. 19) investigation determined that “target abnormal returns earned by private equity firms in alliances are significantly lower when compared to their sole-sponsored private equity deals”. However, it is also stated that this lower abnormal return disappears when we control for the differences in target characteristics. In short, this means that PE club deals generate significantly lower target returns because of differences in target firm characteristics. Gygax et al. (2012, p. 22) study point out that, after controlling for firm and deal-specific characteristics, consortium deals are associated with significantly lower announcement returns than those for sole-sponsors deals. This evidence suggests that club deals have a detrimental effect on the wealth of target shareholders, based on announcement returns.

On the other hand, Boone and Mulherin (2011, p. 1477), by analyzing a sample of U.S. publicly traded targets in the 2003 – 2007 period, did not find any shreds of evidence that prominent PE firms or clubs of prominent PE firms have negative consequences on target returns or takeover competition and concluded that the prices paid by PE clubs are equivalent to the ones paid by other types of acquirers. This last study can be directly compared to the one done by Officer et al. (2010) since it includes data from both prominent PE firms and smaller PE firms. In short, these studies reach different conclusions in the same category of PE firms<sup>22</sup>. Similarly, J. X. Cao et al. (2015, p. 78)<sup>23</sup>, using a sample of global LBOs that includes transactions between 1995 and 2007, did not find evidence that club deals are related to significantly lower buyout pricing compared to sole-sponsored deals. Marquez and Singh (2013, p. 502) concluded that, if there is sufficient competition<sup>24</sup> from other sole-sponsored bidders, the creation of a club permits some of the value creation to

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<sup>21</sup> It is important to note that the authors did not find evidence of a different premium paid by club and non-club LBO deals when they used a sample of only LBOs

<sup>22</sup> “Our results differ in many respects from contemporaneous research by Officer et al. (2010) (...) We do not find evidence that prominent private equity firms or consortiums formed by prominent firms have negative effects on either takeover competition or target returns. Moreover, we do not find any negative effects on competition or target returns of prominent private equity firms or consortiums of prominent firms in the years prior to 2006. Finally, we do not find any interactive effect between private equity consortiums and institutional ownership” (Boone & Mulherin, 2011, p. 1477)

<sup>23</sup> Funny enough some authors of this study are the same as some authors in a previous study mentioned: X. Cao et al. (2019), such as, Xiaoming Wang. These studies reach different conclusions in what concerns the price paid by club and sole-sponsored LBOs deals. Even though both studies use samples from 1995 to 2007, the studies employ different assumptions, data and access different databases

<sup>24</sup> When we have a small number of bidders the formation of clubs is bad since we already do not have a very large competition leading to a “negative impact on the expected value of the winning offer”. However, as the number of bidders starts to increase, “the value creation effect associated with the club begins to dominate” (Marquez & Singh, 2013, p. 494)

be appropriated by the target, making not only the target better off but also the club's members. These authors specify that the club formation will only reduce the expected revenue received by the target shareholders if the bidding is costly since it will complicate the access of sole sponsors in the competition, leading to a reduction in the number of bidders. In essence, this means that, when the number of bids is held fixed and large, clubbing increases the high bid offer.

## **2.8. Summary**

To summarize, clubbing allows PE firms to diversify and purchase more expensive firms, due to the possibility of taking smaller positions in each transaction they participate in. At the same time, allows the sharing of expertise reducing, therefore, information costs, and increases social efficiency, leaving the government and society in better positions. Despite these advantages, with clubbing, there is a decline in the number of firms competing for the target firm which can lead to the collusion of the PE partnerships or a reduction in the premium offered to the target shareholders. Since this last point has created some big debates and mixed outcomes, the following study was conducted.

### 3. Sample Analysis

#### 3.1. Sample

The main objective of this dissertation is to compare the prices paid by clubs and sole-sponsored deals of PE firms. The sample of M&A to be used in this paper comes from the *Zephyr* database, more specifically from the PE advanced search of the *Zephyr*. This PE tab permits the user to find, in an easier way, PE-backed transactions and is dedicated to PE deals.

As a first step, all PE transactions that were denominated as “take private’s” in their deal type were extracted. This flag is expected to preserve only those deals in which a PE firm or consortium of PE firms acquires the stock of a publicly traded firm to transform the public target firm into a private firm. This forces the target to be public and, this condition resulted in 3720 cases.

As a following step, it was required the target firm country to be the United States of America (U.S.) and concerning the time, only completed deals that were announced between the period 01/01/2002 and 31/12/2018 were desired, which resulted in 676 cases<sup>25</sup>, which is the final sample.

#### 3.2. Aggregation of sample

From the 676 total cases, the next step was dividing between sole-sponsored PE and club deals of PE firms. It was noted that some acquisitions, involved acquisition vehicles therefore, in order to have a clearer sample, every single deal description was read to uncover the “real” acquirers. In each transaction, it was discriminated the name of the acquirer(s), according to the transaction description in the *Zephyr* database, and the name of the general partner(s) of the transaction. In case of doubt or in need of more information, the description of the acquisition/merger on the website of the bidding company in question and SEC reports was read.

In order to be able to calculate the stock returns, the target price of all these 676 “original” cases for the (-273, +20) interval was required, being the day 0 the deal announcement date. Only 415 targets had this information available, which reduced the sample.

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<sup>25</sup> This sample was downloaded in December of 2020 consequently, results may vary

### 3.3. Sample Breakdown

The definition considered for club deals included every case that had more than 1 PE firm as the acquirer and/or the cases that had more than one PE firm described as General Partner in the deal.<sup>26</sup> Some of these cases occur simultaneously. It was adopted a conservative approach, meaning that if it was not found clearly that a certain firm is a PE firm, but only a firm that performs PE investments, the firm was removed from the sample. In other words, only were considered the firms that had clear information on the website, Thomson Reuters/Refinitiv, Bloomberg, or any other trustworthy source. In case of doubt, the deal was removed from the sample.

It is important to mention that there are cases that in the description of the deal have “a consortium led by X” (being X a specific firm) and, in the cases where it was not possible to unveil the name of the other firms involved, either in news or in the firm’s website information, the cases were considered as a sole-sponsored deal. Regarding clubs, in the cases where mixed information regarding the type of firm of one of the firms that belonged to the club was found, it was chosen to adopt a conservative approach and not consider these firms as part of clubs of PE firms, but as part of sole-sponsored PE firm deals.

In total, the final sample has 76 club deals, which represents around 20% of the total cases of the sample.

Table 1 exhibits the distribution of the sample by year and by acquirer type.<sup>27</sup> There were considered 2 acquirers’ types: PE clubs and sole PE firms.

**Table 1: Sample distribution**

This table comprehends the distribution of the sample withdrawn from the Zephyr database. The transactions are categorized into years having into account the announcement date. There were selected the cases classified as “take private’s” in the deal type, the cases identified as announced in the period between 2002 and 2018 and that are completed, as well as, the cases where the target firm of the transaction belonged to the United States of America (U.S.). Sole-sponsored and club deals are determined having into account the number of PE acquirers and the number of GPs. If the transaction comprehends more than one PE firm as the acquirer or more than one GP, the case is classified as club deal. Deal Value is the sum of all deal values in each year and each category of acquirer described in the Zephyr database (m USD) and the Avg. Deal Value is the sum of all deal values in each year and each category of acquirer divided by the number of deals in each case.

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<sup>26</sup> This selection was made taken into account the business description provided by *Zephyr*

<sup>27</sup> See appendices 7, 8 and 9 to find a list of the most frequent PE firms as acquirers and a list of the target’s acquirers (club and sole-sponsored deals)

Announcement date	All deals			Deals					
	N° of deals	Avg. Deal Value	Deal Value	Club Deals			Sole-Sponsored		
				N° of deals	Avg. Deal Value	Deal Value	N° of deals	Avg. Deal Value	Deal Value
2002	1	824	824	0	0	0	1	824	824
2003	4	181	724	2	120	240	2	242	484
2004	9	1 376	12 381	3	2 767	8 301	6	680	4 080
2005	22	1 235	27 178	9	2 557	23 009	13	321	4 170
2006	35	4 777	167 209	16	9 582	153 310	19	732	13 899
2007	42	4 889	205 341	11	14 856	163 420	31	1 352	41 921
2008	12	2 657	31 885	2	13 200	26 400	10	549	5 485
2009	13	687	8 928	0	0	0	13	687	8 928
2010	30	1 345	40 347	6	3 864	23 181	24	715	17 166
2011	30	1 187	35 611	7	3 283	22 978	23	549	12 633
2012	24	899	21 587	6	1 833	11 000	18	588	10 587
2013	25	3 460	86 512	1	33 900	33 900	24	2 192	52 612
2014	18	2 277	40 992	1	11 185	11 185	17	1 753	29 807
2015	25	7 242	181 038	3	40 300	120 900	22	2 734	60 138
2016	29	1 893	54 893	2	9 222	18 444	27	1 350	36 449
2017	32	2 418	77 380	2	13 987	27 974	30	1 647	49 406
2018	21	2 450	51 440	5	6 260	31 300	16	1 259	20 140
<b>Total</b>	<b>372</b>		<b>1 044 270</b>	<b>76</b>		<b>674 522</b>	<b>296</b>		<b>369 748</b>

