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**Private Equity Club Deals: Value Creation, Competition and
Collusion Motives**

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Preface and Acknowledgments

September 2019 and the Master's introduction day feel so far away now. Never I would have thought I would have been writing my Master's Thesis from an apartment in London, quarantined with my boyfriend. Courtesy of the coronavirus pandemic. Never I would have guessed that, after nearly four years, my farewell with The Netherlands would have been so abrupt, leaving the country in March on one of the last available outgoing flights. Gel sanitiser at hand and Schiphol Airport deserted.

Now more than ever, I feel proud of who I become after these past four years. Friends and universities played a crucial role in forging me into the person I am today. In particular, during this year at the Erasmus University Rotterdam I personally and academically grew tremendously. I would not be here today with my accomplishments without the support of the professors of the Erasmus University Rotterdam and my supervisor Yashvir Gangram Panday, who I wish to thank, and of family and friends. Specifically, I would like to thank my mother, who always supported and believed in me, and her work ethic is of constant inspiration. I also would like to thank my boyfriend, who pushed an insecure 19-year-old me into believing in herself. Finally, I would like to thank all the friends I made in Amsterdam, Paris, and Rotterdam, who now represent a fundamental part of my life.

I became interested in private equity because, frankly, I firstly was unaware what it was, which drove me to learn more about it over these years and eventually gain interest. I personally like to think of it as the perfect combination between qualitative and quantitative work, through the application of strategic investments. I then chose private equity club deals as my thesis topic after following the seminar by Sebastian Pfeil *Advanced Corporate Finance: Private Equity*. During the seminar, I had to analyse the paper on private equity club deals by Officer, Ozbas and Sensoy (2010) as well as carry out a team-based research study on the deal pricing differences between private and public acquirers. When analysing the paper by Officer et al. (2010), I also had to search for further literature on the topic and I then discovered the paper by Marquez and Singh (2013), whose model I test in this research study for a new interpretation of the effect of low competition levels and bidding costs on target returns. Further, visiting the private equity firm Holland Capital during the Finance Day event organised by the study association EFR increased my interest in the practice. I am also pleased to say that this autumn I will start an internship in Milan at the private equity firm FSI – Fondo Strategico Italiano, part of Cassa Depositi e Prestiti.

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Abstract

In order to investigate possible collusion motives and target value creation, this paper analyses the effect of club deals on target returns, performance and competition levels from 1984 to 2019, focusing on deals by prominent private equity (PE) firms and the pre-2006 and post-2014 periods. Testing the model by Marquez and Singh (2013), I analyse whether possible collusion motives might depend on competition settings. The aim of this paper is to find a bridge between the studies of Officer, Ozbas and Sensoy (2010) and Boone and Mulherin (2011). Using a comprehensive sample from SDC of completed LBOs with U.S. targets and acquirers, I perform univariate and multivariate analyses (event study methodology, fixed effects and probit models). Even though I find evidence that consortia of prominent PE firms pay a 24% takeover premium discount compared to single prominent PE firms, I find no evidence of club deals affecting competition levels and indicative of possible collusive behaviour. Consortia by prominent PE firms add value to the target by increasing its post-buyout performance. Club formation is more likely before 2006 and in large deals, while it is less likely after 2014. Overall, results indicate that club deals by prominent PE firms are target value adding, that club deal activity was higher prior to 2006, and that the discount obtained in takeover premia is likely to be a by-product of auction settings and competition rules.

Keywords: *private equity, club deals, leveraged buyouts, collusion, takeover auctions, competition*

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1. Introduction

The beginning of the past century witnessed the birth of a new practice in the market for corporate control: mergers and acquisitions¹ (M&A). In such a market, M&As represent one of the most important decisions for managers as they are used for corporate restructuring and development (Berk & DeMarzo, 2017; Ghosh & Dutta, 2016). M&A entails that one firm, the *bidder* or *acquirer*, wants to buy another firm, the *target* or *seller*; this transaction is called a *takeover* and it requires the acquirer to buy the target's stocks or assets (Berk & DeMarzo, 2017). The first wave of M&A occurred in the 1920s and, as this practice for corporate development gained popularity, more waves subsequently characterised the 20th century, specifically in the 1960s, 1980s and 1990s (Cartwright & Schoenberg, 2006; Gugler, Mueller, Yurtoglu, & Zulehner, 2003). M&A started to be implemented firstly in North America and Great Britain, but by the 1990s it was widely used at the global level, both in developed and developing countries (Ghosh & Dutta, 2016; Gugler et al., 2003). Given M&As' documented positive effect on target performance through corporate restructuring and their role played in boosting foreign direct investment (FDI) as well as the economic development of certain sectors, M&A came to play an important role in the global economy (Hoen, 2014; United Nations, 1998; Dobre, Brad, Ciobanu, Turlea & Caloian, 2013; Cartwright & Schoenberg, 2016; Guziejewska, Grabowski & Bryndziak, 2014). However, M&A is a complex process that depends highly on how the organisational integration of the target is performed and there is still ambiguity on the effect on acquirers' post-transaction performance in the long-term (Cartwright & Schoenberg, 2006; Agrawal & Jaffe, 2000; King, Dalton, Daily & Covin, 2004; Kemal, 2011; Trichterborn, zu Knyphausen-Aufseß & Schweizer, 2016).

During the second half of the 20th century and with a peak in the 1980s, a new practice for corporate restructuring and development emerged as opposed to M&A: leveraged buyouts (LBOs) (Kaplan & Strömberg, 2009; Jensen, 1989; Bradford & Smith, 1997). The LBO boom started also in North America, specifically the U.S., probably due to a more favourable tax environment, with a tax code that would allow investment firms to collect tax saving benefits (Scholes & Wolfson, 1989). It quickly spread as a popular practice to Canada and, to some extent, the United Kingdom: from 1985 to 1989 together with the U.S. they accounted for 89% of the total LBO transactions and for 93% of total transaction value at the global level (Strömberg, 2008). LBO practice is characterised by a specialised investment firm acquiring

¹ In this paper it is used interchangeably as M&A identifies a type of corporate development practice.

another firm or division, using the lowest amount of equity and the highest amount of outside debt financing (Kaplan & Strömberg, 2009; Eckbo & Thorburn, 2012). Due to this financing structure and the firms' private ownership status, the capital investors of such investment firms refer to themselves, and are referred to, as part of a "Private Equity" (PE) firm (Bradford & Smith, 1997; Kaplan & Strömberg, 2009). After the takeover, the target firm becomes then privately owned (Eckbo & Thorburn, 2012). A PE firm raises equity capital through a PE fund. PE funds are most likely to be "closed-end": investors are not allowed to withdraw their money until the life of the fund is terminated, which is usually on a previously fixed date (Kaplan & Strömberg, 2009). Those who collect the capital are referred to as *general partners* (GPs), while those who invest to create the equity capital are known as the *limited partners* (LPs). PE firms therefore represent shell companies in which LBOs' sophisticated investors inject equity capital through the creation of a fund, usually together with a small fraction of contribution from the PE firm's management (Eckbo & Thorburn, 2012). The objective of the takeover is to increase over three to five years the target's operational efficiency and overall performance through a strategic operational restructuring and development, in order to time the market and "exit" by selling the company at a higher price for which it had originally been bought, often through an IPO (Bradford & Smith, 1997; Eckbo & Thorburn, 2012). Over time, PE firms constructed a record for investing mainly in mature and low-growth industries that have a limited additional requirement of capital expenditures (Eckbo & Thorburn, 2012).

Given the initial steady increase in the popularity and success of PE firms, Jensen (1989) at the time predicted that they would soon become the prominent practice in the market for corporate control. He based this prediction on the characteristics that differentiated PE firms from public firms, such as having a concentrated ownership stake in portfolio companies, lower associated agency costs, and being highly efficient with low overhead costs. However, already in the 1990s there was proof of the contrary: the junk bond crashed and many PE firms declared bankruptcy or defaulted leading to the disappearance of LBOs of public companies, even though it persisted in the private-to-private transactions market (Kaplan & Strömberg, 2009). The situation took then a positive turn for PE firms in the early 2000s: a new wave of LBOs took place in the U.S. resulting in the reappearance of public-to-private LBO transactions (Kaplan & Strömberg, 2009). PE firms lived a golden age up until the financial crisis in 2008, which resulted in another decrease in LBO activity at the global level (Kaplan & Strömberg, 2009). However, the popularity and success that PE firms saw taking place in the early 2000s did not mirror a positive global outlook of this corporate practice. In fact, the origin of their returns and the whole practice of raising high amounts of debt to often overpay for assets started

to be questioned and they were soon viewed negatively by the rest of the world; they were even referred to as *locusts*, or more nicely *grasshoppers*, and associated with stripping assets and destroying job positions (Froud & Williams, 2007; Phalippou, 2009; Perry & Williams, 1994; Antoni, Maug & Obernberger, 2019). Nevertheless, Antoni et al. (2019) do not find significant evidence of PE firms making discretionary decisions to increase employee layoffs. However, their empirical analysis shows an increase in employee turnover and a higher overall reduction in employment following an LBO.

Since the first doubt on whether target improvements through PE were *bona fide* or just for seeking private benefits, PE firms have been under the scrutiny of the public and academic eye. Previous literature investigates the actual value added to the target, the acquisition premium paid by PE firms vis-à-vis the one paid usually in public takeovers and the origin of the returns (e.g. Chamberlain & Fabre, 2016; Moskowitz & Vissing-Jørgensen, 2002; Palepu, 1990). Scholars find evidence of a negative relationship between the tax savings obtained by the acquiring PE firm and the takeover premium it paid, of a relation between realised tax returns from leverage with realized returns, of manipulation of accruals for the year prior to the announcement of the takeover's intention, and of underperformance compared to benchmark after management fees (Jenkinson & Stucke, 2011; Guo, Hotchkiss & Song, 2011; Perry & Williams, 1994; Phalippou, 2009). However, LBOs are still a popular alternative to M&As in the market for corporate control due to benefits such as lower agency costs, efficiency improvements, stronger managerial incentives, a higher return on invested capital (ROIC), and the possibility of obtaining an alternative source of financing through strong financial partners that can add value through oversight and direction (Jensen, 1989; Guo et al., 2011; Barger, Schlingemann, Stulz & Zutter, 2008; Bradford & Smith, 1997). Moreover, scholars find also that the value added to targets by club deals is heterogenous across deals and is determined by CEO characteristics (e.g. overconfidence level), skills and expertise (Kaplan, Klebanov & Sorensen, 2012; Malmendier & Tate, 2008; Acharya, Gottschalg, Hahn & Kehoe, 2013).

As LBOs gained popularity, club deals by PE firms, in particular, caught the attention of numerous academics, raising questions on the differences in takeover premia with sole-sponsored LBOs, their role played in competition during a target bidding and the possible related welfare implications (Officer, Ozbas & Sensoy, 2010; Guo et al., 2011; Boone & Mulherin, 2011; Kim & Palia, 2014; Cramton & Schwartz, 2000; Graham & Marshall, 1989; Marquez & Singh, 2013). Club deals are made by a consortium of PE firms that decides to jointly bid, often when an LBO requires an elevated amount of leverage (Officer et al., 2010; Boone & Mulherin, 2011). However, there is still an open debate of their effect on the takeover

premium. The main argument revolves around a possible depression in prices and increase in bidding power due to the decrease in competition obtained by the PE firms through a joint bid, and whether this negatively affects the target bargaining power, leading to a lower takeover premium (Officer et al., 2010; Boone & Mulherin, 2011; Marquez & Singh, 2013). Club deals therefore have also been widely researched in the auction and regulatory economics literature, in particular investigating possible collusive motives (e.g. Graham & Marshall, 1989; Marquez & Singh, 2013; Hendricks & Porter, 1992; Cramton & Schwartz, 2000). Specifically, Marquez and Singh (2013) develop a theoretical model in which they analyse the role played by bidding costs in competition and club formation. Through their model they find mathematical proof that, when there is enough competition, club deals by PE firms are beneficial to the target. However, this can depend highly on economy-wide, firm, deal and manager-specific characteristics, creating heterogeneity on the positive value added to targets in LBOs (Achrya, Gottschalg, Hahn & Kehoe, 2013; Malenko & Malenko, 2015).

In this paper, I therefore investigate target value creation and possible collusion motives in PE club deals, with a focus on deals by prominent PE firms. I apply the model by Marquez and Singh (2013) in order to test whether bidding costs and competition levels play a role in explaining possible collusive behaviour. By applying the authors' theoretical model, I aim at finding a bridge between the findings by Officer et al. (2010) and Boone and Mulherin (2011). More specifically, my research question is as follows: "What role do private equity club deals play in competition and target value creation?". I also try to answer the following sub-questions: (a) "What is the effect of PE club deals on post-buyout target performance?", (b) "To what extent do bidding costs and competition levels affect target returns and club formation?", and (c) "Are there possible collusion motives in PE consortia?".

This paper is structured as follows. Firstly, in Section 2, a literature review is carried out and the hypotheses derived from it are presented. In Section 3, the sample construction, databases and sources used as well as the selection criteria applied are explained. Subsequently, in Section 4, the methodology for this research study is presented through a thorough explanation of the econometrical models and their application to the data. Section 5 reports the results from the various univariate and multivariate analyses, as they were introduced in Section 4. Finally, Section 6 is a discussion followed by a conclusion on this research study by comparing and contrasting the results obtained and the hypotheses made with the previous literature, as well as by proposing possible alternative explanations for unexpected or ambiguous results. In the conclusion I also discuss limitations to this study and recommendations for future research.

2. Literature Review and Hypotheses

2.1 Differences in Takeover Premium

Already in the M&A literature, the effect of the takeover practice on bidder and target returns and in general on the overall post-transaction performance has been extensively studied (e.g. Cartwright & Schoenberg, 2006; Agrawal & Jaffe, 2000; King et al., 2004; Kemal, 2011; Trichterborn et al., 2016). Despite the clear evidence of the positive effect of M&A, there is still ambiguity on the effect of LBO on target performance and returns (Cartwright & Schoenberg, 2006; Palepu, 1990; Moskowitz & Vissing-Jørgensen, 2002). One of the possible reasons for this is that, contrary to M&As, LBOs do not create synergies, leading to heterogeneity in the value added to targets by PE firms (Achrya et al., 2013; Kaplan et al. 2012). Moreover, Barger et al. (2008) find evidence of differences in takeover premium between acquisitions carried out by private versus public firms. Specifically, they find that the acquisition premium is lower for private than for public bidders.

Further literature then analyses the specific effect of PE club deals on takeover premia. Officer et al. (2010) were the first ones to analyse this relationship, followed shortly after by Boone and Mulherin (2011). Officer et al. (2010) find that prominent PE firms that form a consortium would pay a lower takeover premium. Their main argument for explaining such an event is based on possible collusion motives by PE firms. As auction theory explains, a decrease in competition leads to a depression of prices (Krishna, 2002). In their paper, Officer et al. (2010) find evidence that might link to possible collusion motives as the takeover did not result in any positive added value to the target, as measured by its returns, compared to targets in sole-sponsored LBOs and public acquisitions, while the bidder benefited from a lower acquisition premium. This difference is also economically large as they find that PE consortium-backed targets receive a takeover premium that is lower by around 40% compared to sole-sponsored LBOs.

Contrary to Officer et al. (2010), Boone and Mulherin (2011), who also include smaller deals in their sample, do not find any evidence of anticompetitive effects of PE club deals. Marquez and Singh (2013) argue that these difference between the two research studies might be because of the sample selection: including small deals entails including bids with higher competition (i.e. more bidders), and therefore a lower chance of club formation resulting in a depression of prices (i.e. lower takeover premium). However, as explained by Officer et al. (2010), prominent firms are the ones that are more likely to have a noticeable impact on competition and therefore are more relevant for when analysing the impact of PE consortia on

competition prices. Following this reasoning, I expect PE consortia to receive a takeover premium discount compared to sole-sponsored LBOs and public acquisitions. My first hypothesis follows:

Hypothesis 1: *Prominent PE firms that jointly bid receive a discount on the acquisition premium compared to sole-sponsored LBOs by prominent PE firms.*

Even though Officer et al. (2010) might have been the first ones to study and carry out an empirical analysis on the matter, they were not the first ones to investigate possible collusive behaviour and effects on target returns of PE club deals. In fact, in 2006 the U.S. Department of Justice (DoJ) started an informal inquiry among some of the world's leading PE funds into the possible anticompetitive effects of PE consortia (Berman & Sender, 2006). Relevant figures such as Josh Lerner, a professor at Harvard Business School, and Stephen Pagliuca, current co-chairman of Bain Capital, at the time highlighted the increasing relevance of PE players being in teams in the buyout bidding process and of the possibility of collusive behaviours (Berman & Sender, 2006). Consistent with this event, throughout their empirical analysis Officer et al. (2010) find the period prior to 2006 to be a watershed in the effect of PE club deals on target returns, with a greater discount in PE club deals in the pre-2006 period. Moreover, later in 2007 some investors, including pension funds and individuals, filed a lawsuit against some of the largest PE firms. This lawsuit included allegations of collusive behaviour aimed at reducing competition and buyout prices through an unofficial agreement of not bidding in one another's deals (Alden, 2014). In 2014, the PE firms involved in the lawsuit decided to settle, with a total settlement payment of 590.5\$ million (Alden, 2014). After seven years, the decision to stop the fight against the lawsuit was based on the risk of high monetary damage as well as negative repercussions on the firms' reputations (Alden, 2014).

I would expect PE firms to be more cautious in trying to engage in unofficial collusive behaviour when such behaviour it is not investigated by the authorities or under the scrutiny of the public eye. This is what indeed Officer et al. (2010) find as their analysis shows that takeover premium discounts are significantly lower for the period before the inquiry of the DoJ. However, given that the paper was published in 2010, the authors do not have the chance to investigate the effects on takeover premium discounts of the news regarding the settlement by PE firms for the lawsuit that was filed against them back in 2007. As market prices react to the news (Giglio & Shue, 2014), I am interested in analysing whether also the news of the settlement in 2014 functioned as a watershed in the activity of collusive behaviours, as the

inquiry by the DoJ did in 2006. PE firms may feel less inclined to collude to avoid a second lawsuit, but it can also be true that once the lawsuit has been settled some firms may believe that collusive behaviour is less under the scrutiny of the public eye. I would expect collusive activity to be slightly higher in the post-2014 period relative to the 2006-2014 period, given that the inquiry by the DoJ already played a role in deterring cartel activity (Officer et al., 2010) and that the lawsuit that would put the focus on collusive behaviour by PE firms had been settled. Based on this evidence, I therefore expect prominent PE firms to reduce possible anticompetitive effects during the post-2006 period and in the pre-2014 period, as they may represent a watershed in the intensity of collusive activity by PE firms. I then expect PE firms to obtain a higher discount on takeover premium in the pre-2006 and post-2014 periods. My second hypothesis follows:

Hypothesis 2: *Club deals made by prominent PE firms had a higher discount in the pre-2006 and post-2014 periods.*

2.2 Benign Reasons for Club Formation and Value Creation

PE firms can decide to create a consortium and bid together for a target for both benign and malign reasons. The latter ones refer mainly to possible collusive motives for prices depression and more favourable deals: club formation lowers competition levels as the number of competitors decreases, which can result in a reduction of prices and therefore in a discount on the takeover premium (Officer et al., 2010; Boone & Mulherin, 2011; Marquez & Singh, 2013; Smith, 1983). On the other hand, benign reasons may be, for instance, diversification motives or deal quality certification to debt financiers, which is driven by the manifold interests of players with high expertise and knowledge in the field in one specific deal (Officer et al., 2010). In line with these benefits from joint expertise and knowledge, PE firms may form a consortium also because they believe to have complementary abilities among their members, such as pooling resources and sharing information (Song, 2004; Scellato & Ughetto, 2013; Cho, Jewell & Vohra, 2002). Another important reason for which PE firms may decide to club without any anticompetitive motive is capital constraints: firms may opt to jointly bid in order to pool resources for an LBO that requires a very high amount of debt (Officer et al., 2010). Therefore, PE firms decide to join forces in order to be able to bid for a deal that, because of its large size, requires a significant amount of leverage (Shivdasani & Wang, 2011). Moreover, Officer et al. (2010) find evidence that target firms with higher institutional ownership face a mitigated effect of club deals on takeover premia. Based on this evidence, I investigate capital

constraints motives for club formation among PE firms and whether institutional ownership plays a role in mitigating the discount club deals by prominent PE firms might obtain on takeover premia. I expect club deals by prominent PE firms to be larger than deals undertaken in sole-sponsored LBOs and institutional ownership to have a negative effect on discounts that may be associated with PE consortia takeovers. My third and fourth hypothesis follows:

Hypothesis 3: *PE club deals are on average larger than those of sole-sponsored LBOs.*

Hypothesis 4: *Institutional ownership mitigates the possible discount effect on takeover premia in club deals by prominent PE firms.*

Building on the benign motives of club formation in LBOs by PE firms, several benefits for targets can emerge from being represented by a consortium of PE firms compared to being part of a sole-sponsored LBO. In their theoretical model, Marquez and Singh (2013) explain that PE firms do indeed add positive value (φ) to the target when competition is not too low, therefore when there is not a possibility of collusion by the bidding firms. These benefits may arise from manifold representations of expert and knowledgeable sponsors in the field, which is even more relevant given the low agency costs in LBOs (Bradford & Smith, 1997; Jensen, 1989). Lower agency costs also allow private bidders to retain targets' CEOs, which in turn enables them to retain valuable managerial target-related expertise (Bargeron, Schlingemann, Stulz, & Zutter, 2017). However, PE firms in general were also seen negatively by the world as they have been accused of pursuing short-term profits, manipulating earnings pre-buyout and putting employees' jobs at the target firm at risk (Antoni et al., 2019; Phalippou, 2009; Perry & Williams, 1994). Nevertheless, there is little evidence of the causal effect of LBOs on employee layoffs or whether PE firms strategically pursue them (Palepu, 1990; Antoni et al., 2019). Moreover, previous literature documented that if the members of the PE firms in the club deal have complementary abilities such as pooling resources and sharing information, targets should experience a higher *ex-post* performance, as measured by profitability and size, than targets in sole-sponsored LBOs (Wilson, Wright & Siegel, 2012; Scellato & Ughetto, 2013). Similarly, Bull (1989) find that compared to prior to an LBO, target performance increases *ex-post*, and it does so beyond savings from income tax.

Given the lack of evidence of the negative effects on employment of LBOs and the extensive literature on the possible benefits targets may obtain being backed by a consortium of PE firms, I expect a greater post-buyout target performance in PE club deals compared to

sole-sponsored LBOs. Profitability has been widely used by academics in the buyout literature to empirically test firm performance (Kaplan, 1989; Cressy, Munari & Malipiero, 2007; Long & Ravenscraft, 1993). Furthermore, target performance can be also measured by growth in size: it seems reasonable to argue that, given the focus of LBOs on corporate renewal and the additional benefits gained from PE consortium, target firms are greater in size post-buyout and in PE club deals (Scellato & Ughetto, 2013; Jensen, 1989). As explained by Scellato and Ughetto (2013), these effects can be observed from a year prior to two years after the date of deal announcement. Based on this evidence and reasoning, I develop two more hypotheses:

Hypothesis 5: *Compared to single prominent PE firms, consortia of prominent PE firms increase target profitability over the two years following the takeover.*

Hypothesis 6: *Compared to single prominent PE firms, consortia of prominent PE firms positively impact target growth over the two years following the takeover.*

2.3 Anticompetitive Effects

As previously mentioned, PE firms might have so-called “malign” reasons for clubbing in a bidding process by acting as *cartels*: associations whose purpose is to maintain the price high by reducing competition (Officer et al., 2010; Boone & Mulherin, 2011; Smith, 1983; McAfee & McMillan, 1992). Bidding “rings”, “pies” and “kippers” are other names used to refer to cartels (McAfee & McMillan, 1992). Bidding rings are illegal with many antitrust policies active in the U.S.; however, collusion in auctions is still an occurring phenomenon, to the point where it represents a large fraction of antitrust investigations (Krishna, 2002). Even though collusive motives among PE firms are hard to prove empirically due to the lack of an instrumental variable for club formation, the creation of consortia in competition settings related to a subsequent depression in prices creates at least the appearance of such an intent (Smith, 1983; Officer et al., 2010). Joint bidding can depress prices by lowering the number of bids tendered, which results in an anticompetitive effect (Smith, 1983). Even though it may seem that collusion benefits the bidders, this is true only for the shorter term: successful collusive behaviours will attract new firms to the industry by restoring competition levels (McAfee & McMillan, 1992). Moreover, if the relationships and trust among the members of a cartel are not strong enough and some are unsatisfied with how the proceeds are distributed among them, they might decide to turn against the cartel and report the collusive behaviour to the authorities (McAfee & McMillan, 1992). Therefore, in order for collusion to be successful

the consortium needs to have strong relationships and bonds. Even if there are such downsides to collusive behaviour, its presence was feared enough by the DoJ that it started an inquiry among the most prominent PE firms in 2006. However, the inquiry never followed through and therefore failed in proving any anticompetitive behaviour. Later in 2007, other investors filed a lawsuit against some of the largest PE firms (Berman & Sander, 2006; Alden, 2014). At a conference back in 2006, Stephen Pagliuca highlighted the rising concerns on PE consortia and collusive behaviour: “It is just that now it isn’t one on one but teams versus teams” (Berman & Sander, 2006).

Marquez and Singh (2013) investigate the dynamics of club formation in relation to competition levels and bidding costs in an auction setting through a theoretical model. The authors mathematically prove that consortia are detrimental to target revenues when competition is either very high or very low, as measured by the number of bidders. They explain that if there are only few bidders, club formation leads to a depression in acquisition prices and it harms the target. On the other hand, if there are too many potential acquirers, bidding costs determine prices rather than the number of competitors as they set an entry barrier and then negatively affect the target. When there are too many potential acquirers the formation of a value-adding club disincentivises other single PE firms to bid, giving the consortium a greater bargaining power. In this setting bidding costs also play a role as they represent an entry barrier that excludes all the bidders that cannot afford the cost. Excluding such bidders leads then to a loss of acquirers that might have possibly been value adding to the target. Through their theoretical model, Marquez and Singh (2013) illustrate a nonmonotonic relationship between club formation and bidding costs: club formation benefits the target through value creation when there is an intermediate number of potential bidders.

Bidding costs are defined by the authors as due diligence and agency review related costs, therefore higher bidding costs are associated with larger deals. In their model, the authors define N as the number of bidders, c as the bidding costs, and φ as the inefficiencies in value creation from club formation. The bounds for which:

- $\varphi = 0$: no value creation for the target from club formation
- $\varphi = 1$: no efficiency loss and value creation to the target by club formation

Value creation indicates that when two or more bidders decide to form a club, the total value of the consortium to the target is the combination of the value of each single bidder, plus an extra that represents the value created by the specific union of the bidders. Specifically:

$$\begin{aligned}
\text{Club value} &= x_{CB} \in [0, 1 + \varphi] \\
&= \max\{x_1, x_2 \dots x_n\} + \varphi \min\{x_1, x_2 \dots x_n\}
\end{aligned}
\tag{1}$$

Where x_i indicates each firm taking part in the club.

Marquez and Singh (2013) show through their model that greater value creation, therefore higher φ , is associated with greater revenue to the target, making the club relatively more attractive compared to sole bidders. Nevertheless, this positive effect for the target is conditional on the level of competition N , therefore how many competitors (i.e. potential bidders) there are, and on bidding costs c . Only with sufficient competition levels, club formation is beneficial to the target, as the value creation effect dominates anticompetitive effects of low competition settings. A setting with low competition levels negatively affects the target because it depresses its expected revenue value and therefore the price that it is supposed to receive. It follows that in such settings with low N , clubs can obtain cheaper deals. In such a setting, bidding costs are assumed to be zero for now. In the opposite scenario, if it is the situation that N is very high and there are bidding costs, for which $c > 0$, this could create entry barriers and prevent potentially value-creating bidders to participate in the bidding process, as they might not be able to afford the cost c . Under free entry conditions and with N sufficiently large, letting then $N \rightarrow \infty$, bidders decide to participate in the bidding process as long as:

- $\pi_{NC} \geq c$

and

- $\pi_{CB} \geq c$

The free entry conditions under equilibrium imply then:

- $\pi_{NC}(N_{NC}) = c$

- $\pi_{CB}(N_{CB}, \varphi) = c$

Where π_{NC} and π_{CB} indicate the expected *ex-ante* profits that would be made by any bidder in the case of no club formation and of club formation, respectively. $\pi_{NC}(N_{NC})$ indicates the profit to each bidder depending on no club formation, and similarly $\pi_{CB}(N_{CB}, \varphi)$ indicates the profit to each bidder depending on club formation and the value creation factor φ . This setting with very high N and the presence of bidding costs c negatively impacts the target as it would be deprived of potentially valuable acquirers. Therefore, in the case of very low N and $c = 0$ the numbers of bidders are exogenously determined; while, when N is very high and $c > 0$ the number of bidders is determined by free entry.

The difference in revenues ΔR created by a setting without any clubs (R_{NC}) and one with club formation (R_{CB}) conditional on N , c , and φ is defined for both scenarios, respectively, as:

$$\text{Low competition: } \Delta R(N) = R_{NC}(N) - R_{CB}(N, \varphi) \quad (2)$$

$$\text{High competition: } \Delta R(N_{NC}N_{CB}, \varphi|c) = R_{NC}(N_{NC}) - R_{CB}(N_{CB}, \varphi) \quad (3)$$

In the setting with low competition levels linked to equation (2), the authors mathematically prove that ΔR decreases in the degree of efficiency of the club: greater revenue to the target arises from greater efficiency of club formation. Instead, in the setting of free entry with $N \rightarrow \infty$ and $c > 0$ they prove that ΔR is increasing in the degree of efficiency of the club. The latter is due to the fact that the presence of a club puts sole bidders in a worse-off position, which increases with the efficiency of the club. Therefore, when φ increases for a club, independent bidders are more disincentivised to enter the bidding process, leading to lower competition levels and negatively affecting the target's revenue. Hence, through their mathematical proofs that lead to these explanations, Marquez and Singh (2013) show that:

- a. When the number of bidders is exogenously determined and $\varphi = 0$, $\Delta R(N) > 0$ for all $N \geq 1$: target revenue is always lower with club formation.
- b. When the number of bidders is exogenously determined and $\varphi \in (0,1]$, $\Delta R(N) < 0$ if a club forms: the target is better off with club formation for all $N > \hat{N}(\varphi)$. $\hat{N}(\varphi)$ is a unique threshold value. Therefore, with low competition levels, such that $N < \hat{N}(\varphi)$, target revenue is negatively affected by club formation.
- c. When the number of bidders depends on free entry and $c > 0$, $\Delta R(N_{NC}N_{CB}, \varphi|c) > 0$ for all $\varphi \in [0,1]$: target revenue is lower with club formation. In equilibrium, when $N \rightarrow \infty$ and $c > 0$, club formation is always detrimental to target revenue.

These two scenarios of high and low competition levels, however, have so far assumed different levels of bidding costs. Marquez and Singh (2013) then further analyse the case in which bidding costs are present at a fixed value, so that $c = \hat{c}$, and the effect of club formation on target revenue. The authors successfully provide mathematical proof that club formation is beneficial for an intermediate level of competition N , given a fixed level of bidding costs \hat{c} . Therefore, even if competition levels are very low, if bidding costs are present so that $c > 0$ the same results of the case with low N and $c = 0$ apply: anticompetitive effects arising from

a very low number of participants is dominant over the possible value creating effects, therefore for when $\varphi \geq 0$. Summarising, independently of whether bidding costs are present or not, low competition levels are detrimental for the target. If competition levels are very high, bidding costs are an entry barrier which might exclude potentially value-adding acquirers, free entry determines prices and club formation might deter single acquirers from bidding, ultimately negatively affecting the target. Targets benefit the most from an intermediate level of competition.

Based on this line of deduction, it seems reasonable to argue that prominent PE firms, and therefore the consortia made out of these, face lower bidding costs than non-prominent PE firms as they have more resources to afford the high bidding costs c set in an auction than smaller PE firms. This falls in line with previous literature: larger deals tend to be pursued by larger firms, whether alone or in a consortium (Shivdasani & Wang, 2011). Based on this model, a bidding process with only prominent PE firms implies high bidding costs that set barriers to entry to other potential acquirers. In such a setting, competition is lower as only a few large (prominent) PE firms can afford c . With low competition levels, PE firms can benefit from lower prices through club formation. Assuming PE firms aim at profit maximisation (Marquez & Singh, 2013), I would expect large deals to indicate that few prominent PE firms entered the bidding process due to bidding costs and therefore to lead to a greater propensity of club formation. I therefore expect a positive relationship between bidding costs (deal size is used as proxy) and club formation. I expect consortia formed by prominent PE firms to receive a higher discount in the takeover premium as a result of lower levels of competition N and higher bidding costs c , measured by deal size. Finally, I expect the number of bidders to have a negative effect on the discount on the takeover premium obtained by PE consortia. Target returns are used as a measure of “target revenue”, while target value added is measured over a longer-term than target returns by testing Hypotheses 5 and 6. Building on these reasonings, three more hypotheses follow: Hypothesis 7 tests for the effect of bidding costs on target returns; Hypothesis 8 tests for the effect of deal size on the probability of club formation; Hypothesis 9 tests for the effect of the number of potential bidders on target returns, and therefore takeover premium.

Hypothesis 7: *The interaction between consortia formed by prominent PE firms and deal size has a positive relationship with the takeover premium discount.*

Hypothesis 8: *Large deals are positively correlated with club formation.*

Hypothesis 9: *A lower number of potential bidders negatively affects the discount on the takeover premium paid by PE consortia.*

Moreover, Boone and Mulherin (2011) investigate the effects of PE club deals on different measures of competition. In order to investigate possible comparisons and contrasts with their analysis, I also investigate the impact of PE consortia and related variables on competition levels. Specifically, on the number of firms that in the bidding process were contacted, that sent indications of interest, and that entered into confidentiality agreements. These measures of takeover competition levels are based on the research study of Boone and Mulherin (2011). Following the model by Marquez and Singh (2013), I expect PE consortia to have a negative effect on competition. My final hypothesis then follows:

Hypothesis 10: *Club deals have a negative effect on competition levels in bidding processes*

Building on previous literature, I expect PE club deals to be value adding to targets and therefore to increase post-buyout target performance (Scellato & Ughetto, 2013; Jensen, 1989; Guo et al.; Marquez & Singh, 2013; Wilson, Wright & Siegel, 2012; Song, 2004). However, based on the model by Marquez and Singh (2013), the positive effect of consortia might also be conditional on the setting of the bidding process, therefore the number of potential bidders that participate and the magnitude of bidding costs. By testing their theoretical and mathematical model, I expect prominent PE firms to have a discount in the takeover premium when there is a more favourable setting of the bidding process, such as a low number of potential bidders and high bidding costs. I also expect club deals to have a negative impact on competition levels. If these hypotheses are confirmed, they might raise questions of whether some collusive behaviour took place or the PE firms acted in *bona fide*.

3. Sample Construction

In this Section, the data collection and the sample selection for the empirical analysis are described. Data of M&A transactions is obtained from the Thomson Financial Securities Data Company (SDC) database, while information about financials and security prices is obtained from the Center for Research in Security Prices (CRSP) and Compustat databases available at Wharton Research Data Service (WRDS). In order to obtain data about the potential number of bidders and the general bidding process, I manually search and read each target-related merger filings on the Securities and Exchange Commission (SEC) merger filings database EDGAR. A more detailed description of this process can be found in Section 4. Transactions are filtered on time period, deal status, acquirer and target nation, acquirer status, target status, deal value and payment method. I therefore consider completed deals from January 1984, year of the first LBO wave and following Officer et al. (2010), until the end of December 2019. The acquirer can be either public or private, while the target can have a status of private, public or subsidiary. Even though PE firms are by definition private, I select also public acquirers in order to be able to make a comparison between deals by PE firms and M&As by public firms. Moreover, there exist public investment firms that conduct private equity investments and sometimes investor groups or management-led LBOs that are flagged by SDC as “public acquirers” depending on the participants. I apply the following criteria to the sample:

- Both acquirer and target have to be from the U.S.
- Payment method can be either only cash, stock or a combination of the two.
- The deal value has to be of at least \$100 million.
- The acquirer is seeking to own at least 50% of the total target’s shares post-transaction.

Based on the idea that bigger players have a bigger impact, I focus my empirical analysis on prominent PE firms. Prominent firms have a greater chance to sufficiently affect competition levels, while smaller players are not large enough to have a significant impact and therefore should not be included (Officer et al., 2010; Marquez & Singh, 2013). Prominent firms are defined as the top 50 firms in the 2019 ranking edition of the *Private Equity International (PEI)* magazine for the years 2008-2019, while for the years 1984-2007 I use the list of prominent PE firms uses by Officer et al. (2010), which was also obtained from the PEI magazine but from the 2007 edition. Moreover, still following Officer et al. (2010), the investment banks with PE units Bank of America Merrill Lynch, Morgan Stanley, JP Morgan with Chase Capital Partners, as well as Forstman Little and HM Capital Partners are also included in the sample. In order to determine whether deals are made by PE consortia or a

single PE firm, I manually perform a text search in the transaction synopses provided by SDC. Even though SDC provides both “LBO” and “PE firm” flags, I decided to follow this method in selecting PE firms and LBO transactions due to the proven inaccuracy and subsequent unreliability of these flags in previous academic research (Officer et al., 2010). In fact, Officer et al. (2010) discover through a manual proof check that SDC would miss one in five LBO transactions in their sample, as well as capturing transactions that are not directly sponsored by PE firms, but for instance by corporation-led buyouts or management buyouts without the involvement of a PE firm. Nevertheless, given that there is no list of non-prominent PE firms I decided to follow a mixed road to identify club and sole-sponsored deals by non-prominent PE firms. On the one hand, I search for the acquirer business descriptions that are the same as for the deals made by prominent PE firms, which is the first sub-sample I identify (e.g. “Investor Group”, “Acquisition Vehicle Company”, “Special Purpose Acquisition Vehicle”, “PE Firm”). On the other hand, I text search for the PE firms that were categorised as prominent in the Officer et al. (2010) list as well as for those ranked 51st up to 100th in the PEI magazine 2020 edition. I was unable to use the 2019 edition as by the time I wanted to collect this information the list on the PEI magazine was already updated to the year 2020. Additionally, if while conducting this text search I encounter a new PE firm, I then include it as well in the sample. The lists of PE firms from the PEI magazine that are used in this research study can be found in Appendix B.

I segment my overall sample into the following sub-samples: PE Club Deals, which includes deals made by a consortium of prominent PE firms; Sole PE, which includes sole-sponsored deals made by prominent PE firms; Other Private, which includes transactions performed by private acquirers other than prominent PE firms; Other Public, which includes transactions performed by public acquirers other than prominent PE firms; PE Firm, which includes deals made by non-prominent PE firms. Finally, I also create a sub-sample named NClub that includes club deals made by non-prominent PE firms. I collect information regarding club deals by non-prominent PE firms in order to test Hypothesis 9, while I collect information regarding sole-sponsored deals by non-prominent PE firms primarily in order to compare it with the NClub sub-sample, in order to have a full overview of their distribution. In Table 1, for clarity’s sake the sub-samples Other Private, Other Public and NClub are reported in the Other Deals section under the names “Private Bidder”, “Public Bidder” and “Club Deals”, respectively. When it comes to company identifiers, I use TICKERS due to their adaptability across databases, which allows me to check for daily return data on CRSP after collecting data from SDC. SDC provides only 6-digit CUSIPS which are not convertible to 8-

digit or 9-digit CUSIPS that would be necessary for searching data on CRSP. I use CUSIPS only when collecting financials data from CRSP/Compustat, given that otherwise the sample size would be limited and that I perform this step after having already collected data about daily securities prices from CRSP, allowing me to obtain 8-digit CUSIPS for the respective TICKERS. Afterwards, I convert² them to 9-digit CUSIPS in order to obtain data from CRSP/Compustat.

Applying the selection criteria described above, I extract 16,530 transactions from SDC, from 1984 to 2019. Filtering by targets with an available ticker identifier reduces then the final sample to 5,052 transactions, of which 77 are club deals made by prominent PE firms, 193 are sole-sponsored deals by prominent PE firms, 223 are deals made by single non-prominent PE firms, and 29 are club deals by non-prominent PE firms. The overall sample distribution is presented in Table 1. From Table 1 it is already possible to notice the LBO and M&A waves defined by the Dot-com bubble and the financial crisis of 2008. From 1984 until the 1990s there is an increase in the number of deals, which is possible to notice particularly in the samples All Deals, Club Deals by prominent PE firms, Sole PE, and Club Deals by non-prominent PE firms. Then, during the 1990s until the end of the 20th century there is little M&A and LBO activity, as in line with previous literature (Kaplan & Strömberg, 2009), and around the years 1999-2001 it is possible to observe the Dot-com bubble effect and its burst across all samples through a sharp decline in the number of transactions carried out. The same effect is noticeable around 2007-2009 as the figures reveal the negative impact of the global financial crisis of 2008 on both M&A and LBO activity. Moreover, in Table 1 is already possible to notice the differences in deal size across the different sub-samples by looking at the average deal value, and therefore size, (Avg.): club deals are much larger than sole-sponsored deals, independently of whether they are carried out by prominent PE firms or not. The difference is quite relevant and it holds even for club deals by non-prominent PE firms, which is a relatively small sample compared to the sole-sponsored deals carried out by non-prominent PE firms, specifically 29 versus 223 transactions with an average deal size for the Club Deals sample under the Other Deals sample that is nearly three times greater than the one for the PE Firm sample.

² with the aid of the CUSIP-converting tool on WRDS.

Table 1. Sample distribution.

In this table, I report the total number of deals and total deal value per year for the whole sample as well as for subsamples. Transactions data is analysed from 1984 until 2019 and is obtained from the Thomson Financial Securities Data Company (SDC) database. The selection criteria are: the acquirer can be either public or private; the target can be private, public or subsidiary; the acquirer must be seeking to own at least 50% of the target's shares; the deal must be of at least \$100 million; both the acquirer and the target are U.S.-based. Prominent Private Equity (PE) firms are defined as those in the Top 50 in the 2019 ranking edition of the *Private Equity International (PEI)* magazine: *Club Deals* includes PE Club Deals and *Sole PE* indicates sole-sponsored LBOs. *Other Deals* includes all deals that were not made by prominent PE firms. *Private Bidder* and *Public Bidder* indicate LBOs made by non-prominent PE firms and M&A deals with private and public bidders, respectively. *PE firm* indicates PE deals made by single non-prominent PE firms. *Club Deals* under *Other Deals* indicates club deals made by non-prominent PE firms.