**Table 2: Simplification of Table 1**

Announcement date	All deals			Deals			
	N° of deals	Total Value	N° of deals	Club Deals		Sole-Sponsored	
				Total value	N° of deals	Total Value	
Non-Crisis	287	927 499	61	601 963	226	325 537	
Crisis	85	116 771	15	72 559	70	44 212	
<b>Total</b>	<b>372</b>	<b>1 044 270</b>	<b>76</b>	<b>674 522</b>	<b>296</b>	<b>369 748</b>	

By analyzing Table 1, it is possible to conclude that, while the number of deals reached the maximum in 2007, the number of club deals was the maximum in 2006 in this

sample. Although the number of sole-sponsored deals is always greater than the number of club deals, if not equal, this is not always true when talking about the total deal value. If the years where there are no club deals are ignored, in the pre-crisis period (2002 –2007), except for 2003, in this sample, the total deal value of club deals is always higher than in the sole-sponsored deals cases. The same holds for the crisis period. For the post crisis period (2012 – 2018) the conclusions vary, because the total deal value of club deals is higher than in the sole-sponsored deals cases in five years (2010 – 2012, 2015, 2018) and it is lower for four years (2013 – 2014, 2016 – 2017).

In the analysis period, if the years where club deals are not available are ignored, except for 2003, on average, the deal value was higher in the club deals. This is, in this sample and on average, clubs pay higher prices for targets when compared to cases where there is only one PE firm acquiring the target, with 2015 being the year with the highest price paid for a target.

## 4. Target Returns

### 4.1. Construction

In order to measure the gains to the target shareholders, the daily return data for each of the target firms were collected. To carry this objective, the daily returns of the target company in the *Zephyr* database and the Thomson Reuters platform were accessed.

From Finance Yahoo (Yahoo, n.d.) the Standard & Poor's (S&P) 500 historical data was gathered and, for each company, the close price (and calculated the returns) from 1 year before the -20 day prior to the announcement date until +20 day or delisting date, (-273, +20), whichever happened first, being day 0 the deal announcement date, was collected.

In the cases where the day of the announcement of the acquisition is not a trading day, it was assumed that the announcement day was the next trading day, and in the cases where the "1 year prior the day -20" is not a trading day, it was decided to use as the date for this day the correspondent prior trading day.

The next step was to calculate the Raw Returns, Cumulative Abnormal Returns (CAR), and Buy-and-Hold Abnormal Returns (BHARs), following the methodology of Officer et al. (2010). The first step involved looking for the closing prices of each firm in the sample and for the S&P 500 index price from 1 year before -20 until +20 or delisting date, (-273, +20), whichever occurred first. With these data the daily returns for each target were calculated and, with the returns from 1 year before -20 until -21, it was possible to calculate a market model, being the independent variable (Y) the target returns and the dependent variable (X) the S&P 500 returns (benchmark). By doing this, the alpha (return that does not depend on the market movements) and the beta (volatility of a security in relation to the market) of the model were found, which allowed calculating the predicted returns of the target by using the following formula:

$$\text{Predicted Returns}_i = \alpha_i + \beta_i * \text{S\&P 500 Returns}_i$$

Once these returns were available, the abnormal returns were calculated by making the difference between the predicted returns and the actual returns of the target. After these, the cumulative abnormal returns were found.

$$\text{Abnormal Return}_i = \text{Target Return}_i - \text{Target Market Model's Predicted Return}_i$$

$$CAR_i = \sum_{t=1}^T Abnormal\ Return_{i,t}$$

For the BHARs, these returns are calculated by subtracting the compound return of the S&P 500 from the abnormal returns of the target.

$$BHAR\ Return_i = Abnormal\ Return_i - S\&P\ 500\ Return_i$$

For the Raw Returns calculation, the following formula was applied:

$$Raw\ Returns_t = \frac{Price_t}{Price_{t-1}} - 1$$

Considering the deal announcement day as the day 0, the following intervals were considered for each target: day -20 to day -1 (identified as runup); day 0 to day +20 or delisting date, whichever occurs first (identified as markup) and day -20 to day +20 or delisting date, whichever occurs first (identified as premium). Additionally, the CAR of each target from trading day -1 to trading day +1 (identified as CAR) was also calculated, following some other papers (e.g., Officer et al. (2010), Barger et al. (2008)).

The choice of intervals takes into consideration Officer et al. (2010)'s choice however, it is slightly reduced. These authors considered longer run periods (whenever it is considered day 20 in this study, the authors considered day 126). This choice was made considering that after 20 days of the announcement date the returns are already stabilized and changes in the returns after that date are not related to the deal announcement<sup>28</sup>. This way it was ensured that the results obtained were related to the acquisition announcement and isolated from the external factors, removing these effects from the market prices.

## 4.2. Independent Variables

To study the possibility that the differences in gains to target shareholders between club and sole-sponsored deals may be due to differences in deal characteristics, a regression was estimated in which there are three return measures divided into eight intervals as dependent variables: Cumulative Abnormal Returns (CAR), Buy-and-Hold Abnormal Returns (BHARs) and Raw Returns. According to Officer et al. (2010, p. 225), runups are “inherently noisy”, and that is the reason why that period is not considered in the regression.

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<sup>28</sup> Boone and Mulherin (2011) opted for 3 intervals: (-1, +1); (-42, +126) and (-42, completion). Kim and Palia (2014) and J. X. Cao et al. (2015) only performed the study for the (-1, +1) interval

It is noteworthy that, in the study by Officer et al. (2010), the authors only consider three dependent variables: CAR (-1, 1), BHAR (0, 20), and BHAR (-20, 20). In this analysis, it was decided to extend the variables and consider eight.

The independent variables considered in the regression will include<sup>29</sup>:

- **Clubs**, which is a dummy variable that takes the value of 1 if the acquirer is a club of PE firms (2 or more PE firms), and zero otherwise;
- **Cash**, which is a dummy variable equal to 1 if the acquisition is totally paid in cash, and zero otherwise. Previous evidence from Datta, Pinches, and Narayanan (1992, p. 79) and Huang and Walkling (1987, p. 329) advances that abnormal returns linked with cash offers are significantly higher than with stock offers;
- **LBO**<sup>30</sup>, which is a dummy variable equal to 1 if the deal financing is a leveraged buyout, and zero otherwise. According to Ulf Axelson et al. (2013, p. 2264), there is a negative relationship between buyout fund returns and deal leverage, implying that it is expected a negative impact from this variable;
- **Toehold**, which is the percentage (%) held by the acquirer before the announcement date. Betton and Eckbo (2000, p. 27) found evidence that toeholds and offer premiums have a negative correlation since it reduces the probability of rival bidder entry and resistance from the target management team. It is expected to find a negative coefficient in this variable;
- **Target Location**, which is a dummy variable equal to 1 if the target is from a different country relative to the acquirer (cross-border deal) and is 0 if both acquirer and target are from the U.S.. Harris and Ravenscraft (1991, p. 842) illustrate that the wealth gains for the target are significantly higher in cross-border acquisitions than in domestic ones;
- **Sector**, which is a dummy variable equal to 1 if the acquirer and the target are present in a different major sector, and zero otherwise. According to the study

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<sup>29</sup> See appendix 10 to find the N° of Occurrences of Each Dummy

<sup>30</sup> There is no information regarding how this variable is defined and most of the targets do not have available the debt value employed in the transaction, making it impossible to manually calculate it. For this study it will have to be assumed that it is correct and well stated, which is a limitation of the work

performed by Datta et al. (1992, p. 79), targets maximize their gains by being acquired by a bidding firm in a related industry;

- **Target EBITDA/Assets**, which is calculated by dividing the last available year of the pre-deal target EBITDA (m USD) by the last available year of the pre-deal target assets (m USD). It was decided to consider the EBITDA because, following Officer et al. (2010, p. 224), it is the most frequently used measure of cash flow in the PE literature. By K. Cao, Coy, and Nguyen (2016, p. 645) this ratio should be positively related to the premiums offered by the acquirers since the targets with high cash flows have an “increased potential for gains from going private”;
- **Log (Deal Value)**, which is the logarithm of the price paid for the target by the acquirer (m USD). This variable was employed in this study based on J. X. Cao et al. (2015) that also employed this logarithm. This ratio is expected to harm a target’s returns since, when the target is a large firm, in comparison with smaller firms, there is less potential of improvement in the firm, more complexity in implementing alterations as well as acquiring the firm, implying a lower premium;
- **Crisis**, which is a dummy equal to 1 if the acquisition was announced in the crisis period (2008 – 2011), and zero otherwise. It is expected that this variable has a positive impact on the dependent variable since, in crisis periods, the prices are lower, which allows a better premium to be paid by the acquirer.<sup>31</sup>

Some other ratios, such as DEBT/Assets and Market to Book ratio, were considered important to add to the regression however because these variables were available for a reduced number of targets, it was considered prudent to not insert these variables, in order to not reduce, even more, the observations. This is considered one of the main limitations of this work.