Year	All Deals		Deals by Prominent PE firms						Other Deals					
	N. deals	Total Deal Value (\$Mil)	Club Deals		Sole Deals		Private Bidder		Public Bidder		PE Firm		Club Deals	
			N. deals	Total Deal Value (\$Mil)	N. deals	Total Deal Value (\$Mil)	N. deals	Total Deal Value (\$Mil)	N. deals	Total Deal Value (\$Mil)	N. deals	Total Deal Value (\$Mil)	N. deals	Total Deal Value (\$Mil)
2019	86	473,007	0	0	3	5,277	12	10,959	71	456,771	9	10,092	0	0
2018	143	490,763	2	7,938	6	15,844	17	27,170	118	439,811	7	5,864	1	2,551
2017	119	403,020	0	0	8	8,469	16	20,285	95	374,266	9	8,890	0	0
2016	150	426,627	2	4,505	14	29,606	24	27,108	110	365,408	11	2,665	0	0
2015	137	599,833	2	7,290	1	1,033	18	19,590	116	571,920	10	12,819	0	0
2014	130	474,020	2	11,748	6	13,701	18	33,359	104	415,213	12	4,605	0	0
2013	124	257,032	1	6,710	10	32,493	26	53,388	87	164,442	9	4,729	1	28,000
2012	103	142,849	2	1,060	6	3,785	15	9,807	80	128,197	5	2,513	1	1,322
2011	80	267,209	3	5,659	4	6,403	15	9,651	58	245,496	8	3,513	0	0
2010	124	160,846	3	11,474	5	4,625	26	14,590	90	130,158	11	9,942	1	103
2009	93	322,084	1	900	6	5,808	14	9,194	72	306,182	4	963	0	0
2008	92	253,461	0	0	4	4,262	20	64,200	68	184,999	10	1,418	1	485
2007	190	401,182	10	79,824	17	93,450	26	29,416	138	198,878	11	6,482	1	611

2006	201	650,416	16	177,471	9	75,007	39	33,706	137	364,231	16	12,322	2	1,122
2005	169	479,254	8	27,556	5	7,220	28	34,989	128	409,490	9	4,881	2	464
2004	159	314,198	4	12,058	5	62,545	25	25,132	124	213,747	6	1,781	1	155
2003	153	207,389	1	1,082	5	4,020	26	25,516	121	176,772	9	2,916	1	103
2002	114	130,860	1	100	4	3,054	22	11,257	87	116,449	9	3,095	1	115
2001	170	288,586	0	0	1	256	14	8,949	155	279,381	2	1,010	1	179
2000	293	855,316	3	1,111	1	121	33	59,030	256	795,054	5	1,827	5	3,195
1999	337	719,917	5	2,080	9	8,269	30	19,176	293	690,393	17	6,102	0	0
1998	322	855,742	4	3,542	4	1,404	28	11,414	286	839,382	5	1,235	2	490
1997	320	354,077	2	1,472	10	6,419	18	4,631	290	341,555	4	787	2	610
1996	205	263,026	1	113	4	2,250	12	14,315	188	246,349	1	227	2	898
1995	165	161,808	1	1,121	2	3,597	7	2,746	155	154,344	0	0	0	0
1994	124	82,937	0	0	1	229	8	3,998	115	78,710	1	349	0	0
1993	86	81,468	0	0	2	342	6	4,452	78	76,674	1	350	0	0
1992	67	29,061	0	0	0	0	7	2,576	60	26,485	1	158	1	158
1991	48	32,021	0	0	0	0	2	593	46	31,428	0	0	0	0
1990	36	28,023	0	0	3	2,233	3	717	30	25,074	1	263	0	0
1989	86	84,794	1	1,573	5	1,931	22	15,439	58	65,851	5	3,291	1	650
1988	107	96,504	0	0	11	38,462	41	22,488	55	35,554	9	3,714	0	0
1987	101	61,122	0	0	8	8,714	24	15,819	69	36,589	2	981	1	279
1986	103	55,263	1	1,250	10	9,864	15	5,847	77	38,302	2	308	1	752
1985	95	85,314	1	637	3	6,074	13	7,214	78	71,389	2	683	0	0
1984	20	9,450	0	0	1	734	7	1,794	12	6,922	0	0	0	0
Total	5,052	10,598,481	77	368,273	193	467,500	677	660,513	4,105	9,101,866	223	120,775	29	42,241
Avg.		2,098		4,783		2,422		976		2,217		542		1,457

4. Methodology

In this section I explain the methodology used for the empirical analysis to test each one of the hypotheses presented in Section 2. To test the effects of variables on target returns, I apply the event study methodology. This type of methodology was originally constructed by Fama, Fisher, Jensen and Roll (1969) and it allows to observe deal pricing effects in relation to the target returns and therefore to analyse the effects on takeover premium. This methodology is widely academically recognised and it now used as a standard method for analysing how a variable is affected by a related event or announcement, specifically it is very popular for testing security price reaction (Binder, 1998; Boehmer, Musumeci & Poulsen, 1991). Both papers by Officer et al. (2010) and Boone and Mulherin (2011), which are two relevant academic research studies in collusion motives and PE club deals, follow the event study methodology. Therefore, I analyse how target returns are affected by and the changes around the date of deal announcement. Specifically, I look at the following target returns: raw returns, cumulative abnormal returns (CARs), and buy-and-hold abnormal returns (BHARs). I then analyse also three more periods of trading days for each type of return, following the intervals choice of Schwert (1996) and Officer et al. (2010): a markup period (0, 126), a runup period (-42, -1), and a premium period (-42, 126). Both CARs and BHARs are based on abnormal returns (ARs), which are computed as the difference between the target's return r of firm i on day t and the expected return based on past performance, namely $E(r_{it})$:

$$AR_{it} = r_{it} - E(r_{it}) \quad (1)$$

The expected return for each target firm's return are then computed using a market-model that comprises the target's return (r_{it}) as well as the market return with the associated idiosyncratic risk ($\beta_i * r_{mrkt}$):

$$r_{it} = \alpha_i + \beta_i * r_{mrkt} + \varepsilon_{it} \quad E(\varepsilon_{it} = 0) \quad (2)$$

In order to estimate the parameters α_i and β_i of the market model in equation (2), I follow Schwert (1996), Bargaron et al. (2008) and Officer et al. (2010) and set an estimation window for previous performance of 252 trading days, from day -379 to -127, where day 0 is the day of deal announcement. I then use as a benchmark for calculating $E(r_{it})$ the CRSP value-

weighted index on day t (r_{mrkt}), including dividend distributions. CARs are then computed over the event window $(-1, 1)$, considering only trading days. This event window of three days around announcement date has been widely used in previous M&A academic research studies (e.g. Schwert, 1996; Bargeron et al., 2008; Officer et al. 2010; Golubov, Yawson & Zhang, 2015). CARs are computed as the sum of ARs around the announcement date on date t :

$$CARs = AR_{t-1} + AR_t + AR_{t+1} \quad (3)$$

Putting together equation (2) with equation (3), CARs result as the sum of market-model residuals ε_{it} , based on the market-model parameters α_i and β_i , the benchmark CRSP value-weighted index r_{mrkt} with estimation window $(-379, -127)$, and each target firm's returns with event window $(-1, 1)$:

$$\sum_{t-1}^{t+1} \varepsilon_{it} = r_{it} - (\alpha_i + \beta_i * r_{mrkt}) \quad (4)$$

In a similar way to how ARs are calculated in equation (1), BHARs are computed as the difference between the compound return to the target shares and the compound return to the benchmark CRSP value-weighted market index, including dividend distributions.

4.1 Model Specifications and Data

In this sub-section I explain the econometric models used and their application to this study's data for each hypothesis constructed in Section 2. Following the event study methodology and previous M&A literature, I compare raw returns, CARs and BHARs over the runup, markup and premium period and across the subsamples Club, Sole PE, Other Private, Other Public, PE Firm, and NClub which are defined in Section 3. CARs are also analysed over the event window $(-1, 1)$. After this manual computation of the differences in returns across groups, I run a multivariate regression analysis with a Fixed Effects (FE) model on target returns in order to understand the magnitude and significance of the effect of PE club deals as well as other control variables. To test the role played by deal value in club formation I perform a multivariate analysis with a probit model. To test effects on target profitability, target growth and competition levels in the bidding process, I conduct multivariate analyses with FE regression models. Building on previous M&A and PE literature (e.g. Officer et al., 2010; Boone & Mulherin, 2011; Bargeron et al., 2008) as control variables I use deal characteristics,

target characteristics, time indicators (e.g. Pre-2006, Post-2014), and bidding process-related variables.

A multivariate regression is an OLS regression with multiple control variables (Stock & Watson, 2015). OLS is a linear regression: its aim is to analyse the linear effect of the change in a variable X on another variable Y (Stock & Watson, 2015; Angrist & Pischke, 2008). As explained by Stock & Watson (2015), this relationship is then defined by the coefficient β either as in equation (5) or (6):

$$\beta = \frac{\text{Change in } Y}{\text{Change in } X} = \frac{\Delta Y}{\Delta X} \quad (5)$$

The linear relationship between X and Y can then be defined with an OLS regression model that incorporates their effect for each entity i :

$$Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i \quad (6)$$

In this regression model β_0 is the intercept, while β_1 is the slope and it represents the effect of a one-unit change in X on Y . The error term ε is often unrelated to X and incorporates all other factors that might influence the relationship between X and Y . Building on this basic regression model that is OLS, a multivariate regression analysis includes multiple n variables and corresponding n β coefficients:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \dots + \beta_n X_{ni} + \varepsilon_i \quad (7)$$

In the multivariate regressions I use to test hypotheses, I also apply a FE model by controlling for industry and year fixed effects. A FE model is used in order to control for possible heterogeneity across entities (i.e. acquirer firms), settings (i.e. industry) and time (i.e. year) that may bias the regression output (Stock & Watson, 2015). This model allows to hold constant unobserved characteristics Z of entities and time for each observation i :

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 Z_i + \varepsilon_i \quad (8)$$

When the FE model includes multiple variables:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \dots + \beta_n X_{ni} + \beta_{n+1} Z_i + \varepsilon_i \quad (9)$$

In order to provide accurate results, OLS must satisfy five conditions, also known as the five Gauss-Markov assumptions (Stock & Watson, 2015):

- a. Linearity of parameters
- b. Random sample from population
- c. Non-collinearity among regressors
- d. Exogeneity, uncorrelation between regressors and error term
- e. Homoscedasticity of standard error variance

The regressions used in this study are based on the papers of Officer et al. (2010) and Boone and Mulherin (2011): I expect their regressors to fulfil conditions (a) and (c). Even though the model by Marquez and Singh (2013) analyses a nonmonotonic relationship between the number of potential bidders and the effect on target revenue, I only test for one side of the model when competition levels are low and negatively impact the target. I am therefore unable to state whether the opposite effect (i.e. very high competition levels on target returns) is in line or not with the authors' model. Moreover, when testing the three competition levels on target returns, I include one variable at a time in order to avoid collinearity among regressors. The sample is randomly selected from SDC, following criteria based on previous literature, which are described in Section 3 (Officer et al., 2010; Boone & Mulherin, 2011; Golubov et al., 2015; Barger et al., 2008). In order to control for exogeneity I apply year and industry FE, as in Officer et al. (2010). In order to be able to interpret the time indicator variables' coefficients (i.e. pre-2006 and post-2014 periods), year FE are applied only when no time indicator variables are included. For the same reason, given that I include sample indicator variables in all of the regressions, I do not include firm FE. In order to meet the last assumption (e), standard errors are adjusted for heteroscedasticity in STATA.

I test target returns-related hypotheses (Hypothesis 1 and 2) by looking at how bidder type, deal characteristics, target characteristics and time indicators affect target returns through a multivariate analysis and a FE model. Hypothesis 3 is tested by looking at average deal size across sub-samples. In order to test Hypothesis 4, I also include target institutional ownership alone as well as combined with the variable Club. Hypotheses 5 and 6 are tested through a FE model as in equation (9) that has as a dependent variable (DV) the target's profitability and growth. In order to measure target profitability, I use the ratio EBITDA/Assets as it provides information about how efficiently firms use of their assets compared to their earnings (Scellato

& Ughetto, 2013). Following Scellato & Ughetto (2013), I then use the natural logarithm of assets and the number of employees as proxies for growth:

$$Profitability = \frac{EBITDA}{Assets} \quad (10)$$

$$Growth_a = \ln(Total\ Assets) \quad (11)$$

$$Growth_b = \ln(Employees) \quad (12)$$

Information regarding target EBITDA, total assets and number of employees is retrieved from CRSP and Compustat on WRDS. For all the three equations presented above, data is collected over four years from t_{-1} up to and including t_{+2} , where t_0 is the year in which the date of deal announcement falls (Scellato & Ughetto, 2013).

Hypotheses 7 and 9 are tested with another FE model that has as a DV the takeover premium as measured by CARs and BHARs, while Hypothesis 8 is tested with a Linear Probability model as the DV is not continuous but binary, with values whose bounds are zero and one (Stock & Watson, 2015). It is called a “probability” model because the regression function corresponds to the probability that, given X , the DV is equal to one, and it is applied through either the probit or logit nonlinear regression (Stock & Watson, 2015). Following econometric theory and the paper by Boone and Mulherin (2011), I use a probit regression to analyse the effect of deal size on club formation, represented by a dummy that equals one if the deal is a club deal and zero otherwise. As explained by Stock and Watson (2015), the probit model with multiple regressors therefore has a dependent binary variable Y and it depends on the cumulative standard distribution function Φ of the regressors X_n with their corresponding β_n coefficients:

$$P(Y = 1 | X_1, X_2, \dots, X_n) = \Phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 \dots + \beta_n X_n) \quad (13)$$

The probability that Y equals one depends on the z-distribution and therefore it can be estimated by calculating the $z = (\beta_0 + \beta_1 X_1 + \beta_2 X_2 \dots + \beta_n X_n)$, given the values $X_1, X_2 \dots X_n$. The β_1 coefficient represents the change in this z-value based on a one-unit change in X_1 and by keeping the other regressors constant (Stock & Watson, 2015). Sample indicators are dummy variables for the sub-samples Club, NClub, SolePE, and PEFirm as they are explained in

Section 3. I also include the dummy variable Other Private which equals one if the bidder is private and zero if it is public, excluding deals by prominent PE firms. A detailed description of each variable can be found in Appendix C. For what concerns target characteristics, I include the following variables: Size, Tobin's Q, EBITDA/Assets, Leverage, Institutional Ownership, Prior 12-month BHAR, and Prior 12-month Volatility. For what instead concerns deal characteristics, I include deal value, a dummy variable for tender offer, a dummy variable Diversify for whether target and acquirer are in the same industry (based on SIC-codes), a dummy Hostile for whether the acquisition was hostile or not, a dummy Defensive for defensive strategies, a dummy Payment Method for whether the payment method is only cash or a mix of stock and cash, and a variable Days for the number of calendar days between announcement and execution date. For each of these variables, data is obtained from CRSP, Compustat and SDC. Information about target institutional ownership is retrieved from the Thomson Financials 13F Holdings database for the year of deal announcement. Institutional ownership is then calculated as it follows:

$$\text{Institutional Ownership} = \frac{\text{Shares Held by Institutions}}{\text{Firm's Total Shares Outstanding}} \quad (14)$$

In order to test Hypothesis 2 and 9, I include some extra variables for each analysis: Pre-2006 and Post-2014 for Hypothesis 2, which identify the period prior to the DoJ inquiry in 2006 and post the settlement by the PE firms in 2014; and bidding characteristics variables such as Indication of Interest for Hypothesis 9, which indicates the number of potential bidders in the bidding process for each transaction, measured as the number of indications of interest sent. Information regarding the number of bidders in the bidding process is obtained from the SEC website. Specifically, I hand search each target that was taken over by a consortium of PE firms on the SEC merger filings' platform EDGAR, which contains publicly available information about mergers, acquisitions and tender offer transactions. I retrieve information regarding the potential number of bidders involved in the bidding process through the reading of the sections "Background of the Merger", "Background of the Offer" and "Background of the Transaction", depending on the type of transaction. I perform this data collection also with the aid of keywords, which are reported in Table D.2 of Appendix D. Different transactions involve different SEC forms and normally these sections can be found in the filings named DEFM14A and S-4 for mergers, and SC 149D for tender offers. Nevertheless, this is not always the case as information can also be stored in forms that are variations of the ones just

mentioned, such as DEF 14A, PRE 14A, PREM14A, DEF 14C, DEFS14A, PRES14A, DEFM14C, and SC 149D/A. When none of these types of forms of variations of the which were available on the SEC's page of the target, I search on the SEC's page of the acquirer. However, for some of the oldest deals from the 1980s in the sample no information is found either on the acquirer or the target's SEC page.

Through the reading of the SEC merger filings I also collect data regarding how many firms the target made contact with (Contact), whether the deal was target initiated (Target Initiated), how many firms signed a confidentiality agreement (Confidentiality) and whether there was a go-shop period or not (GoShop). A detailed description of each variable can be found in Appendix C. Building up on econometric theory from the models presented, I therefore test the first, second and fourth hypothesis with the following FE models.

Hypotheses 1 and 2:

$$\begin{aligned}
 Y_i = & \beta_0 + \beta_1 Club + \beta_2 NClub + \beta_3 PE Firm + \beta_4 Other Private + \beta_5 Tender \quad (15) \\
 & + \beta_6 Hostile + \beta_7 Diversify + \beta_8 Defence + \beta_9 Days \\
 & + \beta_{10} Deal Value + \beta_{11} Pre - 2006 + \beta_{12} Pre2006 * Club \\
 & + \beta_{13} Pre - 2006 * SolePE + \beta_{14} Post - 2014 + \beta_{15} Post \\
 & - 2014 * Club + \beta_{16} Post - 2104 * SolePE \\
 & + Industry Fixed Effects + \varepsilon_i
 \end{aligned}$$

Hypotheses 1 and 4:

$$\begin{aligned}
 Y_i = & \beta_0 + \beta_1 Club + \beta_2 NClub + \beta_3 PE Firm + \beta_4 Other Private \quad (16) \\
 & + \beta_5 Tender + \beta_6 Hostile + \beta_7 Diversify + \beta_8 Defence \\
 & + \beta_9 Days + \beta_{10} Deal Value + \beta_{11} Pre - 2006 \\
 & + \beta_{12} Pre2006 * Club + \beta_{13} Pre - 2006 * SolePE \\
 & + \beta_{14} Post - 2014 + \beta_{15} Post - 2014 * Club + \beta_{16} Post \\
 & - 2104 * SolePE + \beta_{17} Size + \beta_{18} Tobin's Q \\
 & + \beta_{19} Leverage + \beta_{20} \frac{EBITDA}{Assets} \\
 & + \beta_{21} Institutional Ownership \\
 & + \beta_{22} Institutional Ownership * Club \\
 & + \beta_{23} Institutional Ownership * SolePE + \beta_{24} Prior 12 \\
 & - month BHAR + \beta_{25} Prior 12 - month Volatility \\
 & + \beta_{26} All Cash + Industry Fixed Effects + \varepsilon_i
 \end{aligned}$$

Where Y_i represents the DVs:

- Markup BHAR
- Markup CAR
- BHAR
- CAR
- Premium BHAR
- Premium CAR

All the equations presented in this Section are a general overview as I also conduct analyses based on only deal characteristics or target characteristics and therefore apply some variations. Equation (15) tests Hypotheses 1 and 2 through the inclusion of the interaction effects $\beta_{12}Club * Pre - 2006$, $\beta_{15}Club * Post - 2014$, $\beta_{13}Sole * Pre - 2006$, and $\beta_{16}Sole * Post - 2014$, while equation (16) tests Hypotheses 1, 2 and 3. These interaction effects specifically analyse whether the pre-2006 and post-2014 periods are relevant in determining takeover premia for club deals by prominent PE firms, compared to sole-sponsored LBOs. I also run a robustness check for hypotheses 1, 2, and 3 by running regressions (15) and (16) but over the specific sample of prominent PE firms, including both club and sole-sponsored deals for a total of 270 transactions. For ease of comparison reasons with the robustness check carried out by Officer et al. (2010), I do not include target fundamentals in these regressions. Hypotheses 5 and 6 are tested with the following regressions:

Hypothesis 5:

$$\begin{aligned}
 Profitability = & \beta_0 + \beta_1 Club + \beta_2 NClub + \beta_3 PEFirm + \beta_4 Other Private & (17) \\
 & + \beta_5 Tender + \beta_6 Hostile + \beta_7 Diversify + \beta_8 Defence \\
 & + \beta_9 Days + \beta_{10} Deal Value + \beta_{11} All Cash + \beta_{12} Pre - 2006 \\
 & + \beta_{13} Pre2006 * Club + \beta_{14} Pre - 2006 * SolePE + \beta_{15} Post \\
 & - 2014 + \beta_{16} Post - 2014 * Club + \beta_{17} Post - 2104 \\
 & * SolePE + Industry Fixed Effects + \varepsilon_i
 \end{aligned}$$

Hypothesis 6:

$$\begin{aligned}
 Growth_a = & \beta_0 + \beta_1 Club + \beta_2 NClub + \beta_3 PEFirm + \beta_4 Other Private & (18) \\
 & + \beta_5 Tender + \beta_6 Hostile + \beta_7 Diversify + \beta_8 Defence \\
 & + \beta_9 Days + \beta_{10} Deal Value + \beta_{11} All Cash + \beta_{12} Pre - 2006 \\
 & + \beta_{13} Pre2006 * Club + \beta_{14} Pre - 2006 * SolePE + \beta_{15} Post \\
 & - 2014 + \beta_{16} Post - 2014 * Club + \beta_{17} Post - 2104 \\
 & * SolePE + Industry Fixed Effects + \varepsilon_i
 \end{aligned}$$

$$\begin{aligned}
 Growth_b = & \beta_0 + \beta_1 Club + \beta_2 NClub + \beta_3 PEFirm + \beta_4 Other Private & (19) \\
 & + \beta_5 Tender + \beta_6 Hostile + \beta_7 Diversify + \beta_8 Defence \\
 & + \beta_9 Days + \beta_{10} Deal Value + \beta_{11} All Cash + \beta_{12} Pre - 2006 \\
 & + \beta_{13} Pre2006 * Club + \beta_{14} Pre - 2006 * SolePE + \beta_{15} Post \\
 & - 2014 + \beta_{16} Post - 2014 * Club + \beta_{17} Post - 2104 \\
 & * SolePE + Industry Fixed Effects + \varepsilon_i
 \end{aligned}$$

The DVs for equations (17), (18) and (19) are defined by the previous equations (10), (11), and (12). Control variables are the same as for the regression equations (15). I also run a regression including fundamentals as in equation (16), excluding however variables that are in contrast with the DVs, such as EBITDA/Assets. Hypotheses 7, 8 and 9 are tested based on equations (9) and (13) with the following regressions.

Hypothesis 7:

$$\begin{aligned}
 Y_i = & \beta_0 + \beta_1 Club + \beta_2 Deal Value * Club + \beta_3 Deal Value * NClub & (20) \\
 & + \beta_4 Diversify + \beta_5 Days + \beta_6 All Cash + \beta_7 Size \\
 & + \beta_8 Institutional Ownrship + \beta_9 Institutional Ownrship \\
 & * Club + \beta_{10} Prior 12 - month BHAR + \beta_{11} Prior 12 \\
 & - month Volatility + \beta_{13} Pre - 2006 + \beta_{14} Post - 2014 \\
 & + Industry Fixed Effects + \varepsilon_i
 \end{aligned}$$

$$\begin{aligned}
Y_i = & \beta_0 + \beta_1 Club + \beta_2 Deal Value * Club + \beta_3 Deal Value * SolePE & (21) \\
& + \beta_4 Diversify + \beta_5 Days + \beta_6 All Cash + \beta_7 Size \\
& + \beta_8 Institutional Ownership + \beta_9 Institutional Ownership \\
& * Club + \beta_{10} Prior 12 - month BHAR + \beta_{11} Prior 12 \\
& - month Volatility + \beta_{13} Pre - 2006 + \beta_{14} Post - 2014 \\
& + Industry Fixed Effects + \varepsilon_i
\end{aligned}$$

Hypothesis 8:

$$\begin{aligned}
P(Club = 1) = & \Phi(\beta_0 + \beta_1 Deal Value + \beta_2 Tender + \beta_3 Diversify + \beta_4 Pre & (22) \\
& - 2006 + \beta_5 Post - 2014 + \beta_6 Size + \beta_7 All Cash)
\end{aligned}$$

$$\begin{aligned}
P(NClub = 1) & & (23) \\
= & \Phi(\beta_0 + \beta_1 Deal Value + \beta_2 Tender + \beta_3 Diversify + \beta_4 Pre \\
& - 2006 + \beta_5 Post - 2014 + \beta_6 Size + \beta_7 All Cash)
\end{aligned}$$

Hypothesis 9:

$$\begin{aligned}
Y_i = & \beta_0 + \beta_1 Club + \beta_2 Diversify + \beta_3 Days + \beta_4 Deal Value + \beta_5 All Cash & (24) \\
& + \beta_6 Size + \beta_7 Institutional Ownership + \beta_8 Prior 12 \\
& - month BHAR + \beta_9 Prior 12 - month Volatility + \beta_{10} Pre \\
& - 2006 + \beta_{11} Post - 2014 + \beta_{12} Indication of Interest \\
& + \beta_{13} Target Initiated + \beta_{14} GoShop \\
& + Industry Fixed Effects + \varepsilon_i
\end{aligned}$$

$$\begin{aligned}
Y_i = & \beta_0 + \beta_1 Club + \beta_2 Diversify + \beta_3 Days + \beta_4 Deal Value + \beta_5 All Cash & (25) \\
& + \beta_6 Size + \beta_7 Institutional Ownership + \beta_8 Prior 12 \\
& - month BHAR + \beta_9 Prior 12 - month Volatility + \beta_{10} Pre \\
& - 2006 + \beta_{11} Post - 2014 + \beta_{12} Target Initiated \\
& + \beta_{13} GoShop + \beta_{14} Contact + Industry Fixed Effects + \varepsilon_i
\end{aligned}$$

$$\begin{aligned}
Y_i = & \beta_0 + \beta_1 Club + \beta_2 Diversify + \beta_3 Days + \beta_4 Deal Value + \beta_5 All Cash & (26) \\
& + \beta_6 Size + \beta_7 Institutional Ownership + \beta_8 Prior 12 \\
& - month BHAR + \beta_9 Prior 12 - month Volatility + \beta_{10} Pre \\
& - 2006 + \beta_{11} Post - 2014 + \beta_{12} Target Initiated \\
& + \beta_{13} GoShop + \beta_{14} Confidentiality \\
& + Industry Fixed Effects + \varepsilon_i
\end{aligned}$$

Where Y_i represents the DVs:

- Markup BHAR
- Markup CAR
- BHAR
- CAR
- Premium BHAR
- Premium CAR

Each regression may be subject to variations in order to understand the impact of different variables. Finally, I test Hypothesis 10 with six different regressions: one for each one of the three measures of competition level and for both sub-samples Club and NClub. As introduced in Section 2, the measures of takeover competition chosen are based on the research study conducted by Boone and Mulherin (2011): Contact, which indicates the number of firms the target has been in contact with during the bidding process; Confidentiality, which indicates the number of parties the target entered into a confidentiality agreement with; and Indication of Interest, which indicates the number of firms that sent an indication of interest. The variable Indication of Interest is also used as a proxy for the number of potential bidders in order to test Hypothesis 9.

Hypothesis 10:

$$\begin{aligned}
& \textit{Indication of Interest} & (27) \\
& = \beta_0 + \beta_0 + \beta_1 Club + \beta_2 Deal Value + \beta_3 Size + \beta_4 All Cash \\
& + \beta_5 Pre - 2006 * Club + \beta_6 Post - 2014 * Club \\
& + Industry Fixed Effects
\end{aligned}$$

$$\begin{aligned}
\text{Contact} &= \beta_0 + \beta_0 + \beta_1 \text{Club} + \beta_2 \text{Deal Value} + \beta_3 \text{Size} + \beta_4 \text{All Cash} & (28) \\
&+ \beta_5 \text{Pre} - 2006 * \text{Club} + \beta_6 \text{Post} - 2014 * \text{Club} \\
&+ \text{Industry Fixed Effects}
\end{aligned}$$

$$\begin{aligned}
\text{Confidentiality} & & (29) \\
&= \beta_0 + \beta_1 \text{Club} + \beta_2 \text{Deal Value} + \beta_3 \text{Size} + \beta_4 \text{All Cash} \\
&+ \beta_5 \text{Pre} - 2006 * \text{Club} + \beta_6 \text{Post} - 2014 * \text{Club} \\
&+ \text{Industry Fixed Effects}
\end{aligned}$$

5. Results

In this Section, the results from the summary statistics and regression analyses used in order to test the ten hypotheses presented in Section 2 are reported in detail. Firstly, I report in Section 5.1 the results of a univariate analysis on target results over the overall sample and subsamples. Then, Section 5.2 reports the multivariate analyses on target returns across all different specifications in order to test the different hypotheses. Section 5.3 contains information regarding the results of a multivariate analysis on measures of target profitability and growth. Finally, Section 5.4 reports results from univariate and multivariate analyses related to the bidding process characteristics and takeover competition levels. All coefficients are interpreted *ceteris paribus*.

5.1 Univariate Analysis on Target Returns

I carry out a univariate analysis following the one by Officer et al. (2010), for ease of comparison reasons. In Table 2, I analyse the distribution of target returns across the full sample as well as across sub-samples. In Table 3, instead, I analyse the differences between target returns, as they are reported in Table 2, across the different sub-samples. I also test their statistical significance, for both the means and the medians.

In Table 2, it is possible to observe how the lowest returns are for the club deals samples (i.e. Club, NClub), across all types of returns. Specifically, Table 3 shows that Club returns are lower by between 3.07% and 9.27% than returns from the Sole PE sample, depending on the type of return observed. This is in line with the study by Officer et al. (2010) and it indicates that targets taken over by only one prominent PE firm can have greater returns by up to approximately 9%. This is also statistically significant at the 1% level. This result is also valid for the difference between target returns for the sub-sample Club and any other sub-sample, except for NClub. This result indicates that across all types of acquirers, targets taken over by PE consortia performed worse return-wise than any other target taken over instead by a public bidder, a private bidder, a prominent PE firm, or a non-prominent PE firm. This finding is also in line with the results by Officer et al. (2010). The greatest difference that PE consortium-backed targets face in their returns is with returns of targets acquired by non-prominent PE firms in sole-sponsored deals. Nevertheless, even though it may be the greatest difference with club deals of prominent PE firms returns, it exceeds the difference between Club and Sole PE only by a couple percentage points. Given that, due to the lack of available information regarding every year's ranked list from the PEI magazine, prominent PE firms were identified

Table 2. Target percentage returns.

In this table, means and medians (in brackets) of target raw returns (RETs), buy-and-hold abnormal returns (BHARs), and cumulative abnormal returns (CARs) are reported in percentage for the whole sample All Deals as well as for each subsample: Club, Sole PE, Other Private, Other Public, PE Firm, and NClub. Subsamples are defined in Section 3 as well as in Appendix C. Data is retrieved from SDC and CRSP on WRDS.

	All Deals	Club	Sole PE	Other Private	Other Public	PE Firm	NClub
Raw Returns (RETs)							
CAR3	6.76	3.34	6.41	6.32	6.89	7.14	5.45
	[1.08]	[0.4]	[0.79]	[0.73]	[1.16]	[0.7]	[0.98]
Runup RET	0.27	0.3	0.2	0.22	0.28	0.18	0.25
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Premium RET	0.3	0.14	0.29	0.26	0.31	0.31	0.13
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Markup RET	0.29	0.19	0.26	0.24	0.3	0.26	0.17
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Observations	4,257	73	161	484	3,539	146	20
Buy-and-Hold Abnormal Returns (BHARs)							
CAR3	20.3	9.9	19.16	18.74	20.78	21.25	16.17
	[16.23]	[9.18]	[16.43]	[14.63]	[16.68]	[17.65]	[12.45]
Runup BHAR	8.77	8.48	6.42	6.58	9.27	4.25	7.72
	[5.35]	[5.63]	[2.65]	[4.09]	[5.76]	[1.45]	[10.39]
Premium BHAR	21.94	6.23	17.64	17.81	23.03	20.7	6.55

	[18.11]	[5.35]	[16.25]	[14.42]	[19.14]	[15.52]	[8.2]
Markup BHAR	32.72	14.48	24.99	24.66	34.54	24.08	15.57
	[26.81]	[12.74]	[23.32]	[21.49]	[28.19]	[22.35]	[25.3]
Observations	4,257	73	161	484	3,539	146	20
Cumulative Abnormal Returns (CARs)							
CAR3	20.05	9.94	18.94	18.69	20.49	21.3	16.13
	[16.21]	[8.96]	[16.25]	[14.52]	[16.5]	[17.63]	[12.46]
Runup CAR	8.81	9.25	5.81	6.93	9.26	4.58	9.04
	[6.62]	[5.59]	[3.43]	[4.99]	[7.16]	[2.9]	[10.15]
Premium CAR	21.28	6.84	18.38	18.21	22.13	20.78	6.58
	[18.44]	[5.25]	[16.29]	[15.3]	[19.2]	[17.56]	[8.19]
Markup CAR	30.09	16.09	24.26	25.05	31.33	25.27	15.62
	[26.89]	[12.92]	[23.7]	[21.69]	[28.39]	[24.2]	[23.72]
Observations	4,257	73	161	484	3,539	146	20

Table 3. Cross-sectional differences between target returns.

In this table, mean and medians (in brackets) of target raw returns (RETs), buy-and-hold abnormal returns (BHARs), and cumulative abnormal returns (CARs) are reported in percentage for each subsample Club, Sole PE, Other Private, Other Public, PE Firm, and NClub. Subsamples are defined in Section 3 as well as in Appendix C. CAR3 indicates the event study with event window (-1, 1). Runup is the period with event window (-42, -1). Premium is the period with event window (0, 126). Markup is the period with event window (-42, 126). Estimation window is (-379, -127) for all periods. Data is retrieved from SDC and CRSP. Statistical significance is determined with a two-sample t-test for the means and a Wilcoxon test for the medians. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

	Club – Sole PE	Club – Other Private	Club – Other Public	Club – PE Firm	Club – NClub	Sole PE – Other Private	Sole PE – Other Public	Sole PE – PE Firm	Sole PE – NClub	Other Private – Other Public	PE Firm– NClub
Raw Returns (RETs)											
CAR3	-3.07***	-2.98**	-3.55***	-3.79***	-2.11	0.09	-0.48	-0.72	0.96	-0.57	1.68
	[-0.39]**	[-0.33]	[-0.76]**	[-0.30]	[-0.58]	[0.06]	[-0.37]	[-0.19]	[-0.19]	[-0.43]*	[-0.28]
Runup RET	0.09	0.08	0.02	0.12	0.05	-0.02	-0.07*	-0.04	-0.04	-0.06**	-0.07
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]*	[0.00]	[0.00]**	[0.00]	[0.00]***	[0.00]
Premium RET	-0.16***	-0.12**	-0.17***	-0.17***	0.01	0.04	-0.01	0.17	0.17*	-0.05**	0.18
	[0.00]	[0.00]	[0.00]**	[0.00]	[0.00]	[0.00]*	[0.00]	[0.00]	[0.00]	[0.00]***	[0.00]
Markup RET	-0.08*	-0.06	-0.11***	-0.07	0.02	0.02	-0.04	0.10	0.10	-0.05***	0.10
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]***	[0.00]	[0.00]**	[0.00]	[0.00]***	[0.00]
Buy-and-Hold Abnormal Returns (BHARs)											
CAR3	-9.27***	-8.85***	-10.88***	-11.35***	-6.278	0.42	-1.61	-2.08	2.99	-2.03*	5.07
	[-7.25]***	[-5.45]***	[-7.50]***	[-8.47]***	[-2.56]	[1.80]	[-0.25]	[-1.22]	[3.97]	[-2.05]**	[5.19]
Runup BHAR	2.06	1.90	-0.79	4.23	2.18	-0.16	-2.85	2.17	-1.30	-2.69**	-3.47
	[2.98]	[1.55]	[-0.13]	[4.19]**	[-0.49]	[-1.43]	[-3.11]	[1.21]	[-7.74]	[-1.67]***	[-8.94]
Premium BHAR	-11.42***	-11.58***	-16.8***	-14.47***	3.35	-0.16	-5.38**	-3.06	11.10*	-5.22***	14.15*
	[-10.9]***	[-9.07]***	[-13.79]***	[-10.17]***	[1.7]	[1.83]	[-2.89]	[0.73]	[8.05]	[-4.72]***	[7.32]

Markup BHAR	-10.51**	-10.18**	-20.07***	-9.60**	-5.67	0.32	-9.56**	0.91	9.42	-9.88***	8.51
	[-10.59]***	[-8.75]**	[-15.45]***	[-9.61]**	[-15.41]	[1.84]	[-4.87]**	[0.97]	[-1.98]	[-6.70]***	[-2.95]
Cumulative Abnormal Returns (CARs)											
CAR3	-9.00***	-8.75***	-10.56***	-11.36***	-6.19	0.25	-1.56	-2.36	2.81	-1.81	5.17
	[-7.29]***	[-5.56]***	[-7.54]***	[-8.67]***	[-3.5]	[1.73]	[-0.26]	[-1.38]	[3.79]	[-1.98]**	[5.17]
Runup CAR	3.44	2.32	-0.01	4.67	0.21	-1.11	-3.45**	1.24	-3.23	-2.33**	-4.46
	[2.16]	[0.60]	[-1.56]	[2.69]	[-4.56]	[-1.56]	[-3.72]*	[0.53]	[-6.72]	[-2.17]***	[-7.25]
Premium CAR	-11.54***	-11.37***	-15.30***	-13.94***	0.26	0.17	-3.76	-2.40	11.80**	-3.92***	14.20**
	[-11.04]***	[-10.05]***	[-13.95]***	[-12.31]***	[-2.94]	[0.99]	[-2.91]	[-1.27]	[8.10]	[-3.90]***	[9.37]
Markup CAR	-8.18**	-8.96*	-15.24***	-9.18**	0.47	-0.79	-7.07***	-1.01	8.65	-6.28***	9.65
	[-10.78]***	[-8.76]***	[-15.47]***	[-11.28]**	[-10.8]	[2.02]	[-4.69]***	[-0.50]	[-0.02]	[-6.71]***	[0.48]

with lists from the PEI 2019 and 2007 magazine editions, the sample might miss some data which may have been instead included in the non-prominent PE firms' samples (i.e. PE Firm and NClub). Those PE firms that, for instance, were prominent in 2010 or 1985 are not included either in the Sole PE or in the Club sub-samples. I am therefore rather cautious in comparing the samples of prominent PE firms with the ones of non-prominent PE firms.

The differences in returns between club deals and sole-sponsored deals by prominent PE firms can raise some scepticism: even though PE deals are on average priced lower than other deals, a statistically significant difference between sole-sponsored and club deals might be the indicator that other factors play a role in lowering even more the price for PE consortia (Officer et al., 2010). In line also with the results of the research study by Officer et al. (2010), Table 3 shows that for the runup periods the differences between target means and medians are for the vast majority statistically insignificant, which might suggest that deal anticipation or pre-announcement information leakage is indifferent across acquirer and deal types. Another important result is the highly statistically significant differences in returns between private and public bidders, sub-samples that include all but prominent PE firms. These differences are for the majority not as large as the ones between the Club sub-sample and the other sub-samples, except for the markup periods of BHAR and CAR. This result contrasts the one by Officer et al. (2010), who instead find target returns to be larger when the acquirer is a public rather than private bidder. Given that on average PE acquirers report lower target returns, a reason for this result might be that over time more non-prominent PE firms were created, categorised as "private bidders" in SDC. This finding is also an indicator that, in general, deals with private bidders are priced lower. In addition, Table 1 shows that deals pursued by non-prominent PE private bidders are on average smaller than those by non-prominent PE public bidders and they also complete deals less often. Overall, Table 2 and 3 provide evidence that private bidders and, in particular, prominent PE acquirers in club deals and sole-sponsored deals pay a statistically significant different (lower) takeover premium than public bidders.

5.2 Multivariate Analysis on Target Returns

After having carried out a univariate analysis on target returns, I run several regressions with a multivariate analysis in order to investigate returns' determinants and establishing whether there is a difference in prices between club and sole-sponsored deals. If there are statistically significant differences in takeover premia between PE acquirers, it might raise questions regarding possible collusion motives, as sustained in the study by Officer et al. (2010) and counter-argued by the study by Boone and Mulherin (2011). Tables 4 and 5 report the same

regressions but over target BHARs and target CARs, respectively. Given that runup periods are for the vast majority statistically insignificant in Table 3 and that their inherent noisy characteristic might make them inadequate as a measure of capturing significant differences across effects by club and sole-sponsored deals on target returns, the multivariate analysis is carried out only over the event window (-1,1) (i.e. CAR and BHAR, over CAR3 period) and the markup and premium periods (Officer et al., 2010).

In both Tables 4 and 5, regressions (a) and (b) include only deal characteristics, allowing an analysis on a much larger sample than when including target characteristics as in regressions (b) and (c). Table 4 shows that club deals by prominent PE firms are priced lower than sole-sponsored deals by prominent PE firms, in line with the findings by Officer et al. (2010). However, this effect is significant only over the shorter-terms target returns BHAR and Premium BHAR, while over the longer-term markup period the effect of Club is statistically insignificant. These result hold for both BHARs and CARs analyses (Tables 4 and 5). Therefore, the regression outputs indicate that prominent PE consortia pay indeed a lower takeover premium than single prominent PE firms. Specifically, consortia of prominent PE firms pay 24%³ less than single prominent PE firms. Other Private, which indicates deals with private acquirers that exclude prominent PE firms, also reports a small (6%) takeover premium discount over specification (b). A reason for this might be the exclusion of year FE.

The interaction terms between the pre-2006 and post-2014 periods and the indicator variables Club and SolePE are for the most statistically insignificant in both Tables 4 and 5. The only interaction term that is statistically significant is Post-2014 x Club over the premium period, with a positive effect on target returns. This result indicates that club deals by prominent PE firms did not obtain a discount in the years after 2014, which might provide evidence that the events of 2014 might have played a role in deterring club formation and therefore possible collusive behaviour. Deal value and paying all-cash also affect target returns, even if mainly over the short term: they respectively decrease and increase BHAR and CAR. These results are in line with the ones by Officer et al. (2010): all-cash payments increase the takeover premium over the short term, while larger deals decrease it (even if the magnitude is small).

Institutional ownership has a negative and significant effect on both CAR and BHAR when in interaction with Club: institutional ownership does not mitigate in these regressions the effect of club deals on takeover premium over the short term. This result is in contrast with

³ Computed as the average of the statistically significant coefficients in both Tables 4 and 5 (min = 10.6%; max = 43.8%). All further average effects of variables on DVs are interpreted by looking at the average of the respective statistically significant coefficients.

the findings of Officer et al. (2010) and it might be a possible signal of an inner circle of PE investors and institutions where competition levels are low, given the low number of participants. Even if statistically insignificant, Boone and Mulherin (2011) find also that institutional ownership combined with a consortium indicator variable negatively impacts target returns. A difference between their research study and this one is that in this one institutional ownership is combined with an indicator variable for club deals by prominent PE firms, while the consortium indicator variable that Boone and Mulherin (2011) use includes club deals by both prominent and non-prominent PE firms. I am rather cautious in interpreting the coefficients for institutional ownership, as a reason for this negative effect of institutional ownership interacting with Club might be the sample size in specifications (c) and (d), which is reduced drastically due to missing data. Institutional ownership alone has a statistically insignificant effect on target returns. Finally, tender offers result to have a positive effect on target returns in specifications (a) and (b); hostile takeovers are surprisingly increasing target returns in specifications (b) over the shorter-terms BHAR and CAR and premium periods.

Table 4. Multivariate analysis for target returns: BHAR, Markup BHAR and Premium BHAR.

In this table, multivariate regressions explaining the effect of the different variables on the target returns BHAR, Markup BHAR and Premium BHAR are reported. BHAR is the buy-and-hold abnormal return over the event window (-1, 1); Markup BHAR is the buy-and-hold abnormal return over the event window (-42, 126); Premium BHAR is the buy-and-hold abnormal return over the event window (0, 126); 0 is the date on which the deal was announced. Regression (a) includes only deal characteristics. Regression (b) includes deal characteristics and time indicator variables for pre-2006 post-2014 periods. Regression (c) includes only target characteristics. Regression (d) includes deal and target characteristics, as well as time indicator variables. Standard errors are in brackets and are adjusted for heteroskedasticity. Data is obtained from SDC, CRSP, Compustat and Thomson Financials 13F Holdings. Variables are defined in Section 3 as well as in Table C of Appendix C. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	BHAR				Markup BHAR				Premium BHAR			
	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Club	-0.106** (0.054)	-0.112** (0.048)	-0.290*** (0.112)	-0.296** (0.135)	-0.074 (0.087)	-0.107 (0.070)	0.094 (0.207)	-0.062 (0.241)	-0.147** (0.060)	-0.164*** (0.049)	-0.378** (0.150)	-0.438** (0.174)
NClub	-0.241 (0.153)	-0.072 (0.051)	-	-	-0.454 (0.302)	-0.017 (0.153)	-	-	-0.496* (0.274)	-0.130 (0.128)	-	-
PEFirm	-0.064 (0.055)	-0.003 (0.031)	-0.446 (0.289)	-0.446 (0.296)	-0.068 (0.071)	-0.024 (0.049)	-0.545* (0.313)	-0.539* (0.309)	-0.059 (0.065)	0.007 (0.043)	-0.517 (0.339)	-0.526 (0.339)
Other Private	-0.030 (0.029)	-0.044** (0.020)	0.095 (0.119)	0.087 (0.123)	-0.074* (0.043)	-0.092*** (0.028)	0.006 (0.160)	0.074 (0.166)	-0.055 (0.037)	-0.057** (0.025)	0.060 (0.158)	0.098 (0.162)
Pre-2006 x Club		0.010 (0.050)				0.011 (0.087)				0.017 (0.059)		
Pre-2006 x SolePE		0.042 (0.041)				-0.030 (0.052)				0.045 (0.049)		
Pre-2006		-0.076*** (0.012)				0.029 (0.020)				-0.065*** (0.016)		
Post-2014		-0.041** (0.018)				-0.034 (0.024)				-0.062*** (0.019)		
Post-2014 x Club		0.055 (0.070)				0.084 (0.120)				0.161* (0.089)		
Post-2014 x SolePE		0.011 (0.036)				-0.013 (0.057)				0.010 (0.045)		
Tender	0.139*** (0.027)	0.111*** (0.021)		0.109 (0.083)	0.080* (0.046)	0.092*** (0.030)		-0.135 (0.136)	0.093*** (0.036)	0.085*** (0.025)		0.002 (0.114)
Hostile	-0.010 (0.066)	0.070** (0.034)		0.060 (0.147)	0.030 (0.128)	0.001 (0.081)		-0.024 (0.168)	0.184** (0.084)	0.194*** (0.051)		0.085 (0.102)
Diversify	-0.014 (0.014)	-0.017 (0.011)		0.010 (0.029)	0.006 (0.028)	-0.017 (0.019)		0.090* (0.053)	0.006 (0.019)	-0.017 (0.013)		0.043 (0.043)
Defence	0.026 (0.017)	0.002 (0.012)		0.031 (0.034)	0.024 (0.051)	0.038 (0.046)		0.023 (0.088)	0.026 (0.034)	0.033 (0.031)		0.040 (0.055)

Days	-0.000 (0.000)	-0.000 (0.000)	-0.000** (0.000)	-0.000* (0.000)	-0.000*** (0.000)		-0.000 (0.000)	-0.000* (0.000)	-0.000*** (0.000)		-0.000 (0.000)	
Deal Value	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)		0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)		-0.000 (0.000)	
All Cash	0.070*** (0.024)	0.066*** (0.014)	-0.036 (0.048)	0.043 (0.040)	0.033 (0.021)		-0.089 (0.089)	0.030 (0.029)	0.031* (0.016)		-0.091 (0.060)	
Size			-0.000 (0.000)	-0.000 (0.000)		0.000 (0.000)	-0.000 (0.000)			-0.000 (0.000)	0.000 (0.000)	
TobinsQ			0.000 (0.000)	0.000 (0.000)		0.000* (0.000)	0.000 (0.000)			0.000 (0.000)	0.000 (0.000)	
EBITDA/Assets			-0.048 (0.094)	-0.053 (0.093)		-0.101 (0.136)	-0.126 (0.142)			-0.022 (0.125)	-0.038 (0.126)	
Leverage			-0.000 (0.000)	-0.000 (0.000)		0.000 (0.000)	0.000 (0.000)			0.000 (0.000)	0.000 (0.000)	
Inst. Ownership			7.474 (5.907)	8.152 (5.948)		9.913 (8.117)	11.102 (8.057)			2.707 (7.773)	3.726 (7.628)	
Prior 12-month BHAR			-0.008 (0.012)	-0.006 (0.014)		-0.047** (0.022)	-0.051** (0.022)			-0.015 (0.015)	-0.016 (0.016)	
Prior 12-month Volatility			-0.310 (0.323)	-0.238 (0.254)		0.246 (0.386)	0.166 (0.430)			-0.332 (0.312)	-0.356 (0.296)	
Inst. Ownership x Club			-11.715*** (4.296)	-13.521*** (3.955)		4.617 (5.910)	9.600 (7.237)			4.264 (5.370)	5.030 (5.479)	
Inst. Ownership x SolePE			-20.944 (13.618)	-17.933 (13.831)		-35.813 (21.768)	-28.124 (21.864)			-31.118 (19.848)	-26.067 (19.955)	
Constant	0.205*** (0.014)	0.260*** (0.014)	0.187** (0.081)	0.187*** (0.066)	0.355*** (0.025)	0.371*** (0.024)	0.232** (0.096)	0.249** (0.120)	0.250*** (0.019)	0.314*** (0.023)	0.250*** (0.094)	0.261*** (0.087)
Year FE	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,544	3,544	922	922	3,540	3,540	922	922	3,540	3,540	922	922
R-squared	0.064	0.066	0.111	0.135	0.016	0.027	0.074	0.097	0.030	0.035	0.066	0.084

Table 5. Multivariate analysis for target returns: CAR, Markup CAR and Premium CAR.