### 4.3. Regression

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<sup>31</sup> See appendices 11 and 12 to find the descriptive statistics of some important variables

To understand the impact of each independent variable in the premiums, a regression is required.

A negative coefficient for  $\beta_1$  would indicate that the premium paid by clubs is lower when compared with the premiums paid by sole-sponsored deals in the period of analysis.

The following regression was considered:

$$Premium_i = \beta_0 + \beta_1 * Clubs + \beta_2 * Cash + \beta_3 * Toehold + \beta_4 * Target\ location + \beta_5 * Sector + \beta_6 * \frac{EBITDA}{Assets} + \beta_7 * Log(Deal\ Value) + \beta_8 * Crisis + \beta_9 * (Crisis * Clubs) + \epsilon_i$$

**Table 3: Multivariate regressions explaining target returns**

This table has the results of regressions of Raw Returns, BHAR and CAR, and expressed in percentage. Clubs is an indicator variable for the deal categories and is equal to 1 if the acquirer is a club of PE firms, and zero otherwise. Cash is an indicator variable equal to 1 if the takeover is 100% cash, and zero otherwise. Toehold is the percentage held by the acquirer before the announcement date. Target Location is an indicator variable equal to 1 if the target is from a different country relative to the acquirer (cross-border acquisition), and zero otherwise. Sector is an indicator variable equal to 1 if the target and the acquirer operate in different major sectors, and zero otherwise. EBITDA/Assets is a ratio calculated by dividing the last available year of the pre-deal target EBITDA (m USD) by the last available year of the pre-deal target assets (m USD). Log (Deal Value) is the logarithm of the price paid for the target by the acquirer (m USD). Crisis is a dummy equal to 1 if the acquisition was announced in the crisis period (2008 – 2011), and zero otherwise. Crisis\*Clubs is the interaction between the dummy Crisis and the dummy Clubs. Industry control dummies included. Heteroskedasticity consistent standard errors and covariance. \*\*\*, \*\*, \* indicates that the coefficient estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

**Target's returns – All Sample**

	RAW			BHAR		CAR		
	(-1,1)	(0,20)	(-20,20)	(0,20)	(-20,20)	(-1,1)	(0,20)	(-20,20)
<b>Clubs</b>	-0.028	-0.026	-0.034	-0.031	-0.025	-0.027	-0.030	-0.032
<b>Cash</b>	-0.075*	-0.075*	-0.089**	-0.085*	-0.096*	-0.078*	-0.081*	-0.093**
<b>Toehold</b>	0.268	0.395	0.180	0.351	0.317	0.288	0.396	0.311
<b>Target Location</b>	-0.008	-0.019	-0.009	-0.015	0.011	-0.008	-0.015	0.005
<b>Sector</b>	0.039	0.044	0.016	0.036	0.026	0.037	0.043	0.025
<b>EBITDA/Assets</b>	-0.059**	-0.057**	-0.062***	-0.037	-0.054	-0.061**	-0.050*	-0.064**
<b>Log (Deal Value)</b>	-0.04***	-0.045***	-0.035***	-0.045***	-0.036**	-0.041***	-0.044***	-0.035**
<b>Crisis</b>	0.063	0.077	0.105*	0.099	0.112	0.063	0.086	0.107*
<b>Crisis*Clubs</b>	-0.036	-0.041	-0.061	-0.063	-0.066	-0.037	-0.056	-0.070
<b>Constant</b>	0.354***	0.447***	0.442***	0.388*	0.297**	0.370***	0.398**	0.320**

<b>Observations</b>	372	372	372	372	372	372	372	372
<b>R-Squared</b>	0.10	0.11	0.12	0.10	0.09	0.10	0.10	0.10

From the regression performed some conclusions can be withdrawn:

- When all transactions are considered without separating between prominent and non-prominent PE firms, the variable Clubs is never statistically significant, which means that there is no difference in the premiums paid for the target by clubs of PE firm deals when compared to sole-sponsored PE firm deals. This result is in tandem with the findings of Boone and Mulherin (2011).
- Cash is significantly negative in all intervals of all categories of returns meaning that, when the payment is made through 100% cash, the premiums are lower than when it is used a different method of payment.
- EBITDA/Assets ratio is statistically significant in all the intervals of the RAW and CAR returns. Since this variable is significantly negative this means that the higher this ratio, the lower the premiums paid by the acquirer. This conclusion is understandable because, when a business is rentable, it is expectable to need fewer improvements than when it is not, involving a lower premium;
- The logarithm of Deal Value is statistically significant in all intervals. As the coefficients of this variable are negative, this means that the target's premiums are negatively affected by this variable. This is reasonable because in bigger firms, *ceteris paribus*, it is expected higher efficiency and, subsequently, there are fewer reasons for alterations, leading to a lower premium;
- The Crisis dummy is significantly positive in the (-20, 20) interval of the RAW and the CAR returns, which means that premiums paid are higher in a financial crisis period in relation to the premiums paid in a non-financial crisis period in this interval. This conclusion is comprehensible since, in crisis periods, the prices are lower, enabling the acquirer to pay a better premium;

- Crisis\*Clubs is never statistically significant, implying that the premiums paid by clubs of PE firms are not statistically different from the premiums paid by sole-sponsored PE firms in the crisis periods.

To conclude, from this regression it is possible to conclude that there is no difference in the premiums paid between sole and clubs of PE firms when the sample incorporates all categories of PE firms without the separation between prominent and small PE firms. This conclusion is in complete agreement with the study performed by Boone and Mulherin (2011) that used a similar sample that incorporated both prominent and small PE firms.

Premiums paid in financial crisis periods are higher than in non-financial crisis periods in the (-20,20) interval of the RAW and the CAR returns and the premiums paid by clubs of PE firms are not statistically different from the premiums paid by sole-sponsored PE firms in the crisis periods.<sup>32</sup>

#### **4.4. Robustness Analysis: Potential Impact of Prominent PE Firms**

In addition to all the independent variables indicated above, another characteristic was considered important to be tested. This involves the definition of prominent PE firms. In light of the study by Officer et al. (2010), the sample was separated into prominent and non-prominent PE firms by taking into account the names of the 50 largest PE firms in the world as reported in the *Private Equity International* (PEI) magazine. This ranking is based on capital raised over the 5 years between 2015 – 2020. Similar to the authors the names of Merrill Lynch, Morgan Stanley, and JP Morgan were added to the list. If the acquirer/GP contained the name of at least one prominent PE firm and at least one other PE firm, prominent or not, is identified as the acquirer, then the deal was classified as a Club deal. If the deal only included the name of one prominent PE firm and no other firm is identified as the acquirer, then the deal was classified as a Sole PE deal<sup>33</sup>. As the sample does not include only prominent PE firms, the cases where none of the acquirers is a prominent PE firm in

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<sup>32</sup> Just as a test, the variables Debt/Assets, which is the target's pre-deal debt (m USD) divided by the last available year of the pre-deal target assets (m USD), and Market-to-Book ratio, calculated by dividing the last available year pre-deal target's market capitalization (m USD) by the target's equity (m USD) were added to the regression, and the results were comparable. By performing this regression, the total sample incorporates only 253 deals, with 36 defined as clubs

<sup>33</sup> See appendix 13 for a list of the Prominent PE firms that are described as acquirers in the sample

the cases of club deals and the acquirer is not a prominent PE firm in the case of the sole-sponsored deals case were eliminated, remaining 198 deals from the original sample.

When performing the same regression mentioned above, but exchanging the variable “Club” for the variable “Club Prominent”, keeping all other variables as control, different results were found<sup>34</sup>:

- The Club Prominent dummy is significantly negative in all intervals of the returns. This means that, for these intervals, the premiums paid by clubs of prominent PE firms are lower than the premiums paid by sole prominent PE firms.

Taking the coefficient from the interval (-1, 1) of the RAW as an example, this means, in economic terms, that the premium paid for a target decreases around 7.7 percentage points when the acquisition is performed by a club of prominent PE firms in comparison with an acquisition by sole prominent PE firms. This reduction varies between 6.6 and 7.8 percentage points.

This result can be explained by the fact that since prominent firms are defined as the largest PE firms based on capital raised, these firms have a bigger capacity to negotiate, a better reputation in terms of effective deals, and a higher probability of performing a successful and less complex transaction than non-prominent firms which allows them to pay lower premiums.

This finding is not in agreement with the results of Boone and Mulherin (2011) since the authors did not find a significant difference in the returns in their study when this separation was created.

- In what concerns the dummy Crisis and the variable Crisis\*Club Prominent, none of these variables is statistically significant, which implies that the premiums paid by prominent PE firms in financial and non-financial periods are not statistically different and the premiums paid by clubs of prominent PE firms are not statistically different from the premiums paid by sole prominent PE firms in the crisis periods.

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<sup>34</sup> See appendix 14 for more details regarding the prominent club’s regression

To sum up, when a separation between prominent and non-prominent PE is implemented, clubs of prominent PE firms pay lower premiums in all intervals of returns compared to acquisitions by sole prominent PE firms.

#### **4.5. Robustness Analysis: Impact of Prominent PE Firm's LBOs**

As a final test, to have a study comparable with the one by Officer et al. (2010), a regression to understand the impact of prominent PE firm's LBOs in the premiums paid by club and sole-sponsored deals was performed.

To achieve this objective, the same regression as before was employed however, instead of the variable "Clubs" was considered the variable "Clubs Prominent" and the interaction between LBO and Clubs ("LBO\*Clubs Prominent") was added, maintain all the other variables as control.

From this regression some conclusions are reached:

- The Club Prominent dummy is significantly negative in all intervals of returns. The conclusion is the same mention above in section 4.4.;
- The interaction LBO\*Clubs Prominent is not statistically significant. This result implies that, for these intervals, the premiums paid by clubs of prominent PE firms are not statistically different from the premiums paid by sole prominent PE firms when the acquisition was made through high employment of debt. This finding is not in tandem with the results found by Officer et al. (2010) since, following the authors, clubs of prominent PE firms paid lower premiums than sole prominent PE firms when the acquisition was made through a LBO.

Concluding, when a separation between prominent and non-prominent PE is implemented and only LBO transactions are considered, clubs of prominent PE firms paid lower premiums in all intervals of returns in relation to acquisitions by sole prominent PE firms.

## 5. Conclusion

The purpose of this dissertation is to understand the differences in the premiums paid for publicly traded firms when the acquirer is one PE firm (sole-sponsored deal) and when the acquirer consists of several PE firms (club deal) with the study focused on the U.S. market and the crisis vs non-crisis periods.

This work comprises a sample of 372 PE deals, where 76 are classified as club deals and 296 are sole-sponsored deals, from the period between 2002 and 2018.

After the elaboration of this dissertation, it is possible to answer all three big research questions that were proposed:

- **H1:** Premiums paid by clubs of PE firms are higher than the ones paid by sole-sponsored PE firms in the considered period (2002 – 2018).

From the sample employed in this study, it is possible to conclude that, when all transactions are considered without separating between prominent and non-prominent PE firms, the premiums paid by clubs of PE firms are not significantly different from the ones paid by sole-sponsored PE firms. This result is in accordance with the findings of Boone and Mulherin (2011).

When the sample is separated between prominent and non-prominent PE firms, the premiums paid by clubs of prominent PE firms are lower than the premiums paid by sole prominent PE firms in all intervals of returns. Since the only variable that changed, between these two cases, was the dummy clubs and the dummy clubs prominent, the differences in premiums in the results have a relation with the type of PE that acquires the target. Since prominent firms are defined as the largest PE firms based on capital raised, when in a club, prominent PEs have the market power to significantly reduce competition and, consequently, the price, paying lower premiums than sole prominent PE firms.

To have a comparative study with Officer et al. (2010) it was, additionally, considered a sample that involved the separation between prominent and non-prominent PE firms where only LBOs were considered. The conclusion was that premiums paid by clubs of prominent PE firms were not significantly different from the premiums paid by sole prominent PE firms. This result is not in tandem with the results found by Officer et al. (2010) that found a discount in these transactions.

In summary, this work reinforces the conclusions of Boone and Mulherin (2011) when all sample is considered and did not reach the same conclusions of Officer et al. (2010) about prominent PE firm's LBOs. Nevertheless, this analysis does not coincide with the findings of Boone and Mulherin (2011) when the authors only consider prominent PE firms.

- **H2:** Premiums paid by clubs of PE firms are higher than the ones paid by sole-sponsored PE firms in the financial crisis period (2008 – 2011).

When all transactions are considered without separating between prominent and non-prominent PE firms, premiums paid in financial crisis periods are higher than in non-financial crisis periods in the (-20,20) interval of the RAW and the CAR returns but are not statistically different when the separation is considered.

From the regressions performed it is possible, as well, to conclude that the premiums paid by clubs of PE firms are not statistically different from the premiums paid by sole PE firms in a financial crisis period in both analyses (i.e., when there is and when there is not a separation between prominent and non-prominent PE firms).

- **H3:** On average, the deal value in club deals is higher than in sole-sponsored deals.

In the sample of this study, if the years where club deals are not available are ignored, except for 2003, on average, the deal value was higher in the club deals. This is, in this sample and on average, clubs pay higher prices for targets when compared to cases where there is only one PE firm acquiring the target, with 2015 being the year with the highest price paid for a target.

A limitation of this work relies on the fact that not all companies in the original sample had their daily price information public, which made it impossible to count on their information. Due to this, some relevant targets and cases had to be eliminated, which decreased the number of deals in the sample. This study would have gained if the market capitalization values of the acquirers were available, to calculate the relative size, as well as the level of pre-deal debt, pre-deal equity, and market capitalization of every single target. This limitation forbade the calculation of some relevant ratios. Since the debt level of most of the targets was not available, it was required to rely on *Zephyr* and assume that the variable LBO is well defined.

An interesting extension would be to develop the same model in data from before, during, and after the COVID-19 pandemic crisis and understand if the same results are found. This study will only be possible to execute in a few years but has potential.

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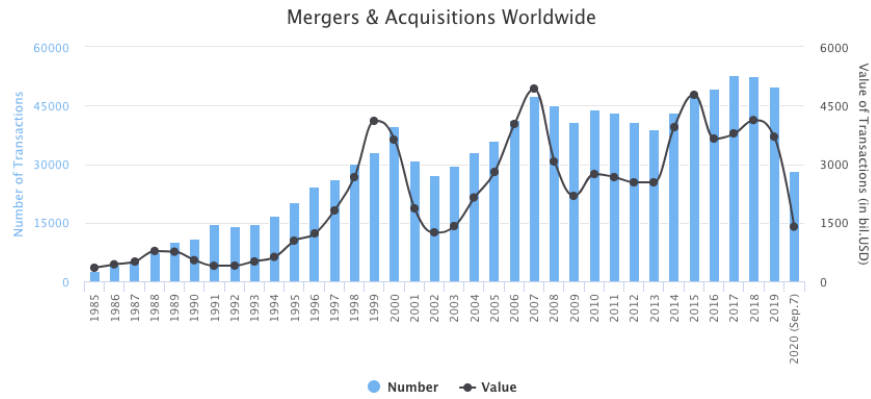
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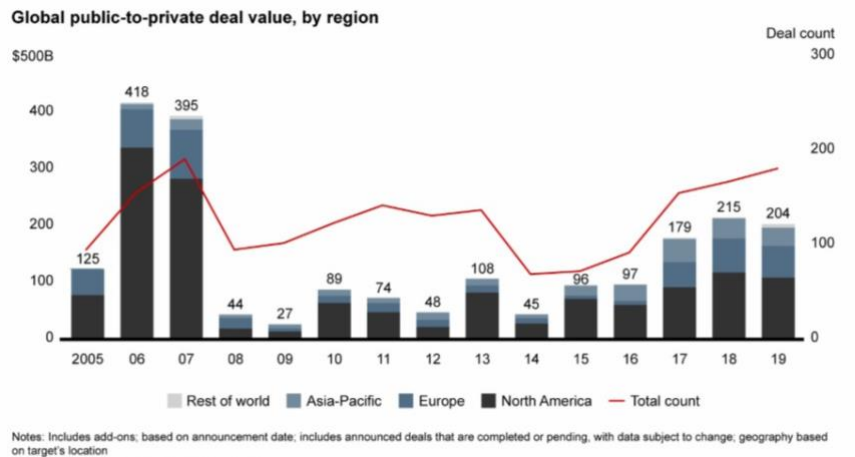
# Appendices