In this table, multivariate regressions explaining the effect of the different variables on the target returns CAR, Markup CAR and Premium CAR are reported. CAR is the buy-and-hold abnormal return over the event window (-1, 1); Markup CAR is the buy-and-hold abnormal return over the event window (-42, 126); Premium CAR is the buy-and-hold abnormal return over the event window (0, 126); 0 is the date on which the deal was announced. Regression (a) includes only deal characteristics. Regression (b) includes deal characteristics and time indicator variables for pre-2006 post-2014 periods. Regression (c) includes only target characteristics. Regression (d) includes deal and target characteristics, as well as time indicator variables. Standard errors are in brackets and are adjusted for heteroskedasticity. Data is obtained from SDC, CRSP, Compustat and Thomson Financials 13F Holdings. Variables are defined in Section 3 as well as in Table C of Appendix C. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	CAR				Markup CAR				Premium CAR			
	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Club	-0.107*	-0.113**	-0.287**	-0.290**	-0.048	-0.067	0.052	-0.082	-0.149***	-0.169***	-0.352***	-0.403***
	(0.058)	(0.053)	(0.117)	(0.140)	(0.082)	(0.065)	(0.168)	(0.187)	(0.055)	(0.049)	(0.135)	(0.154)
NClub	-0.241	-0.071	-	-	-0.444	-0.058	-	-	-0.482*	-0.142	-	-
	(0.152)	(0.050)			(0.285)	(0.134)			(0.273)	(0.124)		
PEFirm	-0.068	-0.003	-0.461	-0.460	-0.075	-0.010	-0.503*	-0.505*	-0.068	0.006	-0.463	-0.471
	(0.057)	(0.032)	(0.306)	(0.312)	(0.065)	(0.046)	(0.303)	(0.302)	(0.060)	(0.039)	(0.318)	(0.319)
Other Private	-0.027	-0.041**	0.105	0.097	-0.043	-0.069***	0.026	0.072	-0.034	-0.045**	0.061	0.090
	(0.030)	(0.020)	(0.128)	(0.132)	(0.035)	(0.025)	(0.142)	(0.146)	(0.034)	(0.022)	(0.145)	(0.148)
Pre-2006 x Club		0.013				-0.020				0.039		
		(0.054)				(0.078)				(0.054)		
Pre-2006 x SolePE		0.042				-0.039				0.028		
		(0.042)				(0.052)				(0.049)		
Pre-2006		-0.076***				0.015				-0.057***		
		(0.011)				(0.015)				(0.013)		
Post-2014		-0.040**				-0.050**				-0.063***		
		(0.018)				(0.021)				(0.019)		
Post-2014 x Club		0.061				0.067				0.173**		
		(0.076)				(0.099)				(0.081)		
Post-2014 x SolePE		0.011				0.001				0.012		
		(0.037)				(0.052)				(0.042)		
Tender	0.137***	0.108***		0.097	0.103***	0.110***		-0.048	0.108***	0.095***		0.005
	(0.027)	(0.021)		(0.079)	(0.033)	(0.028)		(0.083)	(0.031)	(0.024)		(0.087)
Hostile	-0.012	0.068**		0.050	0.020	-0.023		0.006	0.137*	0.142***		0.091
	(0.061)	(0.033)		(0.125)	(0.099)	(0.063)		(0.135)	(0.078)	(0.044)		(0.094)
Diversify	-0.015	-0.017		0.010	-0.007	-0.017		0.059	-0.006	-0.021*		0.029
	(0.013)	(0.011)		(0.027)	(0.019)	(0.016)		(0.037)	(0.016)	(0.012)		(0.036)
Defence	0.025	0.002		0.030	0.002	0.004		0.011	0.019	0.012		0.037
	(0.017)	(0.012)		(0.032)	(0.032)	(0.031)		(0.065)	(0.027)	(0.024)		(0.045)

Days	-0.000 (0.000)	-0.000 (0.000)	-0.000** (0.000)	-0.000* (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	
Deal Value	-0.000*** (0.000)	-0.000** (0.000)	0.000 (0.000)	-0.000* (0.000)	-0.000*** (0.000)	0.000 (0.000)	-0.000** (0.000)	-0.000** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	
All Cash	0.066*** (0.024)	0.064*** (0.014)	-0.032 (0.047)	0.047 (0.030)	0.041** (0.018)	-0.073 (0.062)	0.034 (0.027)	0.032** (0.016)	-0.067 (0.051)			
Size			-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)			-0.000 (0.000)	0.000 (0.000)		
TobinsQ			0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)			0.000 (0.000)	0.000 (0.000)		
EBITDA/Assets			-0.048 (0.095)	-0.053 (0.094)	-0.102 (0.112)	-0.118 (0.112)			-0.048 (0.110)	-0.060 (0.111)		
Leverage			-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)			0.000 (0.000)	0.000 (0.000)		
Inst. Ownership			7.800 (6.215)	8.436 (6.275)	10.267 (6.680)	11.128* (6.735)			4.060 (6.940)	4.851 (6.874)		
Prior 12-month BHAR			-0.008 (0.012)	-0.006 (0.014)	-0.041* (0.022)	-0.044* (0.023)			-0.012 (0.014)	-0.013 (0.015)		
Prior 12-month Volatility			-0.249 (0.302)	-0.183 (0.239)	0.595* (0.342)	0.567 (0.358)			-0.019 (0.263)	-0.029 (0.255)		
Inst. Ownership x Club			-11.541*** (4.420)	-13.162*** (4.142)	0.662 (4.821)	3.611 (5.192)			3.342 (4.722)	3.875 (4.666)		
Inst. Ownership x SolePE			-21.603 (14.586)	-18.699 (14.704)	-24.245 (17.704)	-19.140 (18.212)			-23.657 (17.947)	-19.873 (18.056)		
Constant	0.204*** (0.013)	0.258*** (0.013)	0.175** (0.080)	0.176*** (0.067)	0.328*** (0.018)	0.306*** (0.038)	0.159** (0.081)	0.156* (0.090)	0.231*** (0.017)	0.277*** (0.019)	0.192** (0.080)	0.197*** (0.073)
Year FE	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,544	3,544	922	922	3,540	3,540	922	922	3,540	3,540	922	922
R-squared	0.063	0.066	0.112	0.133	0.029	0.029	0.101	0.120	0.036	0.036	0.062	0.076

In order to check the robustness of the results obtained from Tables 4 and 5, I perform a robustness check by running regressions on target returns over only the sub-samples Club and Sole PE, therefore only the prominent PE firms' sample. Table 6 reports the results of this robustness check and it shows that club deals are indeed priced lower than sole-sponsored deals: consortia by prominent PE firms pay on average 24% less than single prominent PE firms. This result holds across both CAR and BHAR as well as for the markup and premium periods. In contrast with Tables 4 and 5, Table 7 provides evidence that consortia of prominent PE firms pay a lower takeover premium than single prominent PE firms also over the long term.

Interestingly, the effect of institutional ownership is reversed compared to Table 4 and Table 5, except for the type of returns and return periods that it affects. Table 6 shows that institutional ownership alone has a negative effect over the full sample for the markup periods only, while when combined with the Club indicator variable it has a positive impact on CAR, BHAR and Premium BHAR. This indicates that across prominent PE firms, consortia that acquire targets with higher institutional ownership receive a lower discount on the takeover premium they would otherwise. This result is in line with the findings of Officer et al. (2010) and it might be more accurate than the one in Tables 4 and 5, given a larger sample size than the sample for regressions (c) a (d) in Tables 4 and 5 where the effect of institutional ownership is tested. Institutional ownership seems to be mitigating the effect on prices of club deals by prominent PE firms, even if only over the short term. Nevertheless, the overall impact of institutional ownership is negative over the long term. This result could lead to speculate that there might be some institutions that work closely with some prominent PE firms, leading to lower competition levels and prices. Finally, Table 6 also reports that in the pre-2006 and post-2014 periods consortia of prominent PE firms paid an even lower takeover premium over the short term than single prominent PE firms.

In Table 7, I run a multivariate regression analysis over the club deal sample (including both prominent and non-prominent PE firms) as well as the prominent PE firms' sample in order to assess the relationship between deal value, club deals and takeover premia. Table 7 shows that club deals by prominent PE firms pay a lower takeover premium (96% less) also when compared to club deals by non-prominent PE firms, even if only over the shorter-term periods. Moreover, in Panel A larger club deals increase target returns over the short term, specifically for club deals by non-prominent PE firms. This result provides opposite evidence to Hypothesis 7. In Panel B, larger deals by prominent PE firms increase target returns over

Table 6. Robustness check for explaining target returns with only prominent PE firms.

In this table, multivariate analyses explaining target returns including only the sample of prominent PE firms, therefore Club and SolePE, are reported. Variables are defined in Table C of Appendix C. Data is obtained from SDC, CRSP and Thomson Financials 13F Holdings. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	BHAR	CAR	Markup BHAR	Markup CAR	Premium BHAR	Premium CAR
Club	-0.186*** (0.060)	-0.175** (0.069)	-0.335*** (-0.121)	-0.276*** (-0.094)	-0.252*** (0.070)	-0.233*** (0.07)
Diversify	-0.020 (0.045)	-0.019 (0.06)	-0.047 (0.105)	-0.035 (0.082)	0.006 (0.070)	-0.004 (0.061)
Days	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Deal Value	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
All Cash	0.068* (0.035)	0.070* (0.04)	0.028 (0.07)	0.03 (0.055)	-0.001 (0.038)	0.015 (-0.041)
Size	-0.000 (0.000)	0.000 (0.000)	-0.000* (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Inst. Ownership	2.559 (10.348)	3.466 (6.337)	-22.34** (11.116)	-14.729* (8.666)	-4.446 (8.510)	-1.295 (6.468)
Inst. Ownership x Club	30.032** (11.681)	32.991** (16.018)	19.817 (28)	13.087 (22)	23.989** (11.755)	24.108 (16.349)
Prior 12-month BHAR	-0.060*** (0.019)	-0.064* (0.033)	0.001 (0.057)	-0.003 (0.045)	-0.001 (0.022)	-0.005 (0.033)
Prior 12-month Volatility	-0.250 (0.461)	-0.313 (0.372)	1.766*** (0.653)	1.369*** (0.509)	0.321 (0.499)	0.182 (0.38)
Pre-2006 x Club	-0.089* (0.052)	-0.096 (0.065)	-0.076 (0.113)	-0.059 (0.088)	-0.113* (0.058)	-0.109 (0.066)
Post-2014 x Club	-0.086* (0.045)	-0.077 (0.154)	-0.206 (0.27)	-0.121 (0.21)	-0.039 (0.053)	-0.041 (0.157)
Constant	0.196*** (0.053)	0.191*** (0.062)	0.260** (0.109)	0.235*** (0.085)	0.179*** (0.055)	0.164** (0.064)
Year FE	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	143	143	142	142	142	142
R-squared	0.429	0.426	0.417	0.451	0.438	0.436

the long term, but by very little (nearly 0%⁴). The pre-2006 and post-2014 periods decrease target returns in Panel A, while in Panel B the post-2014 period increases target returns. This result indicates that in the years after 2014 club deals obtained higher takeover premium discounts over the short term, but also that prominent PE firms obtained a lower discount. Therefore, it seems that, over the short term, in the pre-2006 period prominent PE firms paid a higher takeover premium discount in club deals than sole-sponsored deals by prominent PE firms and club deals by non-prominent PE firms; while they paid a lower discount after 2014.

⁴ Estimates are rounded up to 3 decimals, therefore if the regression reports a coefficient of 0.000 it might mean that, for instance, the full coefficient is 0.0003, which is still greater than 0 and indicates a positive impact on the dependent variable.

Table 7. Multivariate analysis for the effect of deal value on target returns.

In this table, the effect of deal value on target returns is analysed. As a robustness check these regressions include only club deals (both by prominent and non-prominent PE firms, therefore the sub-samples Club and NClub) and only prominent PE firms in Panel A and B, respectively. Data is obtained from SDC, CRSP and Thomson Financials 13F Holdings. Variables are defined in Section 3 as well as in Table C of Appendix C. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	BHAR	CAR	Markup BHAR	Markup CAR	Premium BHAR	Premium CAR
<i>Panel A: Club deals sample – Prominent and non-prominent PE firms.</i>						
Club	-1.008*** (0.044)	-1.045*** (0.037)	1.538 (1.502)	0.906 (1.215)	-1.024 (0.741)	-1.152* (0.641)
Deal Value x Club	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.000 (0.000)
Deal Value x NClub	0.848*** (0.066)	0.903*** (0.062)	-2.470 (1.628)	-1.613 (1.319)	0.780 (0.799)	0.930 (0.691)
Diversify	0.001 (0.001)	0.001 (0.001)	0.003* (0.001)	0.002* (0.001)	-0.001 (0.002)	-0.001 (0.002)
Days	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
All Cash	0.135*** (0.019)	0.125*** (0.020)	0.505*** (0.089)	0.410*** (0.079)	0.135*** (0.039)	0.127*** (0.039)
Size	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Institutional Ownership	-29.604*** (2.183)	-30.858*** (1.939)	47.223 (70.716)	28.554 (57.374)	-38.082 (36.130)	-42.417 (31.402)
Inst. Ownership x Club	69.992*** (4.112)	71.530*** (3.938)	-34.067 (82.424)	-6.096 (66.389)	71.573* (40.497)	78.844** (35.227)
Prior 12-month BHAR	0.017 (0.012)	0.005 (0.012)	0.705*** (0.225)	0.488*** (0.181)	0.076 (0.114)	0.038 (0.100)
Prior 12-month Volatility	0.105 (0.133)	-0.026 (0.128)	4.610* (2.496)	2.931 (2.006)	-0.414 (1.335)	-0.607 (1.185)
Pre-2006	-0.132*** (0.008)	-0.126*** (0.008)	-0.040 (0.121)	-0.014 (0.097)	-0.015 (0.077)	-0.014 (0.071)
Post-2014	-0.044* (0.024)	-0.014 (0.025)	-0.046 (0.171)	-0.071 (0.140)	-0.003 (0.086)	-0.010 (0.078)
Constant	-0.001*** (0.000)	-0.001*** (0.000)	0.002 (0.001)	0.001 (0.001)	-0.001 (0.001)	-0.001* (0.001)
Year FE	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	77	77	77	77	77	77
R-squared	0.993	0.993	0.755	0.728	0.669	0.712
<i>Panel B: Deals made by prominent PE firms.</i>						
Club	-0.212*** (0.072)	-0.199*** (0.075)	-0.497*** (0.087)	-0.408*** (0.070)	-0.313*** (0.063)	-0.283*** (0.059)
Deal Value x Club	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.000 (0.000)
Deal Value x Sole PE	-0.000 (0.000)	-0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)
Diversify	0.022 (0.046)	0.026 (0.048)	-0.016 (0.040)	-0.004 (0.028)	0.062 (0.077)	0.049 (0.061)
Days	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
All Cash	0.067* (0.035)	0.069** (0.034)	0.040 (0.050)	0.042 (0.037)	0.004 (0.032)	0.018 (0.027)
Size	-0.000 (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)

Institutional Ownership	6.258 (10.805)	7.761 (10.795)	-26.987*** (8.587)	-18.146** (7.298)	-0.693 (8.746)	2.744 (9.429)
Inst. Ownership x Club	21.549 (14.365)	23.439* (13.753)	34.795** (17.059)	25.673* (15.012)	18.764 (13.668)	17.521 (13.474)
Prior 12-month BHAR	-0.062*** (0.018)	-0.067*** (0.021)	0.015 (0.043)	0.007 (0.029)	-0.004 (0.020)	-0.009 (0.020)
Prior 12-month Volatility	-0.376 (0.290)	-0.447 (0.314)	1.805*** (0.535)	1.341*** (0.398)	0.086 (0.316)	-0.042 (0.309)
Pre-2006	-0.042 (0.029)	-0.049* (0.028)	-0.041 (0.066)	-0.022 (0.052)	-0.035 (0.034)	-0.035 (0.034)
Post-2014	0.112** (0.053)	0.124** (0.053)	-0.164*** (0.049)	-0.092** (0.040)	0.139** (0.063)	0.143** (0.054)
Constant	0.206*** (0.056)	0.200*** (0.054)	0.307*** (0.077)	0.270*** (0.062)	0.196*** (0.051)	0.179*** (0.053)
Year FE	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	143	143	142	142	142	142
R-squared	0.464	0.465	0.449	0.480	0.480	0.479

In order to better understand the role played by deal value in club deals and to test Hypothesis 8, I further investigate the effect of deal value on club formation. Following Boone and Mulherin (2011), Table 8 reports the results of a probit regression model on club formation with an analysis over deals completed by PE firms, either prominent or non-prominent and either single or in a club. In this analysis, I also include target size (Size) in order to investigate a possible relation between deal value and target size, as one is often reflective of the other.

Table 8 shows that both deal value and target size contribute to club formation, even if only for consortia of prominent PE firms. The pre-2006 period also has a positive effect on the probability club formation, for both Club and NClub sub-samples, which is in line with the results by Boone and Mulherin (2011) and Officer et al. (2010). The post-2014 period instead decreases the probability of club formation by prominent PE firms: after 2014 it was less likely that prominent PE firms would club. These results indicate that before 2006 club formation was more likely and less likely after 2014, providing evidence that the events of 2006 and 2014 played a role in club formation probability and, by extension, club deal activity. However, consortia of non-prominent PE firms are not impacted by any other variable, only by a positive effect of the pre-2006 period. Therefore, while the pre-2006 greater probability of club formation applies for all club deals, the post-2014 period was relevant only for prominent PE firms. This result might provide evidence that the events surrounding the largest PE firms in 2014 deterred from engaging in club deal activity in the following years. Finally, Table 8 also reports that tender offers decrease the likelihood of club formation by prominent PE firms.

Table 8. Probit model: effect of deal value on club formation.

In this table, the effect of deal value (Deal Value) and of target size (Size) on club formation (Club and NClub) is analysed over the PE firms' sample: the sub-samples included are Club, NClub, SolePE, and PEFirm. Specification (a) includes deal characteristics, time indicator variables and target size, while specifications (b) and (c) include only deal value and target size, respectively. Variables are defined in Section 3 as well as in Table C of Appendix C. Data is obtained from SDC and CRSP. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	Club			NClub		
	(a)	(b)	(c)	(a)	(b)	(c)
Deal Value	0.000* (0.000)	0.000*** (0.000)		0.000 (0.000)	-0.000 (0.000)	
Tender	-0.951*** (0.328)			0.043 (0.301)		
Diversify	0.273 (0.331)					
Pre-2006	0.380** (0.177)			0.431* (0.256)		
Post-2014	-0.427* (0.243)			-0.388 (0.423)		
Size	-0.000 (0.000)		0.000** (0.000)	-0.000 (0.000)		-0.000 (0.000)
All Cash	-0.185 (0.172)			0.174 (0.243)		
Constant	-0.950*** (0.145)	-0.921*** (0.080)	-1.022*** (0.084)	-1.965*** (0.252)	-1.721*** (0.123)	-1.733*** (0.127)
Observations	386	403	386	365	403	386

5.3 Multivariate Analysis on Target Performance

In order to test Hypotheses 5 and 6, I perform a multivariate analysis for both the full sample and only the sample of PE firms in order to understand the effect of PE deals on target profitability and growth, measured as explained in Section 3 with equations 10, 11, and 12. Table 9 shows no significant effect of club deals by prominent PE firms on target performance compared to sole-sponsored deals by prominent PE firms. Instead, non-prominent single PE firms (PEFirm) increase *ex-post* target profitability and growth as measured by the number of employees. Over the following two years, as compared to the year prior to the takeover, tender offers result to be detrimental for target growth, while using defence strategies has the opposite effect on target profitability. Moreover, deals that are paid all-cash result in greater growth. The overall effect of pre-2006 is negative on *ex-post* target growth, as measured by assets; while sole-sponsored deals by prominent PE firms result in a higher *ex-post* profitability but a lower growth, as measured by the number of employees. All the other variables are statistically insignificant.