## Appendix 1: M&A Activity Worldwide (1995 – September 2020)



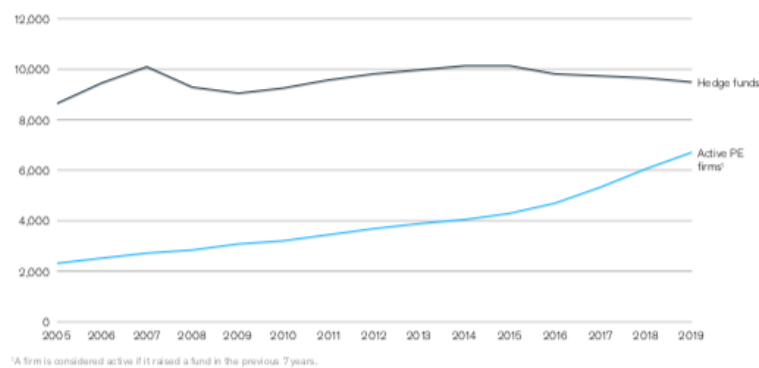
Source: IMAA Analysis; September 2020

## Appendix 2: Global Public-to-Private Deal Value (in \$billion) and Deal Count (2005 – 2019)



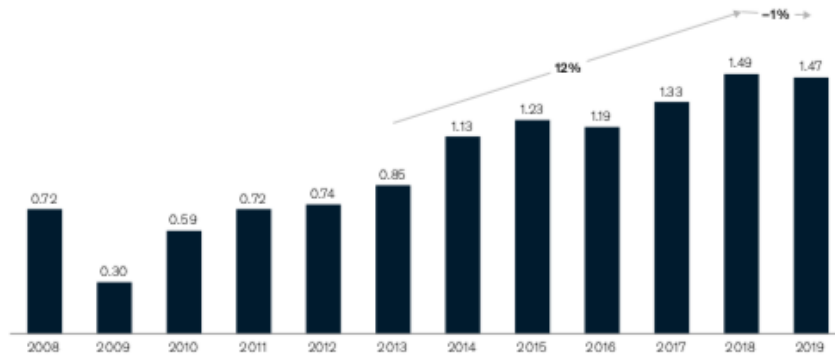
Source: Bain Global Public-to-Private Deal Database; 2020

## Appendix 3: Number of PE Firms and Hedge Funds (2005 – 2019)



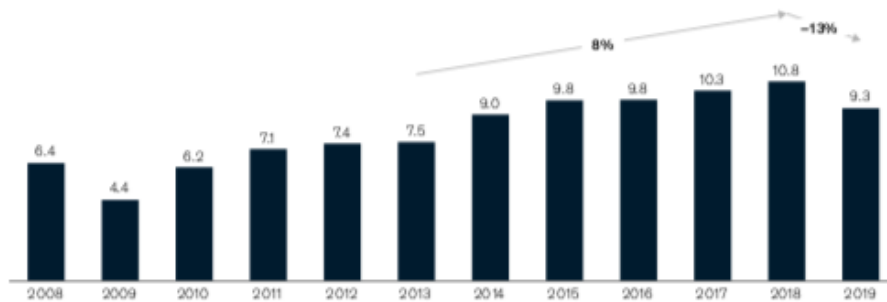
Source: McKinsey Global Private Markets Review; 2020

#### Appendix 4: Global PE Deal Volume (2013 – 2018), in \$trillion



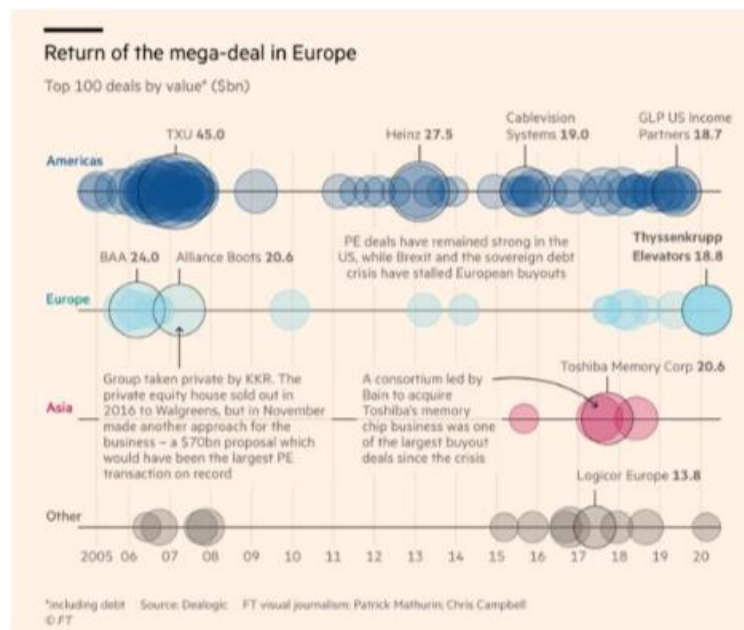
Source: McKinsey Global Private Markets Review; 2020

#### Appendix 5: Global PE Global Deal Count (2013 – 2018), in thousands



Source: McKinsey Global Private Markets Review; 2020

#### Appendix 6: Return of the Mega-Deal in Europe



Source: Financial Times; March 2020

## Appendix 7: Most Frequent PE Firms as Acquirers

Rank	50 Prominent PE Firm	PE Firm Name	N° of Deals
1	Yes	Apollo Global Management	20
1	Yes	TPG	20
3	Yes	Blackstone	18
4	Yes	Carlyle Group	14
4	Yes	Vista Equity Partners	14
6	No	Golden Gate Private Equity Inc	13
6	Yes	Thoma Bravo	13
8	Yes	KKR	12
9	Yes	Bain Capital	11
10	No	Hellman & Friedman	9

## Appendix 8: Targets of Club Deals

Year	Target Name	PE Acquirers	Year	Target Name	PE Acquirers
2003	Garden Fresh Restaurant Corporation	Fairmont Capital Inc.; Centre Partners Management	2007	Kronos Inc.	Hellman & Friedman; JMI Equity
2003	Concerto Software Inc.	Golden Gate Private Equity Inc.; Oak Investment Partners	2007	Vertrue Inc.	Oak Investment Partners; One Equity Partners
2004	Metro-Goldwyn-Mayer Inc.	TPG; DLJ Merchant Banking Partners; etc.	2007	Compudyne Corporation	Gores Group, The; Clearlake Capital Group
2004	Select Medical Corporation	Welsh Carson Anderson & Stowe; Thoma Cressey Equity Partners	2008	Clear Channel Communications Inc.	Thomas H Lee Partners; Bain Capital
2004	Medsource Technologies Inc.	KRG Capital; DLJ Merchant Banking Partners	2008	Restoration Hardware Inc.	L Catterton; Tower Three Partners
2005	Toys R Us Inc.	KKR; Bain Capital	2010	Del Monte Foods Company	KKR; Vestar Capital Partners; etc.
2005	Neiman Marcus Group Inc.	TPG; Warburg Pincus; etc.	2010	Interactive Data Corporation	Warburg Pincus; Silver Lake Partners

2005	Linens'N Things Inc.	Apollo Global Management; Tri-Artisan Capital Partners	2010	J Crew Group Inc.	TPG; Leonard Green & Partners
2005	Doubleclick Inc.	Hellman & Friedman; JMI Equity	2010	Sonicwall Inc.	Thoma Bravo; Teachers' Private Capital
2005	Aspect Communications Corporation	Oak Investment Partners; Golden Gate Private Equity Inc.	2010	Internet Brands Inc.	Hellman & Friedman; JMI Equity
2005	Insurance Auto Auctions Inc.	Kelso & Company; PCP Managers	2010	Alloy Inc.	Rosemont Investment Partners LLC; Natixis Private Equity AS
2005	Party City Corporation	Berkshire Partners; Weston Presidio	2011	Pharmaceutical Product Development Inc.	Carlyle Group; Hellman & Friedman
2005	Mapics Inc.	Golden Gate Private Equity Inc.; Summit Partners	2011	Emdeon Inc.	Blackstone; AlpInvest Partners BV
2005	Brooktrout Inc.	Oak Investment Partners; TowerBrook Capital Partners	2011	BJ's Wholesale Club Inc.	Leonard Green & Partners; CVC Capital Partners
2006	HCA Inc.	KKR; Merrill Lynch Global Private Equity Inc.	2011	Blue Coat Systems Inc.	Thoma Bravo; Teachers' Private Capital
2006	Kinder Morgan Inc. (OLD)	Carlyle Group; Riverstone Holdings; etc.	2011	Tekelec Inc.	Siris Capital Group; ZelnickMedia Corporation; etc.
2006	Freescale Semiconductor Inc.	Blackstone; Carlyle Group; etc.	2011	Gerber Scientific Inc.	Vector Capital Management LP; Citic Capital
2006	Univision Communications Inc.	Madison Dearborn Partners; TPG; etc.	2011	Rae Systems Inc.	Vector Capital Management LP; Citic Capital
2006	Aramark Corporation	Warburg Pincus; Thomas H Lee Partners; etc.	2012	Abovenet Inc.	Charlesbank Capital Partners; GTCR
2006	Michaels Stores Inc.	Bain Capital; Blackstone	2012	Collective Brands Inc.	Blum Capital; Golden Gate Private Equity Inc.

2006	Sabre Holdings Corporation	Silver Lake Partners; TPG	2012	Ancestry.com Inc.	Permira Advisers; AlpInvest Partners BV; etc.
2006	West Corporation	Quadrangle Group; Thomas H Lee Partners	2012	Interline Brands Inc.	GS Capital Partners; P2 Capital Partners
2006	Adesa Inc.	PCP Managers; Kelso & Company; etc.	2012	TPC Group Inc.	First Reserve Corporation; SK Capital Partners
2006	Reynolds & Reynolds Company, The	Vista Equity Partners; Goldman Sachs Capital Partners	2012	Duff & Phes Corporation	Carlyle Group; Stone Point Capital
2006	Petco Animal Supplies Inc.	TPG; Leonard Green & Partners	2013	BMC Software Inc.	Golden Gate Private Equity Inc.; Bain Capital; etc.
2006	Intergraph Corporation	Hellman & Friedman; TPG; etc.	2014	Riverbed Technology Inc.	Thoma Bravo; Teachers' Private Capital
2006	Ryan's Restaurant Group Inc.	Fortress Investment Group; Caxton-Iseman Capit	2015	Solarwinds Inc.	Thoma Bravo; Silver Lake Partners
2006	Watchguard Technologies Inc.	Francisco Partners Management; Vector Capital Management LP	2015	Life Time Fitness Inc.	Leonard Green & Partners; TPG; etc.
2006	Netsmart Technologies Inc.	Insight Partners; Salmon River Capital	2015	Blount International Inc.	American Securities; P2 Capital Partners
2006	Macdermid Inc.	Court Square Capital Partners; Weston Presidio	2016	Apollo Education Group Inc.	Apollo Global Management; Vistria Group; etc.
2007	TXU Corporation	TPG; KKR; etc.	2016	EPIQ Systems Inc.	OMERS Private Equity Inc.; Harvest Partners
2007	Biomet Inc.	Blackstone; KKR; etc.	2017	Kindred Healthcare Inc.	Welsh Carson Anderson & Stowe; TPG
2007	Nuveen Investments Inc.	Madison Dearborn Partners; Merrill Lynch	2017	Albany Molecular Research Inc.	GTCR; Carlyle Group

		Global Private Equity Inc.; etc.			
2007	Servicemaster Company	Clayton Dubilier & Rice Inc.; Banc of America Capital Investors	2018	Dun & Bradstreet Corporation	CC Capital Management; Thomas H Lee Partners
2007	Ceridian Corporation	Thomas H Lee Partners; Banc of America Capital Investors	2018	Blackhawk Network Holdings Inc.	P2 Capital Partners; Silver Lake Partners
2007	Laureate Education Inc.	KKR; Sterling Fund Management; etc.	2018	Civitas Solutions Inc.	Centerbridge Partners; Vistria Group
2007	OSI Restaurant Partners Inc.	L Catterton; Bain Capital	2018	Commerchub Inc.	GTCR; Sycamore Partners
2007	Genesis Healthcare Corporation	JER Partners; Formation Capital	2018	Bojangles' Inc.	Jordan Company, The; Durational Capital

### Appendix 9: Targets of Sole-Sponsored Deals

Year	Target Name	PE Acquirer	Year	Target Name	PE Acquirer
2002	Ameripath Inc.	Welsh Carson Anderson & Stowe	2012	Peet'S Coffee & Tea Inc.	BDT Capital Partners LLC
2003	Insignia Financial Group Inc.	Blum Capital	2012	Great Wolf Resorts Inc.	Apollo Global Management
2003	Gundle/Slr Environmental Inc.	CHS Capital	2012	Eresearch Technology Inc.	Genstar Capital
2004	Boca Resorts Inc	Blackstone	2012	Talbots Inc., The	Sycamore Partners
2004	Sola International Inc.	EQT Partners	2012	Caribou Coffee Company Inc.	BDT Capital Partners LLC
2004	Us Oncology Inc.	Welsh Carson Anderson & Stowe	2012	Young Innovations Inc.	Linden Capital Partners
2004	Prime Hospitality Corporation	Blackstone	2012	Dreams Inc.	Insight Partners
2004	Del Laboratories Inc.	Kelso & Company	2012	Edelman Financial Group Inc., The	Lee Equity Partners

2004	Compucom Systems Inc.	Platinum Equity	2012	China Transinfo Technology Corporation	SAIF Advisors Ltd
2005	La Quinta Corporation	Blackstone	2012	Comverge Inc.	HIG Capital
2005	Insight Communications Company Inc.	Carlyle Group	2012	Heelys Inc.	Tengram Capital Partners
2005	Shopko Stores Inc.	Sun Capital Partners Inc.	2012	TNS Inc.	Siris Capital Group
2005	Serena Software Inc.	Silver Lake Partners	2013	Dell Inc.	Silver Lake Partners
2005	Metals Usa Inc.	Apollo Global Management	2013	Hj Heinz Company	3G Capital
2005	Brookstone Inc.	JW Childs Associates	2013	Gardner Denver Inc.	KKR
2005	Penn Engineering & Manufacturing Corporation	Tinicum Capital Partners	2013	Lender Processing Services Inc.	Thomas H Lee Partners
2005	Pegasus Solutions Inc.	Prides Capital Partners LLC	2013	Jones Group Inc., The	Sycamore Partners
2005	Worldwide Restaurant Concepts Inc.	Pacific Equity Partners	2013	National Financial Partners Corporation	Madison Dearborn Partners
2005	Enterasys Networks Inc.	Gores Group, The	2013	Rue21 Inc.	Apax Partners
2005	Goody's Family Clothing Inc.	GMM Capital	2013	Active Network Inc., The	Vista Equity Partners
2005	Register.Com Inc.	Vector Capital Management LP	2013	Websense Inc.	Vista Equity Partners
2005	Blue Martini Software Inc.	Golden Gate Private Equity Inc.	2013	Tellabs Inc.	Marlin Equity Partners
2006	Albertson'S Inc.	Cerberus Capital Management	2013	Asiainfo-Linkage Inc.	Citic Capital
2006	Carramerica Realty Corporation	Blackstone	2013	True Religion Apparel Inc.	TowerBrook Capital Partners
2006	Trizec Properties Inc.	Blackstone	2013	Greenway Medical Technologies Inc.	Vista Equity Partners
2006	Aleris International Inc.	TPG	2013	Hot Topic Inc.	Sycamore Partners
2006	Meristar Hospitality Corporation	Carlyle Group	2013	Keynote Systems Inc.	Thoma Bravo

2006	Burlington Coat Factory Warehouse Corporation	Bain Capital	2013	Arden Group Inc.	TPG
2006	Yankee Candle Company Inc., The	Madison Dearborn Partners	2013	Anaren Inc.	Veritas Capital
2006	Jacuzzi Brands Inc.	Apollo Global Management	2013	Energysolutions Inc.	Energy Capital Partners
2006	Encore Medical Corporation	Blackstone	2013	Globecomm Systems Inc.	Wasserstein & Co.
2006	Thomas Nelson Inc.	InterMedia Partners	2013	Assisted Living Concepts Inc.	TPG
2006	Ace Cash Express Inc.	JLL Partners	2013	Telular Corporation	Avista Capital Partners
2006	Metrologic Instruments Inc.	Francisco Partners Management	2013	Flow International Corporation	AIP
2006	Jameson Inns Inc.	JER Partners	2013	Feihe International Inc.	Morgan Stanley Private Equity Asia III Inc.
2006	Indus International Inc.	Vista Equity Partners	2013	Edac Technologies Corporation	Greenbriar Equity Group
2006	Manugistics Group Inc.	Thoma Cressey Equity Partners	2013	Memsic Inc.	IDG Capital Partners
2006	Checkers Drive-In Restaurants Inc.	Wellspring Capital Management	2014	Safeway Inc.	Cerberus Capital Management
2006	Reader's Digest Association Inc., The	Ripplewood Holdings	2014	Tibco Software Inc.	Vista Equity Partners
2006	Onyx Software Corporation	Thoma Cressey Equity Partners	2014	Compuware Corporation	Thoma Bravo
2006	Zomax Inc.	Comvest Partners	2014	Dfc Global Corporation	Lone Star Funds
2007	Equity Office Properties Trust	Blackstone	2014	Cec Entertainment Inc.	Apollo Global Management
2007	First Data Corporation	KKR	2014	Digital River Inc.	Siris Capital Group
2007	Dollar General Corporation	KKR	2014	Chindex International Inc.	TPG
2007	Hcr Manor Care Inc.	Carlyle Group	2014	Vocus Inc.	GTCR
2007	Bausch & Lomb Inc.	Warburg Pincus	2014	Pike Corporation	Court Square Capital Partners
2007	Florida East Coast Industries Inc.	Fortress Investment Group	2014	American Pacific Corporation	HIG Capital