In order to test the accuracy of the results from Table 9, I perform a robustness check in Table 10 by running a multivariate regression analysis explaining target performance by including only deals by PE firms, either club or sole-sponsored and either prominent or non-prominent. Table 10 shows that club deals by prominent PE firms increase target growth as

Table 9. Multivariate analysis for target performance.

In this table, the effect over the full sample of sub-samples indicators, time indicators and deal characteristics on target performance, measured as profitability and growth, is presented. Variables are described in Section 3 as well as in Table C of Appendix C. Data is retrieved from SDC, CRSP and Compustat. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	Profitability	Growth _a	Growth _b
Club	48,260.149 (53,283.826)	1.372 (0.971)	0.632 (1.106)
NClub	-5,666.375 (49,782.519)	1.064 (0.660)	-0.517 (1.472)
PEFirm	73,842.803* (38,979.773)	0.531 (0.538)	0.674* (0.355)
Other Private	-13,036.959 (31,675.675)	-0.443 (0.384)	0.030 (0.346)
Tender	-30,343.990 (24,301.219)	-0.392* (0.232)	-0.421** (0.181)
Hostile	-325.589 (33,864.747)	0.260 (0.431)	0.823 (0.508)
Defence	30,328.277* (16,932.685)	-0.208 (0.250)	0.150 (0.200)
Days	20.718 (50.703)	-0.000 (0.001)	0.000 (0.001)
Deal Value	0.300 (0.650)	-0.000 (0.000)	0.000 (0.000)
All Cash	5,819.740 (15,339.776)	0.449* (0.229)	0.458* (0.248)
Pre-2006	24,785.853 (20,659.396)	-0.531*** (0.188)	0.036 (0.199)
Post-2014	-58,919.113 (38,110.371)	0.020 (0.439)	-0.285 (0.394)
Pre-2006 x Club	-19,878.516 (70,100.047)	-1.553 (1.302)	-0.378 (1.365)
Pre-2006 x Sole PE	-53,415.879 (64,058.149)	0.420 (0.668)	-0.191 (0.521)
Post-2014 x Club	-	-	-
Post-2014 x Sole PE	115,818.207*** (36,170.295)	-0.276 (0.584)	-0.982** (0.494)
Constant	71,390.691*** (20,237.780)	20.458*** (0.177)	13.983*** (0.189)
Year FE	No	No	No
Industry FE	Yes	Yes	Yes
Observations	869	869	869
R-squared	0.039	0.033	0.022

measured by assets: club deals by prominent PE firms have more assets *ex-post* than sole-sponsored deals by prominent PE firms. Also, sole-sponsored deals by non-prominent PE firms have a greater *ex-post* profitability but lower number of assets compared to sole-sponsored deals by prominent PE firms. Private bidders that are not prominent PE firms also obtain a greater *ex-post* target profitability. Compared to sole-sponsored deals by prominent PE firms, *ex-post* target profitability is lower if the takeover is hostile, defence strategies are used, deal

value is large, and the deal was made in the pre-2006 period. Deal made prior to 2006 also report lower target growth as measured by number of employees. Interestingly, in club deals by prominent PE firms prior to 2006, targets achieved greater levels of growth through an increase in the number of employees. In the same years, in sole-sponsored deals by prominent PE firms, targets achieved greater levels of growth but, instead, as measured by the number of assets.

Table 10. Robustness check for explaining target profitability and growth with only PE firms.

In this table, the effect over the PE firms' sample of sub-samples indicators, time indicators and deal characteristics on target profitability and growth is presented. Variables are described in Section 3 as well as in Table C of Appendix C. Data is retrieved from SDC, CRSP and Compustat. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	Profitability	Growth _a	Growth _b
Club	-22,901.416 (17,800.266)	1.317** (0.537)	0.548 (0.714)
NClub	-	-	-
PEFirm	265,902.427*** (44,694.608)	-1.330* (0.718)	-0.934 (1.849)
Other Private	143,771.556** (65,932.707)	-2.074 (1.262)	-1.826 (1.292)
Tender	49,636.126 (73,232.887)	-3.347 (3.117)	-0.047 (0.725)
Hostile	-556,139.372*** (173,184.532)	2.419 (1.664)	2.444 (6.926)
Defence	-1,994.068*** (352.126)	0.005 (0.011)	0.005 (0.011)
Days	34.218*** (12.627)	-0.000 (0.000)	-0.000 (0.000)
Deal Value	-227,220.630*** (19,355.266)	-0.298 (0.500)	0.314 (1.021)
All Cash	122,935.479** (53,961.345)	-0.487 (0.768)	-2.751 (1.736)
Pre-2006	-126,744.083*** (27,043.541)	-1.175 (0.896)	-3.504*** (0.425)
Post-2014	-	-	-
Pre-2006 x Club	-535.607 (69,589.793)	2.112 (1.890)	2.362** (0.941)
Pre-2006 x Sole PE	-22,901.416 (17,800.266)	1.317** (0.537)	0.548 (0.714)
Post-2014 x Club	-	-	-
Post-2014 x Sole PE	-	-	-
Constant	52,157.774 (65,785.353)	20.499*** (1.875)	14.685*** (1.790)
Year FE	No	No	No
Industry FE	Yes	Yes	Yes
Observations	60	60	60
R-squared	0.867	0.643	0.620

Overall, Table 9 and 10 provide evidence that prominent PE firms increase target growth, while non-prominent PE firms have a larger impact on profitability. It could maybe be possible that prominent PE firms focus on and target firms that are more mature due and focus on other financials rather than profitability, such as growth or returns. Following this reasoning, more mature firms might take more than just two years to implement new strategies and show their positive effects on financials.

5.4 Bidding Process Characteristics and Competition Levels

In order to test the theoretical model by Marquez and Singh (2013) and therefore to test Hypotheses 9 and 10, I perform a multivariate analysis on the effect of bidding characteristics and competition levels on target returns as well as a multivariate analysis specifically on competition levels, following then the study of Boone and Mulherin (2011). Table 11 shows the distribution of the data collected from the SEC merger filings database EDGAR for each club deal, whether prominent or not. Across the two club deals samples Club and NClub, the change in means for each measure of competition is alike: the largest number of firms involved are in the Contact phase and the lowest in the Indication of Interest phase.

If the takeover is target-initiated, the bidding process normally works as follows. First, the target firm contacts a number of firms that it thinks might be interested in a takeover from a strategic or a financial point of view. Then, the target firm sends confidentiality agreements to those who expressed interest in the Contact phase, in order to allow bidding firms to include non-public information into their financial valuation and offer. In the Confidentiality phase, the contacted firms became aware of the due diligence costs and obtain non-public information about the target firm. Finally, the potential bidders are those who perform due diligence and then send an indication of interest, which is a non-binding offer. Potential bidders also have to send a further final offer if they decide to continue in the bidding process, and the target firm then chooses the best offer. From the SEC merger filings, it emerges that consortia are often formed before the bidding process even starts. In other situations, a firm that is already involved in the process then asks the target firm that other parties, with whom the target firm has had no prior contact, join its bid. Rarely, I read in the SEC filings of bidding processes in which single bidders decided to club with one or more single bidders that had independently expressed an interest in the takeover.

If the takeover is not target-initiated, it is often the case that the potential bidder and the target make a deal and after the target initiates a go-shop period, during which the bid is made

Table 11. Bidding process characteristics and competition level measures.

In this table, in Panel A the means in both club deals samples (Club and NClub) for the three measures of competition level Contact, Confidentiality and Indication of Interest are reported. Panel B shows instead the ratios of the dummy variables Go Shop and Target Initiated relative to the total number of observations. Variables are defined in Section 3 as well as in Table C of Appendix C.

	Club	NClub
<i>Panel A: Measures of Competition</i>		
Contact	19.7	30.2
Confidentiality	10.5	16.9
Indication of Interest	6.3	5.2
Observations	73	22
<i>Panel B: Bidding Process Characteristics</i>		
Go Shop ratio	0.21	0.09
Target Initiated ratio	0.54	0.48
Observations	73	22

public and more firms have the opportunity to sign confidentiality agreements or send an offer. Throughout all the club deal bidding processes investigated in this research study, no firm ever sent an indication of interest or a non-binding offer that was seriously taken into consideration. It never happened that one or more firms that were part of a PE consortium came from a go-shop period. Table 11 shows, however, that takeovers by prominent PE firms were primarily target-initiated (54%), with only 21% of these including a go-shop period. On the other hand, takeovers by non-prominent PE firms are primarily acquirer-initiated (52%), with only 9% of them including a go-shop period. Nevertheless, when data regarding specifics of the bidding process was not found on the SEC merger filings, which often happened for deals from the 1980s and 1990s and especially for the NClub sub-sample, data was gathered from a text search in the SDC transaction synopses.

Table 12 shows the results of a multivariate analysis explaining target returns in club deals, including bidding process characteristics and competition level measures. Due to collinearity issues among the measures of competition level, I perform three different regressions on each target return measure: (a) includes only the competition measure Indication of Interest, (b) includes only the competition measure Contact, and (c) includes only the competition measure Confidentiality.

Tables 12 and 13 show that a larger number of potential bidders (i.e. greater Indication of Interest) has a negative impact on target returns, across all measures. Therefore, fewer potential bidders (i.e. fewer indications of interest sent) do not result in the target receiving a lower takeover premium. The other measures of competition level are statistically insignificant across all target returns. Interestingly, in these regressions of Tables 12 and 13 that control for bidding process characteristics and competition levels, the effect of club deals by prominent

Table 12. Multivariate analysis on target BHARs combined with bidding process characteristics.

In this table, the effects of bidding process characteristics on target returns is analysed. Data regarding the bidding process on the SEC merger filings (database EDGAR) is obtained only for club deals, therefore the sample for these regression analyses includes club deals by prominent PE firms (Club) and by non-prominent PE firms (NClub) only. (a), (b) and (c) are specifications that indicate the inclusion of either only Indication of Interest, Contact or Confidentiality, respectively. The raw dataset containing all information obtained from the SEC merger filings can be found in Table D.1. of Appendix D. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	BHAR			Markup BHAR			Premium BHAR		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Club	0.268*** (0.021)	0.244*** (0.043)	0.256*** (0.038)	-0.351* (0.198)	-0.417 (0.338)	-0.315 (0.220)	0.146*** (0.053)	-0.015 (0.138)	0.081 (0.122)
Diversify	-0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	-0.007 (0.008)	-0.005 (0.007)	-0.004 (0.005)	-0.002 (0.002)	0.001 (0.002)	-0.001 (0.002)
Days	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001*** (0.000)	-0.001 (0.000)	-0.001 (0.000)	-0.001*** (0.000)	0.000 (0.000)	-0.000 (0.000)
Deal Value	0.000*** (0.000)	0.000 (0.000)	0.000* (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)
All Cash	0.083*** (0.018)	0.018 (0.024)	0.026 (0.025)	0.495*** (0.104)	0.283*** (0.092)	0.282* (0.153)	0.293*** (0.036)	0.005 (0.085)	0.061 (0.106)
Size	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Institutional Ownership	18.056*** (1.468)	17.252*** (4.300)	18.607*** (3.356)	-29.301** (11.274)	-30.597 (29.015)	-21.547 (22.040)	5.111* (2.897)	-4.352 (13.691)	6.339 (13.755)
Prior 12-month BHAR	0.155*** (0.013)	0.124*** (0.020)	0.117*** (0.026)	0.379** (0.156)	0.273* (0.157)	0.290 (0.173)	0.236*** (0.048)	0.115* (0.068)	0.068 (0.105)
Prior 12-month Volatility	1.659*** (0.112)	1.633*** (0.328)	1.683*** (0.391)	2.935** (1.110)	2.979 (2.557)	4.336* (2.467)	0.537 (0.439)	-0.150 (1.289)	0.396 (1.575)

Pre-2006 x Club	-0.238*** (0.035)	-0.347*** (0.040)	-0.330*** (0.067)	0.719** (0.282)	0.354 (0.291)	0.233 (0.413)	0.262** (0.105)	-0.187 (0.153)	-0.091 (0.259)
Post-2014 x Club	-0.131*** (0.022)	-0.025 (0.032)	-0.040*** (0.014)	-0.063 (0.161)	0.282 (0.251)	0.259*** (0.079)	-0.275*** (0.037)	0.209** (0.103)	0.101** (0.047)
Indication of Interest	-0.009*** (0.001)			-0.030*** (0.010)			-0.038*** (0.003)		
Target Initiated	0.147*** (0.010)	0.171*** (0.054)	0.148*** (0.030)	-0.469*** (0.129)	-0.414 (0.289)	-0.582*** (0.207)	-0.003 (0.048)	0.207 (0.154)	0.023 (0.124)
Go Shop	0.118*** (0.010)	0.071*** (0.021)	0.080*** (0.014)	-0.061 (0.099)	-0.211 (0.161)	-0.162* (0.087)	0.052* (0.028)	-0.183** (0.072)	-0.113** (0.053)
Contact		-0.001 (0.001)			-0.001 (0.005)			-0.004 (0.002)	
Confidentiality			-0.001 (0.002)			0.005 (0.009)			-0.005 (0.005)
Constant	-0.450*** (0.041)	-0.407*** (0.081)	-0.423*** (0.086)	0.325 (0.421)	0.440 (0.659)	0.189 (0.491)	-0.160 (0.120)	0.141 (0.267)	-0.006 (0.269)
Year FE	No	No	No	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71	71	71	71	71	71	71	71	71
R-squared	0.989	0.975	0.974	0.819	0.780	0.790	0.935	0.780	0.715

Table 13. Multivariate analysis on target CARs combined with bidding process characteristics.

In this table, the effects of bidding process characteristics on target returns is analysed. Data regarding the bidding process on the SEC merger filings (database EDGAR) is obtained only for club deals, therefore the sample for these regression analyses includes club deals by prominent PE firms (Club) and by non-prominent PE firms (NClub) only. a), (b) and (c) are specifications that indicate the inclusion of either only Indication of Interest, Contact or Confidentiality, respectively. The raw dataset containing all information obtained from the SEC merger filings can be found in Table D.1. of Appendix D. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	CAR			Markup CAR			Premium CAR		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
Club	0.272*** (0.020)	0.245*** (0.043)	0.258*** (0.039)	-0.235 (0.169)	-0.295 (0.290)	-0.206 (0.190)	0.163*** (0.051)	0.013 (0.132)	0.102 (0.117)
Diversify	-0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	-0.006 (0.007)	-0.004 (0.006)	-0.003 (0.004)	-0.002 (0.002)	0.001 (0.002)	-0.001 (0.002)
Days	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001*** (0.000)	-0.000 (0.000)	-0.001 (0.000)	-0.001*** (0.000)	0.000 (0.000)	-0.000 (0.000)
Deal Value	0.000*** (0.000)	0.000 (0.000)	0.000* (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)
Payment Method	0.085*** (0.017)	0.015 (0.026)	0.025 (0.026)	0.421*** (0.087)	0.231*** (0.081)	0.232* (0.134)	0.260*** (0.033)	-0.014 (0.082)	0.039 (0.101)
Size	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Institutional Ownership	18.556*** (1.402)	17.520*** (4.358)	19.052*** (3.465)	-18.231* (9.551)	-19.550 (24.982)	-11.601 (19.185)	6.083** (2.769)	-2.618 (13.162)	7.276 (13.062)
Prior 12-month BHAR	0.152*** (0.013)	0.119*** (0.020)	0.110*** (0.027)	0.285** (0.133)	0.191 (0.135)	0.204 (0.150)	0.214*** (0.045)	0.099 (0.064)	0.054 (0.099)
Prior 12-month Volatility	1.543*** (0.105)	1.498*** (0.331)	1.546*** (0.402)	2.076** (0.952)	2.101 (2.213)	3.262 (2.147)	0.618 (0.400)	-0.007 (1.225)	0.488 (1.495)

Pre-2006 x Club	-0.224*** (0.033)	-0.340*** (0.040)	-0.320*** (0.069)	0.583** (0.242)	0.257 (0.252)	0.158 (0.359)	0.195** (0.096)	-0.235 (0.146)	-0.143 (0.246)
Post-2014 x Club	-0.109*** (0.021)	0.006 (0.032)	-0.012 (0.014)	-0.099 (0.135)	0.210 (0.216)	0.188*** (0.068)	-0.264*** (0.035)	0.196* (0.099)	0.095** (0.045)
Indication of Interest	-0.010*** (0.001)			-0.027*** (0.009)			-0.036*** (0.003)		
Target Initiated	0.150*** (0.010)	0.179*** (0.056)	0.153*** (0.031)	-0.324*** (0.111)	-0.272 (0.249)	-0.419** (0.180)	0.033 (0.044)	0.227 (0.149)	0.057 (0.117)
Go Shop	0.122*** (0.009)	0.070*** (0.021)	0.081*** (0.014)	-0.007 (0.084)	-0.141 (0.139)	-0.098 (0.076)	0.055** (0.026)	-0.168** (0.068)	-0.102** (0.051)
Contact		-0.001 (0.001)			-0.001 (0.004)			-0.004 (0.002)	
Confidentiality			-0.001 (0.002)			0.004 (0.008)			-0.004 (0.005)
Constant	-0.448*** (0.040)	-0.399*** (0.081)	-0.416*** (0.088)	0.214 (0.359)	0.320 (0.566)	0.104 (0.423)	-0.178 (0.113)	0.102 (0.254)	-0.032 (0.258)
Year FE	No	No	No	No	No	No	No	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71	71	71	71	71	71	71	71	71
R-squared	0.990	0.975	0.974	0.771	0.717	0.727	0.941	0.788	0.732

PE firms on target returns over the short term becomes positive, which may be due to correlation. When it comes to bidding process characteristics, target-initiated deals increase the takeover premium received by the target firm over the short term across all target return measures, while they decrease it over the longer-term markup period in specifications (a) and (c). A negative effect of target-initiated deals on target returns is also documented in previous literature (Masulis & Simsir, 2018). The same effects apply for the inclusion of a go-shop period in the bidding process. Therefore, if a target firm is short-term thinking it is best for its returns if it starts the bidding process itself compared to being approached by other parties, and if it includes a go-shop period when needed.

Tables 12 and 13 provide evidence that target-initiated club deals obtain a takeover premia discount of on average 45% over the long term. On the other hand, target-initiated club deals obtain higher takeover premia by on average 16% more than acquirer-initiated club deals over the short term. Even though there is evidence for such an effect for CAR, BHAR, Premium BHAR and Premium CAR, longer event windows, such as Markup CAR and Markup BHAR, might take the differences in bidding processes into account better across the two different typologies of PE consortia and, therefore, might report a more accurate result (Boone and Mulherin, 2011). The long-term results of target-initiated club deals seem to indicate that targets hurt themselves by initiating the deal, worsening their bargaining position. This result is also in line with previous literature (Aktas, Bodt & Roll, 2010; Masulis & Simsir, 2018). Finally, including a go-shop period leads to an average increase of 1.4% in the takeover premium. Overall, Tables 12 and 13 provide evidence against the hypothesis derived from the model by Marquez and Singh (2013) that a lower number of potential bidders decreases takeover premia and therefore results in a greater discount for club deals.

Finally, I perform a multivariate analysis explaining the effect of club deals on competition levels. Table 14 reports the results of this analysis and shows that club deals by prominent PE firms do not have an impact on any competition level. Target size decreases all competition levels, even if by a small amount (around 0%, but still positive). The interaction effect of the pre-2006 period and club deals by prominent PE firms provides evidence that in the years prior 2006 many more firms were contacted and signed a confidentiality agreement in a club deal bidding process. Instead, the years after 2014 are characterised by a lower number of indications of interest sent (i.e. a lower number of potential bidders) as well as a less confidentiality agreements signed.

Overall, Table 14 provides evidence that the years prior 2006 were characterised by greater competition among prominent PE firms in club deals, and that target size is the only

deal-specific variable that reduces competition levels. Combining these results with the ones of table 8, it seems that since 2014 there is less club deal activity and competition than in the prior years. Therefore, lower competition levels as analysed by post-2014 x Club is more likely to be attributed to a lower club deal activity rather than possible collusive behaviour. Even though I do not find evidence that deal size negatively affects competition levels, results indicate that larger targets are characterised by slightly lower competition levels. I do not find evidence supporting either Hypothesis 9 or 10.

Table 14. Multivariate analysis on competition levels.

In this table, a multivariate analysis on the three measures of competition is reported over the club deals sample (Club and NClub). Each variable is defined in Section 2, 3 as well as in Appendix C. Data is manually retrieved from the SEC merger filings' database EDGAR. Standard errors are in brackets and are adjusted for heteroskedasticity. Statistical significance is marked as *** for a p-value < 0.01, ** for a p-value < 0.05, * for a p-value < 0.1.

Variable	Ind. of Interest	Contact	Confidentiality
Club	1.664 (1.303)	-8.599 (13.157)	1.164 (5.637)
Deal Value	0.000 (0.000)	0.003** (0.001)	0.001 (0.001)
Size	-0.000** (0.000)	-0.000*** (0.000)	-0.000** (0.000)
All Cash	0.408 (3.335)	21.456 (15.007)	5.547 (7.581)
Pre-2006 x Club	4.941 (4.550)	40.608*** (12.181)	18.867** (8.531)
Post-2014 x Club	-5.992** (2.871)	-7.651 (5.359)	-12.411*** (3.564)
Constant	3.601 (3.790)	13.617 (17.286)	4.013 (10.196)
Year FE	No	No	No
Industry FE	Yes	Yes	Yes
Observations	87	85	84
R-squared	0.533	0.630	0.595

6. Discussion & Conclusion

In the second half of the 20th century, LBOs were created as an alternative to the already-existing practice for corporate renewal and development M&A (Kaplan & Strömberg, 2009; Jensen, 1989; Bradford & Smith, 1997). The market for corporate control witnessed an LBO boom in the 1980s and at the beginning of the 21st century up to the financial crisis of 2008 (Kaplan & Strömberg, 2009). Nevertheless, PE firms performing such LBOs were seen as “locusts” as the origin of their returns was often questioned and PE firms were seen as job destroyers that would overload targets with debt (Froud & Williams, 2007; Phalippou, 2009; Perry & Williams, 1994; Antoni, Maug & Obernberger, 2019). In particular, PE club deals have been under the scrutiny of the public and academic eye as doubts arose regarding whether PE firms decided to jointly bid and invest in targets out of *bona fide* or because of collusion motives (Officer et al., 2010; Boone and Mulherin, 2011; Barger et al., 2008; Alden, 2014). Allegations of collusion motives consisted of PE firms deciding to jointly bid in order to obtain a takeover premium discount through lowering competition levels (Marquez & Singh, 2013; Boone and Mulherin, 2011; Officer et al., 2010). Analysing club deals and bidding processes, Marquez and Singh (2013) develop a theoretical model explaining the role played by bidding costs and competition levels on club formation and target revenue. Previous literature finds contrasting results regarding whether PE firms do indeed collude and affect competition levels (Officer et al., 2010; Boone and Mulherin, 2011).