2007	Claire's Stores Inc.	Apollo Global Management	2014	Einstein Noah Restaurant Group Inc.	BDT Capital Partners LLC
2007	Goodman Global Inc.	Hellman & Friedman	2014	Rg Barry Corporation	Mill Road Capital
2007	Sequa Corporation	Carlyle Group	2014	Microfinancial Inc.	Fortress Investment Group
2007	Interpool Inc.	Fortress Investment Group	2014	Material Sciences Corporation	Insight Partners
2007	Guitar Center Inc.	Bain Capital	2014	Chyronhego Corporation	Vector Capital Management LP
2007	Highland Hospitality Corporation	JER Partners	2014	Cleco Corporation	Macquarie Infrastructure and Real Assets (Europe) Ltd
2007	Ryerson Inc.	Platinum Equity	2014	Petsmart Inc.	BC Partners
2007	United Surgical Partners International Inc.	Welsh Carson Anderson & Stowe	2015	Kraft Foods Group Inc.	3G Capital
2007	Catalina Marketing Corporation Inc.	Hellman & Friedman	2015	Keurig Green Mountain Inc.	BDT Capital Partners LLC
2007	Djo Inc. (Old)	Blackstone	2015	Biomed Realty Trust Inc.	Blackstone
2007	Usi Holdings Corporation	Goldman Sachs Capital Partners	2015	Home Properties Inc.	Lone Star Funds
2007	Keane Inc.	CitiGroup Alternative Investments LLC	2015	Strategic Hotels & Resorts Inc.	Blackstone
2007	Smart & Final Inc.	Apollo Global Management	2015	Dealertrack Technologies Inc.	BDT Capital Partners LLC
2007	Pra International Inc.	Genstar Capital	2015	Medassets Inc.	Pamplona Capital Management
2007	Synagro Technologies Inc.	Carlyle Group	2015	Excel Trust Inc.	Blackstone
2007	Safenet Inc.	Vector Capital Management LP	2015	Campus Crest Communities Inc.	Harrison Street Real Estate Capital
2007	Midwest Air Group Inc.	TPG	2015	Om Group Inc.	Apollo Global Management
2007	Deb Shops Inc.	Lee Equity Partners	2015	Premiere Global Services Inc.	Siris Capital Group
2007	Accredited Home Lenders Holding Company	Lone Star Funds	2015	Quality Distribution Inc.	Apax Partners

2007	1-800 Contacts Inc.	Fenway Partners	2015	Informatica Corporation	Permira Advisers
2007	Embarcadero Technologies Inc.	Thoma Cressey Bravo Inc.	2015	Solera Holdings Inc.	Vista Equity Partners
2007	Blair Corporation	Golden Gate Private Equity Inc.	2015	Omnivision Technologies Inc.	Citic Capital
2007	Metromedia International Group Inc.	Salford Capital Partners	2015	Integrated Silicon Solution Inc.	SummitView Capital
2007	Central Parking Corporation	Kohlberg & Company	2015	Zep Inc.	New Mountain Capital
2007	Topps Company Inc., The	Madison Dearborn Partners	2015	E2Open Inc.	Insight Partners
2008	Getty Images Inc.	Hellman & Friedman	2015	Procera Networks Inc.	Francisco Partners Management
2008	Apria Healthcare Group Inc.	Blackstone	2015	Tecumseh Products Company	Atlas Holdings
2008	Bright Horizons Family Solutions Inc.	Bain Capital	2015	Blyth Inc.	Carlyle Group
2008	Kellwood Company	Sun Capital Partners Inc.	2015	EMC Corporation	Silver Lake Partners
2008	Nuco2 Inc.	Aurora Capital Partners	2016	Neustar Inc.	Golden Gate Private Equity Inc.
2008	American Land Lease Inc.	Green Courte Partners	2016	Inteliquent Inc.	GTCR
2008	Angelica Corporation	Lehman Brothers Merchant Banking Partners Inc.	2016	Adt Corporation, The	Apollo Global Management
2008	Lifecore Biomedical Inc.	Warburg Pincus	2016	Teamhealth Holdings Inc.	Blackstone
2008	Clayton Holdings	Greenfield Partners	2016	Rackspace Hosting Inc.	Apollo Global Management
2008	Centerplate Inc.	Kohlberg & Company	2016	Lexmark International Inc.	PAG
2009	Gentek Inc.	American Securities	2016	Qlik Technologies Inc.	Thoma Bravo
2009	Parallel Petroleum Corporation	Apollo Global Management	2016	Press Ganey Holdings Inc.	EQT Partners
2009	Charlotte Russe Holding Inc.	Advent International	2016	Examworks Group Inc.	Leonard Green & Partners

2009	Msc Software Corporation	Symphony Technology Group	2016	Diamond Resorts International Inc.	Apollo Global Management
2009	Eddie Bauer Holdings Inc.	Golden Gate Private Equity Inc.	2016	Marketo Inc.	Vista Equity Partners
2009	Allion Healthcare Inc.	HIG Capital	2016	Cvent Inc.	Vista Equity Partners
2009	Pharmanet Development Group Inc.	JLL Partners	2016	Outerwall Inc.	Apollo Global Management
2009	Sumtotal Systems Inc.	Vista Equity Partners	2016	Infoblox Inc.	Vista Equity Partners
2009	Caraustar Industries Inc.	Wayzata Investment Partners LLC	2016	Fresh Market Inc., The	Apollo Global Management
2009	Entrust Inc.	Thoma Bravo	2016	Diligent Corporation	Insight Partners
2009	I-Many Inc.	LLR Partners	2016	Xura Inc.	Siris Capital Group
2009	Airvana Inc.	ZelnickMedia Corporation	2016	Imprivata Inc.	Thoma Bravo
2009	IMS Health Inc.	TPG	2016	Sciquest Inc.	Accel-KKR
2010	Burger King Holdings Inc.	3G Capital	2016	Blue Nile Inc.	Bain Capital
2010	Commscope Inc.	Carlyle Group	2016	Electro Rent Corporation	Platinum Equity
2010	Nbty Inc.	Carlyle Group	2016	Lionbridge Technologies Inc.	HIG Capital
2010	Syniverse Holdings Inc.	Carlyle Group	2016	Skullcandy Inc.	Mill Road Capital
2010	Gymboree Corporation, The	Bain Capital	2016	Gas Natural Inc.	First Reserve Corporation
2010	Jo-Ann Stores	Leonard Green & Partners	2016	Symmetry Surgical Inc.	RoundTable Healthcare Partners
2010	Infogroup Inc.	CCMP Capital	2016	Accuride Corporation	Crestview Partners
2010	Dyncorp International Inc.	Cerberus Capital Management	2016	Sizmek Inc.	Vector Capital Management LP
2010	Rcn Corporation	Abry Partners	2017	Sciclone Pharmaceuticals Inc.	CDH Investments
2010	Inventiv Health Inc.	Thomas H Lee Partners	2017	Panera Bread Company	BDT Capital Partners LLC
2010	Cke Restaurants Inc.	Apollo Global Management	2017	Staples Inc.	Sycamore Partners
2010	Bway Holding Company	Madison Dearborn Partners	2017	West Corporation	Apollo Global Management

2010	American Commercial Lines Inc.	Platinum Equity	2017	Parexel International Corporation	Pamplona Capital Management
2010	Cpi International Inc.	Veritas Capital	2017	Buffalo Wild Wings Inc.	Roark Capital Group
2010	Thermadyne Holdings Corporation	Irving Place Capital	2017	Time Inc.	Apollo Global Management
2010	Virtual Radiologic Corporation	Providence Equity	2017	Webmd Health Corporation	KKR
2010	Healthgrades Inc.	Vestar Capital Partners	2017	Air Methods Corporation	American Securities
2010	Rescare Inc.	Onex Corporation	2017	Clubcorp Holdings Inc.	Apollo Global Management
2010	Lodgian Inc.	Lone Star Funds	2017	Gigamon Inc.	Evergreen Coast Capital Corporation
2010	Sport Supply Group Inc.	ONCAP	2017	Barracuda Networks Inc.	Thoma Bravo
2010	Phoenix Technologies Ltd	Marlin Equity Partners	2017	Pharmerica Corporation	KKR
2010	Plato Learning Inc.	Thoma Bravo	2017	Terraform Global Inc.	Brookfield Asset Management
2010	Omni Energy Services Corporation	Wellspring Capital Management	2017	Lumos Networks Corporation	EQT Partners
2010	Efjohnson Technologies Inc.	Francisco Partners Management	2017	Exactech Inc.	TPG
2011	Emergency Medical Services Corporation	Clayton Dubilier & Rice Inc.	2017	Xactly Corporation	Vista Equity Partners
2011	ImmuCor Inc.	TPG	2017	Trc Companies Inc.	New Mountain Capital
2011	Sra International Inc.	Providence Equity	2017	Bazaarvoice Inc.	Marlin Equity Partners
2011	Lawson Software Inc.	Golden Gate Private Equity Inc.	2017	Nutraceutical International Corporation	HGGC
2011	Blackboard Inc.	Providence Equity	2017	Arc Logistics Partners	Warburg Pincus
2011	Epicor Software Corporation	Apax Partners	2017	Tangoe Inc.	Marlin Equity Partners
2011	Smart Modular Technologies (Wwh) Inc	Silver Lake Partners	2017	West Marine Inc.	Monomoy Capital Partners