Based on previous events and literature, in this paper I tried to answer the following research question “What role do Private Equity club deals play in competition and target value creation?”. I also tried to answer the following sub-questions: (a) “What is the effect of PE club deals on post-buyout target performance?”, (b) “To what extent do bidding costs and competition levels affect target returns and club formation?”, and (c) “Are there possible collusion motives in PE consortia?”. I focused on the effect of club deals by prominent PE firms compared to sole-sponsored deals by prominent PE firms.

Hypothesis 1 is supported by the data: I find that consortia of prominent PE firms pay 24% less than single prominent PE firms. Nevertheless, in line with the findings of Boone and Mulherin (2011), I also find that, when analysing the full sample, takeover premium discounts in club deals hold only for shorter event windows (i.e. CAR3, premium). I also find evidence that club deals by prominent PE firms are priced 96% lower than club deals by non-prominent PE firms over the short term. Long-term event windows are however more reliable as they might take differences in bidding processes into account more accurately (Boone and Mulherin,

2011). Hypothesis 2 is partially supported by the data: club deals by prominent PE firms pay an even lower takeover premium than single prominent PE firms in the pre-2006 and post-2014 periods, but only over the short term. I find no evidence of such an effect over the long term, contrary to Officer et al. (2010). Differences between this study's results and the findings of Officer et al. (2010) and Boone and Mulherin (2011) might be due to differences in samples: contrary to the two papers, I include only U.S. acquirers, I set the payment method to be either all-cash, all-stock or a mix of the two, and I also include prominent PE firms which are retrieved from the list of the 2019 PEI ranking edition in the sample.

Hypothesis 3 is supported by the data: summary statistics report that on average PE club deals are larger than sole-sponsored PE deals, independently of whether the club is made by prominent or non-prominent PE firms. This result is in line with previous research stating that PE consortia tend to pursue larger deals that require high amounts of leverage, which could not be supported otherwise (Shivdasani & Wang, 2011). When it comes to Hypothesis 4, I find little evidence: institutional ownership mitigates the effect of club deals by prominent PE firms on takeover premia, but only over the short term. Over the long term, institutional ownership has an overall negative effect on target returns for deals by prominent PE firms. This result might be a possible signal that prominent PE firms work closely with some institutions and it could be investigated in further research. I find partial evidence for Hypotheses 5 and 6: prominent PE firms add value to the target by affecting *ex-post* target growth, while non-prominent PE firms have a larger impact on *ex-post* target profitability. Specifically, club deals by prominent PE firms are value-adding to the target by increasing its post-buyout growth as measured by the number of assets.

When analysing the effect of bidding costs on target returns, Hypothesis 7 is not supported by the data as I find that deal value increases, instead of decreases, takeover premia over the long term in club deals by prominent PE firms as well as in sole-sponsored deals by prominent PE firms. In club deals by non-prominent PE firms, deal value increases target returns over the short term only. These findings indicate that bidding costs do not decrease target returns and therefore do not have a positive effect on takeover premium discounts. The results do not provide evidence that larger deals entail lower competition levels that negatively affect deal prices. Hypothesis 8 is supported by the data: the larger the deal, the more likely it is that a club is involved in the bidding process. This is in line also with previous literature: larger deals are pursued by larger entities (Shivdasani & Wang, 2011). Moreover, I find evidence that club formation by PE firms is more likely in the years prior to 2006, while after 2014 club formation by prominent PE firms is less likely. These results show that prominent

PE firms were more involved in club deals in the pre-2006 period and less involved in the post-2014 period. It seems therefore that the events of 2006 and 2014 deterred club deal activity by prominent PE firms.

I do not find evidence for Hypothesis 9 that lower levels of competition (i.e. fewer potential bidders) entail higher takeover premium discounts in club deals. Marquez and Singh (2013) argue that both very low and very high levels of competition are negative for the target and therefore have a nonmonotonic relationship. However, in this research study I use a linear regression model focusing on testing the part of the model by Marquez and Singh (2013) that states that low levels of competition and bidding costs negatively affect the target. Therefore, I cannot state whether I find support for the negative effect of high levels of competition on target returns as explained by Marquez and Singh (2013). Nevertheless, in the SEC filings the target would sometimes state that it preferred not to contact too many other potential acquirers, in order to avoid information leaking, especially to potential competitors. Further research could investigate this negative linear effect on target returns of high levels of competition, as measured by the number of indications of interest sent.

Furthermore, results show that target-initiated club deals have a larger takeover premium discount, paying on average 45% less than acquirer-initiated deals over the long term. This finding indicates that target-initiated club deals put targets in a worse bargaining position with the acquirer and is in line with previous literature (Aktas, Bodt, & Roll, 2010; Masulis & Simsir, 2018). I also find evidence that including a go-shop period in the bidding process increases target returns over the short term. As a go-shop period is often included when the bidding process is acquirer-initiated and it could be used by target firms as a protection from low levels of competition. However, in the SEC filings analysed, I did not find a single instance of one of the acquiring parties coming from the go-shop period, which could also be an interesting topic for further research. It could be possible that there is some collusive behaviour, that other bidders are disincentivised to bid as they are scared off by the consortium, or that targets prefer not to switch to new acquirers after having already worked through an initial possible deal. Finally, Hypothesis 10 is not supported by the data, which is in line with the previous findings by Boone and Mulherin (2011). Competition levels are not affected by club deals by prominent PE firms. Furthermore, in the years before 2006 there was more competition among prominent PE firms in club deals, while after 2014 competition was lower. This finding indicates that over time PE club deal activity and club formation has decreased, possibly due to concerns following the inquiry by the DoJ and the settling of the lawsuit against some of the largest PE firms in 2014.

In conclusion, even though I find that club deals by prominent PE firms pay 24% lower takeover premia than sole-sponsored deals by prominent PE firms, I do not find evidence leading to think that this effect might be driven by collusive behaviour. Instead, results seem to point in the direction that it is more likely that club deals obtain a discount on takeover premia due to competition rules and auction settings, and therefore act in *bona fide*. Additionally, the discount is present also over the long term only when performing the robustness check in Table 6. When analysing the full sample in Tables 4 and 5, there is no evidence of a takeover premium discount in club deals in the markup periods. In support of the beneficial effects of PE club deals, I also find that club deals by prominent PE firms are target value-adding by increasing target growth, even though non-prominent PE firms have a larger and more consistent impact on target profitability. A reason for this difference could be that prominent PE firms pursue larger and more mature firms than non-prominent PE firms. Therefore, the effect of such PE firms on target profitability might be visible after more than two years, as the new changes and strategies applied might need more time to achieve the pre-set goals given the maturity of the firm. Otherwise, it could also be that prominent PE firms have different long-term goals rather than increasing financials, such as profitability, in the first two years. Previous literature also explains that PE club deals' value creation to the target can depend on economy-wide, firm, deal and manager-specific characteristics (Achrya, Gottschalg, Hahn & Kehoe, 2013; Malenko & Malenko, 2015). Then, a case study might possibly be a better research method to investigate these possibly-colluding specific PE firms. It is also important to remember that there is no instrumental variable for collusion, which creates difficulties when testing it empirically.

I do not find support for the model by Marquez and Singh (2011): bidding costs and having fewer potential bidders in the bidding process of a club deal do not decrease takeover premia, and club deals do not affect competition levels. Results also indicate that before 2006 club deal activity was very high, while it has lowered for prominent PE firms since 2014. The pre-2006 and post-2014 periods are characterised by lower takeover premia but only over the short term: in contrast with Officer et al. (2010), I do not find evidence over the long term. Also, when it comes to institutional ownership, I do not find evidence of a mitigating effect on takeover premia of club deals by prominent PE firms over the long term. As previously mentioned, differences with the findings of Officer et al. (2010) might be due to differences in the samples used.

Nevertheless, this study reports some limitations. For instance, the SEC merger filings' sections including bidding process information are written in a different fashion for every

filing, which makes the data collection process quite inefficient. It would be useful for researchers if certain bidding process characteristics, such as the number of bidders involved, contacted, that signed confidentiality agreements or that send a non-binding offer, would be easily accessible and in a standard format. Given that this data collection process is extremely time consuming, it hinders research over a limited time period. Moreover, time constraints and external factors such as the Covid-19 pandemic also hindered the research process. It would also be useful for academics to have a list of prominent PE firms available for every year, as the lack of it might create distorted results. The PEI magazine could store the lists of the previous years in an archive: in this way, researchers would know the prominent PE firms for every year, leading to more accurate findings.

In this paper I researched the effect of club deals by prominent PE firms on takeover premia, competition levels and target performance. Further research could investigate the effect of club deals on competition levels by also including in the sample of analysis information regarding the bidding process of M&A deals and sole-sponsored PE deals. Moreover, in order to have a complete overview of the effect of club deals on target returns, investigating all club deals and not only PE club deals might bring new insights, as PE firms might club with other financial entities such as hedge funds or pension funds. The negative effect of institutional ownership on target returns over the long term could also be researched further, as it might provide a better understanding of the relationship between institutions and the market for corporate control. Finally, further research could investigate how the market for corporate control has changed from the 1984-2006 period, after which there is a decrease of club deal activity: are regulations better implemented nowadays and are anticompetitive effects easier to identify?

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Appendix A Abbreviations

Table A Abbreviations

In this table, the abbreviations used in this research paper are listed, with their meaning and description.

Abbreviation	Meaning	Description
M&A	Mergers and Acquisitions	Practice of corporate restructuring and development.
PE	Private Equity	Firms and/or funds that invest using private equity.
DoJ	Department of Justice	Department of Justice of the United States.
PEI	Private Equity International	Magazine about international prominent PE firms.
LBO	Leverage Buyout	Practice of buying a target to take it private and applying strategies of corporate restructuring and renewal. Normally carried out by PE firms.
SDC	Thomson Financial Securities Data Company	Database for M&A/LBO data.
CRSP	Center for Research in Security Prices	Database for daily securities data.
WRDS	Wharton Research Data Service	Database containing CRSP, Compustat and Thomson Reuters 13F. Data on daily securities, fundamentals and institutional ownership.
SEC	Security Exchange Commission	The SEC is a governmental body that enforces and regulates federal securities laws in the U.S., and it owns a database containing all exchange securities information.

Appendix B Lists of PE Firms

Table B.1 Top PE Firms by the 2019 edition of the PEI Magazine.

In this table, the top 50 PE firms in the 2019 ranking edition of the *PEI* magazine, with the respective country base (HQ) ISO codes, are listed.

Ranking	Firm Name	Country
1	Blackstone	US
2	The Carlyle Group	US
3	KKR	US
4	CVC Capital Partners	UK
5	Warburg Pincus	US
6	Bain Capital	US
7	EQT	SE
8	Thoma Bravo	US
9	Apollo Global Management	US
10	Neuberger Berman Group	US
11	Hellman & Friedman	US
12	TPG	US
13	EnCap Investments	US
14	Vista Equity Partners	US
15	Apax Partners	UK
16	General Atlantic	US
17	Clayton, Dubilier, & Rice	US
18	Permira Advisers	UK
19	Advent International	US
20	Silver Lake	US
21	Partners Group	CH
22	Stone Point Capital	US
23	Bridgepoint	UK
24	Brookfield Asset Management	CA
25	Onex	CA
26	BC Partners	UK
27	Genstar Capital	US
28	PAI Partners	FR
29	Hillhouse Capital Group	HK
30	Leonard Green & Partners	US
31	Insight Partners	US
32	American Securities	US
33	Bearing Private Equity Asia	HK
34	Cinven	UK
35	NPG Energy Capital Management	US

36	Ardian	FR
37	New Mountain Capital	US
38	Goldman Sachs Merchant Banking Division	US
39	Tiger Global Management	US
40	Quantum Energy Partners	US
41	PAG	HK
42	Riverstone Holdings	US
43	L Catterton	US
44	Affinity Equity Partners	HK
45	HarbourVest Partners	US
46	GTCR	US
47	Roark Capital Group	US
48	Eurazeo	FR
49	Ares Management	US
50	Adams Street Partners	US

Table B.2 Top PE firms – Officer et al. (2010) list.

In this table, the top PE firms in the 2007 ranking edition of the *PEI* magazine and ranked by number of deals are listed.

Rank by N. Deals	Firm Name	Rank PEI 2007
1	Kohlberg Kravis Roberts	2
2	The Blackstone Group	4
3	TPG	5
4	Goldman Sachs Principal Investment Area	3
5	Welsh, Carson, Anderson & Stowe (WCAS)	42
6	Apollo Management	12
7	Morgan Stanley	...
8	Merrill Lynch	...
9	Thomas H. Lee Partners	30
10	The Carlyle Group	31
11	Forstmann Little	1
12	Leonard Green & Partners	...
13	Bain Capital	8
14	Madison Dearborn Partners	...
15	HM Capital Partners (formerly Hicks, Muse, Tate, and Furst)	32
16	Warburg Pincus	14
17	Providence Equity Partners	9
18	Clayton, Dubilier & Rice	47
19	Lehman Brothers Private Equity	25

20	Silver Lake Partners	19
21	Hellman & Friedman	16
22	JP Morgan (including Chase Capital Partners)	...
23	Fortress Investment Group	27
24	Cerberus Capital Management	34
25	GTCR Golder Rauner	44
26	Berkshire Partners	40
27	Onex	33
28	Sun Capital Partners	28
29	TA Associates	39
30	BC Partners	29
31	EQT Partners	21
32	Pacific Equity Partners	41
33	Permira	6

Table B.3 Top PE Firms by the 2020 edition of the PEI Magazine.

In this table, the PE firms ranked at the positions 50th-100th in the 2020 ranking edition of the *PEI* magazine, with the respective country base (HQ) ISO codes, are listed.

Ranking	Firm Name	Country
51	Veritas Capital	US
52	Tiger Global Management	US
53	Summit Partners	US
54	Madison Dearborn Partners	US
55	Adams Street Partners	US
56	AEA Investors	US
57	Onex	CA
58	Sequoia Capital	US
59	Oaktree Capital Management	US
60	HarbourVest Partners	US
61	Roark Capital Group	US
62	Investindustrial	UK
63	Providence Equity Partners	US
64	Astorg Partners	FR
65	Welsh, Carson, Anderson & Stowe	US
66	CPE	CHN
67	New Enterprise Associates	US
68	Audax Group	US
69	KPS Capital Partners	US
70	Energy Capital Partners	US
71	Triton Partners	UK

72	Morgan Stanley Investment Management	US
73	Lindsay Goldberg	US
74	New Mountain Capital	US
75	IK Investment Partners	UK
76	TSG Consumer Partners	US
77	Oak Hill Capital Partners	US
78	Andreessen Horowitz	US
79	Affinity Equity Partners	HK
80	Kelso & Company	US
81	Harvest Partners	US
82	CDH Investments	HK
83	Castle Lake	US
84	China Everbright Limited	HK
85	Berkshire Partners	US
86	Thomas H. Lee Partners	US
87	TDR Capital	UK
88	Hg Cerberus Capital Management	UK US
89	Sycamore Partners	US
90	GCM Grosvenor	US
91	Accel	US
92	Montagu Private Equity	UK
93	GTCR	US
94	CITIC Capital	HK
95	Great Hill Partners	US
96	Equistone Partners Europe	UK
97	Hamilton Lane	HK
98	TCV	US
99	KSL Capital Partners	US
100		

Appendix C Variables Definition

Table C Variables definition.

In this table, all the variables used in this research study are defined. Variables are also divided into sub-groups: Sample Indicators, Returns and Performance Proxies Variables, Target Characteristics, Deal Characteristics, Measures of Competition Level, and Bidding Process Characteristics. Data is obtained from SDC, CRSP, Compustat, Thomson Financials 13F Holdings and the SEC merger filings.

Variable	Definition
<i>Sample Indicators</i>	
Club	Dummy variable: it equals 1 if the deal was made by a consortium of prominent PE firms, and 0 otherwise. Information is retrieved from SDC and the Top 50 of the 2019 ranking edition of the PEI magazine.
Sole PE	Dummy variable: it equals 1 if the deals was made by a single prominent PE firm (sole-sponsored), and 0 otherwise. Information is retrieved from SDC and the Top 50 of the 2019 ranking edition of the PEI magazine.
PE Firm	Dummy variable: it equals 1 if the deal was made by a non-prominent PE firm. Information is retrieved from SDC.
NClub	Dummy variable: it equals 1 if the deal was a club deal and it was made by a non-prominent PE firm. Information is retrieved from SDC.
Other Private	Dummy variable: it equals 1 if the deal was made by a private acquirer and 0 if it was made by a public acquirer. It includes non-prominent PE firms and excludes prominent PE firms. Information is retrieved from SDC.
<i>Returns and Performance Proxies Variables</i>	
Raw returns	Raw target returns, from CRSP.
BHAR	Buy-and-hold abnormal returns. Estimation window (-379, -127). Data is obtained from CRSP.

CAR	Cumulative abnormal returns. Event window (-1,1). Data is obtained from CRSP.
Runup Markup Premium	<i>Ex-ante</i> deal announcement period (-42, -1). <i>Ex-post</i> deal announcement period (0, 126). Around deal announcement period (-42, 126).
Profitability	Target's profitability. Computed as EBITDA divided by total assets. EBITDA stands for: Earnings Before Interest Taxes Depreciation and Amortisation. Data is obtained from CRSP and Compustat.
Growth _a	First measure of target's levels of growth. Measured by taking the natural logarithm of the target's total assets: $\ln(\text{Total Assets})$. Data is obtained from CRSP and Compustat.
Growth _b	Second measure of target's levels of growth. Measured by taking the natural logarithm of the number of employees: $\ln(\text{Employees})$. Data is obtained from CRSP and Compustat.

Target Characteristics

Size	Target's size. Measured by target market capitalisation 43 days prior date of announcement. Data is obtained from CRSP and Compustat.
Tobin's Q	Market value of the target's assets divided by book value of assets. Data is obtained from CRSP and Compustat.
EBITDA/Assets	EBITDA (Earnings Before Interest Taxes Depreciation and Amortisation) divided by total assets. Data is obtained from CRSP and Compustat.
Leverage	Book value of debt divided by the sum of book value of debt and market value of equity (Debt/Debt + Equity). Data is obtained from CRSP and Compustat.
Institutional Ownership	Fraction of each firm's outstanding shares owned by all institutions. Information is retrieved from Thomson Financials 13F Holdings database.

Prior 12-month BHAR	BHAR for the 12 months prior the year of the date of announcement. Data is obtained from CRSP.
Prior 12-month Volatility	Standard deviation of target's daily returns for the 12 months prior the year of the date of announcement. Data is obtained from CRSP.

Deal Characteristics

Deal Value	Total transaction value, obtained from SDC.
Diversify	Dummy variable: it equals 1 if the target is of a different industry than the acquirer (by looking at SIC-codes) and 0 otherwise. Information is retrieved from SDC.
Hostile	Dummy variable: it equals 1 if the transaction was hostile and 0 if friendly. Information is retrieved from SDC.
Tender	Dummy variable: it equals 1 if the transaction was a tender offer and 0 otherwise. Information is retrieved from SDC.
Defence	Dummy variable: it equals 1 if the target used any defensive strategies and 0 otherwise. Information is retrieved from SDC.
All Cash	Dummy variable: it equals 1 if the transaction was cash only and 0 if it was only stock or a mix of stock and cash. Information is retrieved from SDC.
Days	Difference in days between date of announcement and date of effective completion of the transaction. Information is retrieved from SDC.

Measures of Competition Level

Indication of Interest	Number of firms that sent an indication of interest (i.e. a non-binding offer) during the bidding process. Used as a proxy for the number of potential bidders. Information is obtained from the SEC merger filings.
Contact	Number of firms that were in contact with the target during the bidding process.

Confidentiality	Information is obtained from the SEC merger filings. Number of firms that entered into a confidentiality agreement with the target during the bidding process. Information is obtained from the SEC merger filings.
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Bidding Process Characteristics

Target Initiated	Indicator variable that equals 1 if the target initiated the bidding process/had first the idea of being taken over, and equal to 0 if otherwise. Information is obtained from the SEC merger filings.
Go Shop	Indicator variable that equals 1 if there was a go-shop period during the overall bidding process, and equal to 0 if otherwise. Information is obtained from the SEC merger filings.

Appendix D SEC Merger Filings Data

Table D.1 Target SEC merger filings data: bidding process characteristics and competition level measures.

In this table information for each target acquired by a private equity consortium regarding bidding process characteristics and competition levels is reported. Date Announced is the date on which the completed deal was publicly announced, while Date Effective is the date on which the deal was implemented. Ticker is the firm identifier. The other variables are defined in Section 2 as well as in Table C of Appendix C. Information is retrieved through a text-search from the SEC merger filings (database EDGAR) of the targets, and when unavailable from the acquirer filings or from the SDC deal synopses.