2011	Ckx Inc.	Apollo Global Management	2017	Ruby Tuesday Inc.	NRD Capital
2011	Apac Customer Services Inc.	One Equity Partners	2017	Nci Inc.	HIG Capital
2011	California Pizza Kitchen Inc.	Golden Gate Private Equity Inc.	2017	Cdi Corporation	AE Industrial Partners
2011	Renaissance Learning Inc.	Permira Advisers	2017	Rocket Fuel Inc.	Vector Capital Management LP
2011	Harbin Electric Inc.	Baring Private Equity Partners Asia	2017	Ari Network Services Inc.	True Wind Capital
2011	Rural/Metro Corporation	Warburg Pincus	2017	Calpine Corporation	Energy Capital Partners
2011	American Dental Partners Inc.	JLL Partners	2018	Envision Healthcare Corporation	KKR
2011	Primedia Inc.	TPG	2018	Gramercy Property Trust	Blackstone
2011	Global Defense Technology & Systems Inc.	Ares Management	2018	Financial Engines Inc.	Hellman & Friedman
2011	Conexant Systems Inc.	Golden Gate Private Equity Inc.	2018	Ply Gem Holdings Inc.	Clayton Dubilier & Rice Inc.
2011	China Fire & Security Group Inc.	Bain Capital	2018	Imperva Inc.	Thoma Bravo
2011	Novamed Inc.	HIG Capital	2018	Web.Com Group Inc.	Siris Capital Group
2011	Tollgrade Communications Inc.	Golden Gate Private Equity Inc.	2018	Apptio Inc.	Vista Equity Partners
2011	Silverleaf Resorts Inc.	Cerberus Capital Management	2018	Mindbody Inc.	Vista Equity Partners
2011	Kinetic Concepts Inc.	Apax Partners	2018	Analogic Corporation	Altaris Capital Partners
2011	Matrixx Initiatives Inc.	HIG Capital	2018	Cambium Learning Group Inc.	Veritas Capital
2012	Jda Software Group Inc.	New Mountain Capital	2018	Fogo De Chao Inc.	Rhone Group
2012	Par Pharmaceutical Companies Inc.	TPG	2018	Rpx Corporation	HGGC
2012	Knight Capital Group Inc.	General Atlantic	2018	Corium International Inc.	Gurnet Point Capital
2012	P F Chang'S China Bistro Inc.	Centerbridge Partners	2018	Verifone Systems Inc.	Francisco Partners Management

2012	Mmodal Inc.	One Equity Partners	2018	Sparton Corporation	Cerberus Capital Management
2012	Deltek Inc.	Thoma Bravo	2018	Bravo Brio Restaurant Group Inc.	Spice Private Equity AG

#### Appendix 10: N° of Occurrences of Each Dummy

	Clubs	Clubs Prominent	LBO	LBO*Clubs Prominent	Cash	T. Location	Sector
<b>Non-Crisis</b>	61	37	94	16	157	24	117
<b>Crisis</b>	15	11	28	5	51	10	35
<b>Total</b>	<b>76</b>	<b>48</b>	<b>122</b>	<b>21</b>	<b>208</b>	<b>34</b>	<b>152</b>

#### Appendix 11: Non-Financial Crisis Period Descriptive Statistics (in \$million)

	Non-Financial Crisis Period					
	Mean	Median	Maximum	Minimum	Q1	Q3
<b>Deal Value</b>	3 235	1 100	67 000	6	386	2800
<b>Pre-Deal Assets</b>	2 124	532	47 540	10	203	1 371
<b>Pre-Deal EBITDA</b>	273	83	5 385	(433)	25	219

#### Appendix 12: Financial Crisis Period Descriptive Statistics (in \$million)

	Financial Crisis Period					
	Mean	Median	Maximum	Minimum	Q1	Q3
<b>Deal Value</b>	1 374	470	24 000	40	268	470
<b>Pre-Deal Assets</b>	960	455	18 806	31	214	996
<b>Pre-Deal EBITDA</b>	138	60	2 259	(47)	21	158

### Appendix 13: Top50 Prominent PE Firms in the sample as acquirers

#### Top50 Prominent PE Firms in the sample

TPG	HIG Capital
Advent International	Insight Partners
Apax Partners	KKR
Apollo Global Management	L Catterton
Ares Management	Leonard Green & Partners
Bain Capital	Madison Dearborn Partners
BDT Capital Partners LLC	New Mountain Capital
Blackstone	Permira Advisers
Brookfield Asset Management	Platinum Equity
Carlyle Group	Silver Lake Partners
Clayton Dubilier & Rice Inc.	Stone Point Capital
Clearlake Capital Group	Thoma Bravo
CVC Capital Partners	Vista Equity Partners
EQT	Warburg Pincus
Francisco Partners Management	Goldman Sachs
General Atlantic	Merrill Lynch
GTCR	Morgan Stanley
Hellman & Friedman	

## Appendix 14: Multivariate regressions explaining target returns (Prominent Firms)

This table has the results of regressions of Raw Returns, BHAR and CAR, and expressed in percentage. Clubs Prominent is an indicator variable for the deal categories and is equal to 1 if the acquirer is a club of prominent PE firms, and zero otherwise. Cash is an indicator variable equal to 1 if the takeover is 100% cash, and zero otherwise. Toehold is the percentage held by the acquirer before the announcement date. Target Location is an indicator variable equal to 1 if the target is from a different country relative to the acquirer (cross-border acquisition), and zero otherwise. Sector is an indicator variable equal to 1 if the target and the acquirer operate in different major sectors, and zero otherwise. EBITDA/Assets is a ratio calculated by dividing the last available year of the pre-deal target EBITDA (m USD) by the last available year of the pre-deal target assets (m USD). Log (Deal Value) is the logarithm of the price paid for the target by the acquirer (m USD). Crisis is a dummy equal to 1 if the acquisition was announced in the crisis period (2008 – 2011), and zero otherwise. Crisis\*Clubs Prom is the interaction between the dummy Crisis and the dummy Clubs Prominent. Industry control dummies included. Heteroskedasticity consistent standard errors and covariance. \*\*\*, \*\*, \* indicates that the coefficient estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

**Target's returns – Prominent PE Firms**

	RAW			BHAR		CAR		
	(-1,1)	(0,20)	(-20,20)	(0,20)	(-20,20)	(-1,1)	(0,20)	(-20,20)
<b>Clubs Prom</b>	-0.077***	-0.072***	-0.066**	-0.078***	-0.070*	-0.077***	-0.075***	-0.069**
<b>Cash</b>	0.008	0.003	0.005	-0.001	0.011	0.005	0.002	0.012
<b>Toehold</b>	-0.320	-0.250	0.586***	0.110	0.634**	-0.287	0.010	0.747***
<b>Target Location</b>	-0.014	-0.006	-0.021	-0.004	-0.005	-0.015	-0.010	-0.024
<b>Sector</b>	0.032	0.032	0.026	0.033	0.054	0.034	0.035	0.047
<b>EBITDA/Assets</b>	-0.037	-0.031	-0.045	-0.041	-0.070	-0.041	-0.042	-0.065
<b>Log (Deal Value)</b>	-0.019	-0.023	0.005	-0.0167	0.002	-0.018	-0.019	0.001
<b>Crisis</b>	-0.010	-0.013	0.025	0.014	0.026	-0.009	-0.003	0.019
<b>Crisis*Clubs Prom</b>	0.068	0.081	0.002	0.053	0.039	0.071	-0.064	0.017
<b>Constant</b>	0.230***	0.341***	0.186*	0.413***	0.110	0.304***	0.376***	0.127
<b>Observations</b>	198	198	198	198	198	198	198	198
<b>R-Squared</b>	0.15	0.15	0.15	0.13	0.12	0.14	0.13	0.13