Target Name	Ticker	Date of Announcement	Date Effective	Sample ID	Ind. Of Interest	Contact	Confidentiality	Contact – Go Shop	Confidentiality – Go Shop	Ind. of Interest – Go Shop	Target Initiated	Go Shop
Dun & Bradstreet Corp	DNB	08/08/2018	08/02/2019	Club	4	8	8	57	3	0	1	0
CommerceHub Inc	CHUBA	06/03/2018	21/05/2018	Club	6	16	7	0		0	1	0
Blue Nile Inc	NILE	07/11/2016	17/02/2017	Club	2	19	12	31	6	0	0	1
Rackspace Hosting Inc	RAX	26/08/2016	03/11/2016	Club	4	5	5	0	0	0	1	0
SolarWinds Inc	SWI	21/10/2015	05/02/2016	Club	5	14	5	0	0	0	0	0
Life Time Fitness Inc	LTM	16/03/2015	10/06/2015	Club	4	19	11	0	0	0	1	0
Riverbed Technology Inc	RVBD	15/12/2014	24/04/2015	Club	7	8	7	0	0	0	0	0
BMC Software Inc	BMC	06/05/2013	10/09/2013	Club	5	14	6	16	2	0	1	0
Duff & Phelps Corp	DUF	30/12/2012	23/04/2013	Club	4	4	4	27	5	0	0	1
Knight Capital Group Inc	KCG	06/08/2012	06/08/2012	Club	3	3	3	0	0	0	0	0
Blue Coat Systems Inc	BCSI	09/12/2011	15/02/2012	Club	5	33	14	0	0	0	0	0
Pharmaceutical Prod Dvlp Inc	PPDI	03/10/2011	05/12/2011	Club	5	11	4	23	1	0	0	1
J Crew Group Inc	JCG	23/11/2010	07/03/2011	Club	3	3	3	58	3	0	0	1
Waste Industries USA Inc	WWIN	23/10/2007	09/05/2008	Club	3	18	11	0	0	0	1	0
Avaya Inc	AV	04/06/2007	26/10/2007	Club	6	13	8	36	4	0	0	1
Alltel Corp	AT	20/05/2007	16/11/2007	Club	6	9	9	0	0	0	1	0
ADESA Inc	KAR	22/12/2006	20/04/2007	Club	11	19	12	0	0	0	0	0
Readers Digest Association Inc	RDB	16/11/2006	02/03/2007	Club	4	7	6	0	0	0	0	0
OSI Restaurant Partners Inc	OSI	06/11/2006	14/06/2007	Club	4	4	4	18	2	0	0	1
HCA Inc	HCA	24/07/2006	17/11/2006	Club	3	3	3	23	0	0	1	1
Michaels Stores Inc	MIKE	30/06/2006	31/10/2006	Club	6	37	13	0	0	0	1	0
Univision Communications Inc	UVN	27/06/2006	29/03/2007	Club	11	57	29	0	0	0	1	0
ARAMARK Corp	RMK	01/05/2006	26/01/2007	Club	4	8	7	0	0	0	1	0

Target Name	Ticker	Date of Announcement	Date Effective	Sample ID	Ind. Of Interest	Contact	Confidentiality	Contact - Go Shop	Confidentiality - Go Shop	Ind. of Interest - Go Shop	Target Initiated	Go Shop
Education Management Corp	EDMC	06/03/2006	01/06/2006	Club	10	10	10	0	0	0	0	0
Neiman Marcus Group Inc	NMG.A	02/05/2005	06/10/2005	Club	8	9	8	0	0	0	1	0
SunGard Data Systems Inc	SDS	28/03/2005	11/08/2005	Club	5	9	7	0	0	0	0	0
Toys R Us Inc	TOY	17/03/2005	21/07/2005	Club	12	33	25	0	0	0	1	0
Texas Genco Holdings Inc	TGN	21/07/2004	13/04/2005	Club	10	107	38	0	0	0	1	0
Panamsat Corp	SPOT	20/04/2004	20/08/2004	Club	13	33	24	0	0	0	1	0
Centennial Cellular Corp	CYCL	02/07/1998	08/01/1999	Club	12	114	56	0	0	0	1	0
Regal Cinemas Inc	REGL	20/01/1998	27/05/1998	Club	5	18	6	0	0	0	0	0
RAM Energy Resources Inc	RAME	22/12/2011	08/02/2012	Club	17	81	21	0	0	0	1	0
Del Monte Foods Co	DLM	25/11/2010	08/03/2011	Club	5		6	53	2	0	0	0
Interactive Data Corp	IDC	04/05/2010	29/07/2010	Club	11	38	25	0	0	0	0	0
BankUnited Financial Corp,FL	BKUNA	21/05/2009	19/06/2009	Club	8						1	
Biomet Inc	BMET	12/07/2007	25/09/2007	Club	6	6	7	0	0	0	1	0
Dollar General Corp	DG	11/03/2007	06/07/2007	Club	4	4	4	0	0	0	0	0
TXU Corp	TXU	26/02/2007	10/10/2007	Club	2	2	2	70	10	0	0	1
Central Parking Corp	CPC	20/02/2007	22/05/2007	Club	23	71	23	0	0	0	1	0
Laureate Education Inc	LAUR	28/01/2007	20/07/2007	Club	27	39	25	67	2	4	1	1
Biomet Inc	BMET	18/12/2006	11/07/2007	Club	5	4	3	0	0	0	1	0
Clear Channel Commun Inc	CCU	16/11/2006	30/07/2008	Club	5	8	1	22	0	0	0	1
Harrah's Entertainment Inc	HET	02/10/2006	28/01/2008	Club	6	31	3	27	0	0	0	1
Freescale Semiconductor Inc	FSL	15/09/2006	01/12/2006	Club	8	2	8	6	0	0	0	1
Intergraph Corp	INGR	31/08/2006	29/11/2006	Club	6	22	17	0	0	0	1	0
Petco Animal Supplies Inc	PETC	14/07/2006	26/10/2006	Club	3	1	4	56	0	0	0	1
West Corp	WSTC	31/05/2006	24/10/2006	Club	4	23	8	27	4	0	1	1
Linens n Things Inc	LIN	08/11/2005	03/02/2006	Club	7	9	5	0	0	0	1	0
UCI	UCI	15/09/2005	05/04/2006	Club	7	11	10	0	0	0	1	0
DoubleClick Inc	DLCK	25/04/2005	13/07/2005	Club	22	72	52	0	0	0	1	0

Target Name	Ticker	Date of Announcement	Date Effective	Sample ID	Ind. Of Interest	Contact	Confidentiality	Contact - Go Shop	Confidentiality - Go Shop	Ind. of Interest - Go Shop	Target Initiated	Go Shop
Metro-Goldwyn-Mayer Inc	MGM	13/09/2004	08/04/2005	Club	4	4	3	0	0	0	0	0
Williams Energy Partners LP	WEG	21/04/2003	17/06/2003	Club	3	3	3	0	0	0	1	0
Seabulk International Inc	SBLK	13/06/2002	13/09/2002	Club	3	3	3	0	0		0	
Petco Animal Supplies Inc	PETC	17/05/2000	02/10/2000	Club	4	3	4	0	0	0	0	0
Veterinary Centers of America	VCAI	31/03/2000	20/09/2000	Club	1	0	0	0	0	0	0	0
Wilmar Industries Inc	WLMR	23/12/1999	16/05/2000	Club	2	7	2	0	0	0	1	0
Genesis Health Ventures Inc	GHV	04/08/1999	15/11/1999	Club	3	3	3					
Big Flower Holdings Inc	BGF	28/06/1999	07/12/1999	Club	2	31	7	0	0	0	1	0
Integrated Circuit Systems Inc	ICST	20/01/1999	04/12/1999	Club	2	17	8	0	0	0	1	0
Republic Engineered Steels	REPS	07/07/1998	21/09/1998	Club	4	5	4	0	0	0	0	0
Telemundo Group Inc	TLMD	19/11/1997	12/08/1998	Club	12	22	20	0	0	0	1	0
Fisher Scientific Intl Inc	FSH	07/08/1997	21/01/1998	Club	6	53	11	0	0	0	1	0
Leslie's Poolmart Inc	LESL	12/11/1996	12/06/1997	Club	4	5	2					
Rockefeller Center Properties	RCP	12/10/1995	10/07/1996	Club	6	6	6	0	0	0	1	0
CNW Corp	CNW	06/06/1989	26/10/1989	Club	4	4	4					
Revco DS Inc	RDS	11/03/1986	29/12/1986	Club								
Denny's Inc	DEN	29/01/1984	29/01/1984	Club								
Select Medical Corp	SEM	18/10/2004	24/02/2005	Club	2	2	3	37	1	0	0	1
Topps Co Inc	TOPP	06/03/2007	12/10/2007	Club	7	13	13	107	5	0	1	1
Brookdale Living Communities	BLCI	27/07/2000	13/09/2000	Club	2	0	0	0	0	0	0	0
Albertsons Inc	ABS	20/01/2006	02/06/2006	Club	13	17	15	0	0	0	1	0
ShopKo Stores Inc	SKO	03/10/2005	28/12/2005	Club	5	12	11	0	0	0	1	0
Physicians Specialty Corp	ENTS	14/06/1999	02/11/1999	Club	4	11	9	0	0	0	1	0
PetSmart Inc	PETM	14/12/2014	11/03/2015	Club	10	28	15	0	0	0	1	0
Party City Corp	PCTY	27/09/2005	23/12/2005	Club	4	71	28	0	0	0	1	0
CompDent Corp	CPDN	28/07/1998	18/06/1999	Club	4	10	3	0	0	0	1	0
Verifone Systems Inc	PAY	09/04/2018	20/08/2018	NClub	2	5	4	42	4	0	1	1

Target Name	Ticker	Date of Announcement	Date Effective	Sample ID	Ind. Of Interest	Contact	Confidentiality	Contact - Go Shop	Confidentiality - Go Shop	Ind. of Interest - Go Shop	Target Initiated	Go Shop
Collective Brands Inc	PSS	01/05/2012	09/10/2012	NClub	39	138	50	0	0	0	0	0
United Western Bancorp Inc	UWBK	29/10/2010	29/10/2010	NClub	5	5	5					
Chesapeake Corp	CSKE	30/12/2008	01/05/2009	NClub								
Vertrue Inc	VTRU	22/03/2007	16/08/2007	NClub	9	17	15	20	0	0	0	1
Educate Inc	EEEE	25/09/2006	14/06/2007	NClub	7	29	9	0	0	0	0	0
Peach Holdings Inc	PSF	01/09/2006	21/11/2006	NClub								
Goody's Family Clothing Inc	GDYS	11/10/2005	27/01/2006	NClub	7	17	13	0	0	0	1	0
NTELOS Holdings Corp	NTLS	18/01/2005	02/05/2005	NClub								
LogistiCare Inc	LGTC	28/05/2004	28/05/2004	NClub								
Garden Fresh Restaurant Corp	LTUS	30/09/2003	10/03/2004	NClub	6	42	5	0	0	0	1	0
Jenny Craig Inc	JCGI	28/01/2002	14/05/2002	NClub	13	160	62	0	0	0	1	0
VICORP Restaurants Inc	VRES	15/02/2001	14/05/2001	NClub	4	34	17	0	0	0	1	0
Michael Foods Inc	MIKL	22/12/2000	10/04/2001	NClub	8	61	32	0	0	0	1	0
CB Richard Ellis Services Inc	CBG	13/11/2000	20/07/2001	NClub	2	35	2	0	0	0	0	0
Sunrise Medical Inc	SMD	17/10/2000	13/12/2000	NClub	3	10	2	0	0	0	1	0
MascoTech Inc	MSX	02/08/2000	28/11/2000	NClub	8	16	7	0	0	0	1	0
Buffets Inc	BOCB	05/06/2000	28/09/2000	NClub	8	88	37	0	0	0	1	0
Houlihans Restaurant Group	HOAL	01/05/1998	07/07/1998	NClub								
Day International Group Inc	DAYI	21/01/1998	21/01/1998	NClub								
Outboard Marine Corp	OM	07/08/1997	30/09/1997	NClub								
Acordia Inc	ACO	21/05/1997	02/09/1997	NClub	4	4					1	
Grand Union Co	GDUN	31/07/1996	17/09/1996	NClub	2	2						
Sterling Chemicals Inc	SCHI	25/04/1996	01/10/1996	NClub	11	15	9	0	0	0	0	0
La Petite Academy(Vestar/LPA)	LPAI	06/11/1992	23/07/1993	NClub	2	2					1	
Allegheny International Inc	AG	16/06/1989	30/09/1990	NClub	3	3						
Research Cottrell Inc	RC	08/06/1987	13/07/1987	NClub	3	3						
Leaseway Transportation Corp	LTC	13/11/1986	25/06/1987	NClub	4	4						
HJ Heinz Co	HNZ	14/02/2013	07/06/2013	NClub	2	2	2	0	0	0	0	0
SCOA Industries Inc	SOA	01/07/1985	10/12/1985	NClub	3	3						

Table D.2 Searching criteria in SEC merger filings.

In this table, the keywords, SEC forms and sections in SEC filings used and read in order to find information regarding the bidding process of club deals are reported.

Keywords
<i>potential</i>
<i>potential acquirer</i>
<i>potential bidder</i>
<i>potential financial acquirer</i>
<i>potential financial bidder</i>
<i>go-shop</i>
<i>indication of interest</i>
<i>indications of interest</i>
<i>non-binding offer</i>
<i>confidential</i>
<i>contact</i>
<i>confidentiality agreement</i>
<i>non-public</i>

SEC Forms
DEF 14A
PRE 14A
DEFM14A
PREM14A
DEF 14C
DEFM14C
S-4
S-4/A
DEFS14A
PRES14A
SC 14D9

Sections in SEC Filings
Background of the Merger
Background of the Offer
Background of the Transaction

Appendix E Club Deals

Table E Club deals by prominent and non-prominent PE firms.

In this table, the targets taken over by PE consortia over the period 1984-2019 are reported. Date Announced is the date on which the completed deal was publicly announced, while Date Effective is the date on which the deal was implemented. Ticker is the firm identifier. Club indicates club deals by prominent PE firms, while NClub indicates club deals by non-prominent PE firms. Prominent PE firms are defined in Section 3 and listed in Table B.1 and B.2 of Appendix B. Data is retrieved from SDC.

Target Name	Ticker	Date Announced	Date Effective	Acquirer Short Business Description	Club Deal Type
Dun & Bradstreet Corp	DNB	08/08/2018	08/02/2019	Investor group	Club
CommerceHub Inc	CHUBA	06/03/2018	21/05/2018	Other Financial Vehicles	Club
Blue Nile Inc	NILE	07/11/2016	17/02/2017	Other Financial Vehicles	Club
Rackspace Hosting Inc	RAX	26/08/2016	03/11/2016	Other Financial Vehicles	Club
SolarWinds Inc	SWI	21/10/2015	05/02/2016	Special purpose acq vehicle	Club
Life Time Fitness Inc	LTM	16/03/2015	10/06/2015	Other Financial Vehicles	Club
Riverbed Technology Inc	RVBD	15/12/2014	24/04/2015	Other Financial Vehicles	Club
BMC Software Inc	BMC	06/05/2013	10/09/2013	Special purpose acq vehicle	Club
Duff & Phelps Corp	DUF	30/12/2012	23/04/2013	Special purpose acq vehicle	Club
Knight Capital Group Inc	KCG	06/08/2012	06/08/2012	Investor group	Club
RAM Energy Resources Inc	RAME	22/12/2011	08/02/2012	Investor group	Club
Blue Coat Systems Inc	BCSI	09/12/2011	15/02/2012	Special purpose acq vehicle	Club
Pharmaceutical Prod Dvlp Inc	PPDI	03/10/2011	05/12/2011	Special purpose acq vehicle	Club
Del Monte Foods Co	DLM	25/11/2010	08/03/2011	Investor group	Club
J Crew Group Inc	JCG	23/11/2010	07/03/2011	Special purpose acq vehicle	Club
Interactive Data Corp	IDC	04/05/2010	29/07/2010	Special purpose acq vehicle	Club
BankUnited Financial Corp,FL	BKUNA	21/05/2009	19/06/2009	Investor group	Club
Waste Industries USA Inc	WWIN	23/10/2007	09/05/2008	Investor group	Club
Biomet Inc	BMET	12/07/2007	25/09/2007	Manufacture surgical products	Club
Avaya Inc	AV	04/06/2007	26/10/2007	Special purpose acq vehicle	Club
Alltel Corp	AT	20/05/2007	16/11/2007	Special purpose acq vehicle	Club
Dollar General Corp	DG	11/03/2007	06/07/2007	Special purpose acq vehicle	Club
TXU Corp	TXU	26/02/2007	10/10/2007	Special purpose acq vehicle	Club
Central Parking Corp	CPC	20/02/2007	22/05/2007	Special purpose acq co	Club
Laureate Education Inc	LAUR	28/01/2007	20/07/2007	Investor group	Club

ADESA Inc	KAR	22/12/2006	20/04/2007	Special purpose acq vehicle	Club
Biomet Inc	BMET	18/12/2006	11/07/2007	Manufacture surgical products	Club
Clear Channel Commun Inc	CCU	16/11/2006	30/07/2008	Special purpose acq vehicle	Club
Readers Digest Association Inc	RDB	16/11/2006	02/03/2007	Investor group	Club
OSI Restaurant Partners Inc	OSI	06/11/2006	14/06/2007	Special purpose acq vehicle	Club
Harrah's Entertainment Inc	HET	02/10/2006	28/01/2008	Investor group	Club
Freescale Semiconductor Inc	FSL	15/09/2006	01/12/2006	Special purpose acq vehicle	Club
Intergraph Corp	INGR	31/08/2006	29/11/2006	Special purpose acq vehicle	Club
HCA Inc	HCA	24/07/2006	17/11/2006	Special purpose acq vehicle	Club
Petco Animal Supplies Inc	PETC	14/07/2006	26/10/2006	Special purpose acq vehicle	Club
Michaels Stores Inc	MIKE	30/06/2006	31/10/2006	Special purpose acq vehicle	Club
Univision Communications Inc	UVN	27/06/2006	29/03/2007	Special purpose acq vehicle	Club
West Corp	WSTC	31/05/2006	24/10/2006	Investor group	Club
ARAMARK Corp	RMK	01/05/2006	26/01/2007	Investor group	Club
Education Management Corp	EDMC	06/03/2006	01/06/2006	Special purpose acq vehicle	Club
Linens n Things Inc	LIN	08/11/2005	03/02/2006	Investor group	Club
UICI	UCI	15/09/2005	05/04/2006	Investor group	Club
Neiman Marcus Group Inc	NMG.A	02/05/2005	06/10/2005	Investor group	Club
DoubleClick Inc	DCLK	25/04/2005	13/07/2005	Investor group	Club
SunGard Data Systems Inc	SDS	28/03/2005	11/08/2005	Investor group	Club
Toys R Us Inc	TOY	17/03/2005	21/07/2005	Investor group	Club
Metro-Goldwyn-Mayer Inc	MGM	13/09/2004	08/04/2005	Acq vehicle co	Club
Texas Genco Holdings Inc	TGN	21/07/2004	13/04/2005	Investor group	Club
Panamsat Corp	SPOT	20/04/2004	20/08/2004	Investor group	Club
Williams Energy Partners LP	WEG	21/04/2003	17/06/2003	Investor group	Club
Seabulk International Inc	SBLK	13/06/2002	13/09/2002	Investor group	Club
Petco Animal Supplies Inc	PETC	17/05/2000	02/10/2000	Investor group	Club
Veterinary Centers of America	VCAI	31/03/2000	20/09/2000	Investor group	Club
Wilmar Industries Inc	WLMR	23/12/1999	16/05/2000	Investor group	Club
Genesis Health Ventures Inc	GHV	04/08/1999	15/11/1999	Investor group	Club
Big Flower Holdings Inc	BGF	28/06/1999	07/12/1999	Investor group	Club
Integrated Circuit Systems Inc	ICST	20/01/1999	04/12/1999	Investor group	Club
Republic Engineered Steels	REPS	07/07/1998	21/09/1998	Investor group	Club
Centennial Cellular Corp	CYCL	02/07/1998	08/01/1999	Investor group	Club

Regal Cinemas Inc	REGL	20/01/1998	27/05/1998	Investor group	Club
Telemundo Group Inc	TLMD	19/11/1997	12/08/1998	Investor group	Club
Fisher Scientific Intl Inc	FSH	07/08/1997	21/01/1998	Investor group	Club
Leslie's Poolmart Inc	LESL	12/11/1996	12/06/1997	Investor group	Club
Rockefeller Center Properties	RCP	12/10/1995	10/07/1996	Investor group	Club
CNW Corp	CNW	06/06/1989	26/10/1989	Investor group	Club
Revco DS Inc	RDS	11/03/1986	29/12/1986	Investor group	Club
Select Medical Corp	SEM	18/10/2004	24/02/2005	Invest hldg co	Club
Topps Co Inc	TOPP	06/03/2007	12/10/2007	Investor group	Club
Brookdale Living Communities	BLCI	27/07/2000	13/09/2000	Special purpose acq vehicle	Club
Albertsons Inc	ABS	20/01/2006	02/06/2006	Special purpose acq vehicle	Club
ShopKo Stores Inc	SKO	03/10/2005	28/12/2005	Investor group	Club
Physicians Specialty Corp	ENTS	14/06/1999	02/11/1999	Private equity firm	Club
PetSmart Inc	PETM	14/12/2014	11/03/2015	Other Financial Vehicles	Club
Party City Corp	PCTY	27/09/2005	23/12/2005	Invest hldg co	Club
CompDent Corp	CPDN	28/07/1998	18/06/1999	Investor group	Club
Topps Co Inc	TOPP	06/03/2007	12/10/2007	Investor group	Club
SCOA Industries Inc	SOA	01/07/1985	10/12/1985	Department store holding co	Club
Vertrue Inc	VTRU	22/03/2007	16/08/2007	Investor group	NClub
VICORP Restaurants Inc	VRES	15/02/2001	14/05/2001	Investor group	NClub
United Western Bancorp Inc	UWBK	29/10/2010	29/10/2010	Investor group	NClub
Sunrise Medical Inc	SMD	17/10/2000	13/12/2000	Investor group	NClub
Sterling Chemicals Inc	SCHI	25/04/1996	01/10/1996	Investor group	NClub
Research Cottrell Inc	RC	08/06/1987	13/07/1987	Pvd engineering services	NClub
Collective Brands Inc	PSS	01/05/2012	09/10/2012	Special purpose acq vehicle	NClub
Peach Holdings Inc	PSF	01/09/2006	21/11/2006	Investor group	NClub
Verifone Systems Inc	PAY	09/04/2018	20/08/2018	Special Purpose Acq Vehicle	NClub
Outboard Marine Corp	OM	07/08/1997	30/09/1997	Investor group	NClub
NTELOS Holdings Corp	NTLS	18/01/2005	02/05/2005	Investor group	NClub
MascoTech Inc	MSX	02/08/2000	28/11/2000	Investor group	NClub
Michael Foods Inc	MIKL	22/12/2000	10/04/2001	Investor group	NClub
Garden Fresh Restaurant Corp	LTUS	30/09/2003	10/03/2004	Investor group	NClub
Leaseway Transportation Corp	LTC	13/11/1986	25/06/1987	Investor group	NClub
La Petite Academy(Vestiar/LPA)	LPAI	06/11/1992	23/07/1993	Investor group	NClub

LogistiCare Inc	LGTC	28/05/2004	28/05/2004	Investor group	NClub
Jenny Craig Inc	JCGI	28/01/2002	14/05/2002	Investor group	NClub
Houlihans Restaurant Group	HOAL	01/05/1998	07/07/1998	Investor group	NClub
HJ Heinz Co	HNZ	14/02/2013	07/06/2013	Other Financial Vehicles	NClub
Goody's Family Clothing Inc	GDYS	11/10/2005	27/01/2006	Blank check co	NClub
Grand Union Co	GDUN	31/07/1996	17/09/1996	Investor group	NClub
Educate Inc	EEEE	25/09/2006	14/06/2007	Investor group	NClub
Day International Group Inc	DAYI	21/01/1998	21/01/1998	Investor group	NClub
Chesapeake Corp	CSKE	30/12/2008	01/05/2009	Special purpose acq vehicle	NClub
CB Richard Ellis Services Inc	CBG	13/11/2000	20/07/2001	Investor group	NClub
Buffets Inc	BOCB	05/06/2000	28/09/2000	Investor group	NClub
Allegheny International Inc	AG	16/06/1989	30/09/1990	Investor group	NClub
Acordia Inc	ACO	21/05/1997	02/09/1997	Investor group	NClub